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Politics: Philosophy, and Economics

**Economic Planning: An Historical Perspective and its
Environmental Implications for Today**

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Alla Mia Famiglia che mi ha sempre supportato nel percorso accademico

A mio padre Francesco

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Ai miei nonni Carlo e Maretta

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Table of Contents

Chapter 1:Introduction	5
1.1 General introduction to the thesis.....	5
1.2 History	6
1.3 The Socialist Calculation Debate	7
1.4 Economic planning today	8
1.5 Environmental implications	9
Chapter 2:The Historical Precedent	12
2.1 The Genesis of planning: the USSR.....	12
2.2 The Scissors Crisis and the situation of the peasantry.....	14
2.3 A solution?	15
2.4 The Industrialization Debate.....	16
2.5 The NEP after 1925.....	20
2.6 The end of the NEP and the beginning of Stalinist planning	22
2.6.1 Debates on the planning method	23
2.6.2 Gosplan becomes the demiurge.....	25
2.7 The drafting of the first Five-Year Plan.....	26
2.8 The Nail in the coffin.....	29
Chapter 3: Failures of Central Planning	32
3.1 The Socialist Calculation Debate	32
3.2 The Attempted Reforms.....	36
3.2.1 Goulash Communism	36
3.2.2 Krushchev, the Kosygin - Liberman Reform and Ogas	38
Chapter 4: Industrial Policy	43
4.1 Definition of Economic Planning.....	43
4.2 Industrial Policy	43
4.3 The Japanese case.....	43
4.3.1 The Japanese Miracle.....	44
4.3.2 The Bureaucracy.....	45
4.3.3 The Priority Production System	46
4.3.4 The Dodge Plan, liberalization, and the birth of MITI	48

4.3.5 Finally High-Speed Growth	52
4.3.6 The Lessons of Japan.....	53
4.4 The Chinese Experience with Industrial Policy	54
4.4.1 A Little History of Price Regulation in China	54
4.4.2 China under Mao	55
4.4.3 The Market Reforms.....	58
4.4.4 The Industrial Policy of China Today	60
4.5 The Technological Prospects for Planning.....	62
Chapter 5: Environmental Implications for Today.....	64
5.1 Recent Developments	64
5.2 The Rebirth of US Industrial Policy	64
5.3 The EU and its current paradigm	68
5.3.1 Legal Basis of Industrial Policy in the Union	69
5.3.2 European Level Coordination	71
5.4 Industrial Policy Today: some Observations.....	74
Chapter 6. Conclusion.....	78
Bibliography.....	80

Chapter 1: Introduction

1.1 General introduction to the thesis

Economic planning was and still is a contentious policy proposal for many economists today, in light of the historical precedents in past socialist states like the Soviet Union and the Warsaw Pact countries and their general informational failures. With the phasing out of the command economy in China it may seem that this specific policy has nothing to contribute to the topic of economic development. But despite its past failures, it seems that some form of government control over production is getting back, especially when looking at the meteoric rise of the East Asian Economies, like South Korea and Japan or the policies that are currently being passed under the Biden presidency, (CHIPS act) and the success of industrial policy in countries such as Singapore. This new branch of economists arguing for a return to more planned approaches to economic development can also be seen by the commercial success of books such as Marianna Mazzucato's "The Entrepreneurial State" or "Capital in the 21st century" by Thomas Piketty.

The main argument of this thesis is that economic planning, implemented in a revised form industrial policy, is still useful today for fostering economic development and that it can also help us cope with climate change.

The thesis will be divided into different sections/chapters. The first deals with the rise and failure of economic planning in the Soviet Union and in the Warsaw Pact countries, from its theoretical conception from Karl Marx to the 1970's.

The second part looks at the literature of the Socialist Calculation Debate initiated by Ludwig von Mises and will identify the reasons for the failure of central planning, with specific focus on the institutional failures and the attempts to reform the soviet system in the Eastern Bloc

The third section/chapter of this work explores the different approaches that exist today dealing with economic planning, looking specifically at industrial policy in the

developing and developed world: in particular China and Korea, Japan and even specific recent policy decisions by the Biden administration.

The fourth section/chapter deals with the environmental implications of planning and industrial policy, in particular its role in accelerating the green transition towards a more sustainable and equitable economy, and the prerequisites for its effectiveness. In this section I illustrate the European Green Deal and analyse it the context of the global sustainability crisis

1.2 History

The first appearance of economic planning in the history of economic thought was Karl Marx's discussion of the society of freely independent producers¹. His Russian followers then put that idea into action by creating the first modern planned economy on planet earth in the form of the 5-year plan. The discussions that preceded the drafting of the first 5-year plan are still incredibly relevant today for the topic of economic development as they preceded many themes that will then be developed by the classical development economists, such as Domar, who admitted it himself². Big push industrialization, the problem of investment and economic growth, the problem of persistent unemployment in the traditional sector, the role that labour saving technology and foreign direct investment has in the industrialization of the country³.

Stalin's industrial revolution from 1928 to 1937 and the Feldman model that underlined its mathematical foundation were then taken as the basis for the economic development of the Warsaw Pact countries⁴. The model seemed to work until the 70's but then the accumulated problems of the command economy: unresponsiveness to consumer demand, the low quality of consumer product, the low rate of technical change, the overspending in heavy industry and the low productivity of agriculture became too

¹ Karl Marx, Capital Volume III, Marx and Engels Collected works volume 37, page 807, 2010.

² Domar, E. D., 'A Soviet model of growth' in his Essays in the Theory of Economic Growth , Oxford University Press, 1957, pp 256-57

³ Alexander Erlich, The Soviet Industrialization Debate 1924-1928, Harvard University press, page 128, 1967

⁴ Robert C. Allen, Farm to Factory a reinterpretation of the Soviet Industrial Revolution, Princeton University press, 2003

much to bear and as such the era of stagnation for the socialist economies of the Eastern Bloc began⁵⁶.

1.3 The Socialist Calculation Debate

Why did the Planned economies of the 20th century stop working? The answer may be found in the Socialist Calculation debate, an economic discussion which was initiated by the Austrian School economist Ludwig von Mises in his “Economic Calculation in the Socialist Commonwealth” and his debates with people like Otto Neurath and the various socialist economists of the Vienna Circle and beyond⁷⁸⁹¹⁰. The debate, which still continues today¹¹, has shown us many insights in explaining why planned economies may suffer from several informational, allocative, computational and institutional failures that undermine the possibility of a purely planned economy. The problems that planned economies faced during their lifespan were non-representative prices, lack of quantity¹² and quality¹³ of consumer goods and inefficient investments¹⁴ were not a mystery to the people that had to operate in them day by day, as such there were many attempts to reform the system in both the Soviet Union and Warsaw Pact countries. This thesis will also look at some of the reform attempts¹⁵¹⁶.

⁵ Ibidem

⁶ Alec Nove, *An Economic History of the USSR 1917-1991*, Penguin Books, 1992

⁷ L. von von Mises, 'Die Wirtschaftsrechnung im Sozialistischen Gemeinwesen', *Archiv für Sozialwissenschaften*, 47 (1920), translated as 'Economic Calculation in the Socialist Commonwealth', in *Collectivist Economic Planning*, ed. Hayek, George Routledge & Sons, Ltd., London, 1938

⁸ Otto Neurath, *Through War Economy to Economy in Kind*, (1919), in *Empiricism and Sociology*, by D. Reidel Publishing Company, pp 123-157, 1973

⁹ F. Hayek, 'The Uses of Knowledge in Society', *American Economic Review*, September 1945

¹⁰ O. Lange and F. Taylor, “On the Economic theory of Socialism”, edited by Benjamin E. Lippincott, University of Minesota Press, 1938

¹¹ Maxi Nieto, *Entrepreneurship and Decentralised Investment in a Planned Economy*, *Historical Materialism* 30, pp 133 - 163, 2021

¹² Schroeder, G., & Edwards, I. *Consumption in the USSR: an international comparison. Joint Economic Committee, US Government Printing Office*, 1981

¹³ Chernyshova, Natalya. "Consuming Technology in a Closed Society: Household Appliances in Soviet Urban Homes of the Brezhnev Era." *Ab Imperio*, vol. 2011 no. 2, 2011

¹⁴ Whitesell, Robert S. “Why Does the Soviet Economy Appear to Be Allocatively Efficient?” *Soviet Studies* 42, no. 2 (1990): 259–68.

¹⁵ Benjamin Peters, *How Not to Network a Nation: The Uneasy History of the Soviet Internet*, The MIT Press, 2016.

¹⁶ Paul Craig Roberts, Oskar Lange's Theory of Socialist Planning. *Journal of Political Economy*, 79(3), 562–577, 1971

1.4 Economic planning today

Despite its past failures in socialist countries, economic planning was still a popular approach to economic development especially in developing, but also in developed nation states, and it is still applied in many countries today.

This can be seen, for example, in the developmentalist policies in the East Asian economy: the Taiwanese semiconductors industry had benefitted from industrial policy and the creation of a favourable environment by being able to access specialized workers and know how¹⁷, Japan's car manufacturing sector was a product of the Bank of development of Japan and the collaboration of the Keiretsu conglomerates with the government¹⁸, and South Korea's Chaebols in many cases were directed towards sectors in which they had no interest investing but were fundamental for the state's HCI (heavy chemical industrialization) policy¹⁹. The most salient and recent case of the success of industrial policy was the rise of the People's Republic of China. What were, then, the institutional, cultural and historic causes that allowed for the development of the "Socialism with Chinese Characteristics"? This section of the chapter will analyse these points and figure out what is to be learned about the development structure of an economy following an eclectic approach²⁰. Industrial Policy can be seen as a form of planning, especially when it sets some specific targets aimed to change the productive structure of an economy, like in the overcited case of South Korean development, with its administrative sanctions and incentives aimed to develop its chemical and heavy industrial sector.

Recently there has been a return to more active government intervention in the Western World after the Covid Pandemic; governments all around the world are starting to reconsider the potential of industrial policy in fostering their manufacturing and other strategic sectors. A recent case of this is the move of the Biden administration to reinvest in manufacturing and giving preferential grants to semiconductor companies as

¹⁷ An-Chi Tung, Taiwan's Semiconductor Industry: What the State Did and Did Not, Review of Development Economics, 5(2), 266–288, 2001

¹⁸ Johnson Chalmers, MITI and the Japanese Miracle: The Growth of Industrial Policy, 1925-1975, 1982

¹⁹ Ha-Joon Chang. "The Political Economy of Industrial Policy in Korea." Cambridge Journal of Economics 17, no. 2, 131–57, 1993

²⁰ Isabella M. Weber, How China escaped Shock Therapy: The Market Reform Debate, Routledge, 2021

well as creating more resilience after the partial collapse of supply chains²¹. These types of development are also starting to be seen in other countries like the member states of the European Union, where the commission has started to “re-tool” its traditional instrument for policy-making²².

The return to industrial policy debates in the west has signed a return to a kind of logic that was seen in the 80’s with the debates on the development of industrial policy in the United States in which American economists were debating about the usefulness or even the existence of industrial policy in the East Asian economies and whether they could be used to reverse the relative industrial decline of the States²³. The context brings eerie similarities with today where industrial policy is being again discussed to recover the ground lost by American industry in technologically advanced sectors and to ensure sustainable supply chains not subject to the whims of global trade.

I conclude the section by also discussing how recent technological innovations on the informational, forecasting and computing side, in addition of favouring the private sector have boosted the feasibility of planning and industrial policy instruments.

1.5 Environmental implications

The last part of the thesis deals with the current climate crisis: equipped with the baggage from the previous parts I will look at the current policies being implemented in the to facilitate the green transition and the programs that have been put in place to foster green growth worldwide²⁴. I also explore the limits of the green growth paradigm and show how current environmental efforts, without proactive government interventions, will not be able to curb down emissions fast enough to honour the Paris Agreement on climate change and to keep temperature below acceptable levels. For many scholars the extent of economic mobilization required to contain the earth

²¹ Barry Eichengreen, Industrial policy is back – should we welcome government intervention? The Guardian, Mon 9 Oct 2023.

²² Donato Di Carlo & Luuk Schmitz, Europe first? The rise of EU industrial policy promoting and protecting the single market, Journal of European Public Policy, 30:10, 2063-2096, 2023

²³ Antonio Andreoni, Ha-Joon Chang, The political economy of industrial policy: Structural interdependencies, policy alignment and conflict management, Structural Change and Economic Dynamics, Volume 48, 2019, Pages 136-150,

²⁴ Jefim Vogel & Jason Hickel, Is green growth happening? An empirical analysis of achieved versus Paris-compliant CO₂-GDP decoupling in high-income countries, Lancet Planet Health 7, 759 -769. 2023

temperatures increase will have to be either equal or superior to the mobilization experienced during the Second World War²⁵. And such an effort can only happen with major coordination and support from the governments and a relevant involvement of the states in planning, subsidising, promoting and controlling the commanding heights of the economy by a combination of incentives and more direct “command and control” mechanisms aimed at changing the productive structure of the economy. Examples of both approaches can be seen in the case of the European Union, where through directives, like the recently proposed one on the banning of production of internal combustion engines cars by 2035²⁶. The Union wishes to change not only the productive structure, but also the behaviour of consumers as energy users. The use of incentives and other tools of industrial policy can also be seen with the “derisking” strategy employed by the EU to shape the environmental of its constituent countries²⁷²⁸.

I will also make the case that, especially in advanced countries, planning and industrial policy are a necessary step in order to change the technological structure of the economy from a carbon intensive one into a carbon-neutral/negative one. The nature of future technological innovation is dependent on previous iterations, and as such path dependency²⁹, the same argument could be made for the underlying reliance of the economies of today on fossil fuel technologies, a characteristic that developed at the beginnings of capitalism in England³⁰. In light of this fact the role of the state ,as a director of the shape of technology, should be revalued, since it is the institution that can make costly, highly demanding, and uncertain investments in technologies that the

²⁵ Joseph Stiglitz, The climate crisis is our third world war. It needs a bold response, The Guardian, 4th June 2019

²⁶ European Parliament, EU ban on the sale of new petrol and diesel cars from 2035 explained, 3rd November 2022

²⁷ Marianna Mazzucato, Mission Economy: A Moonshot Guide to Changing Capitalism, HarperCollins Publishers, 2021

²⁸ Daniela Gabor, The (European) derisking state, in "Stato e mercato, Rivista quadrimestrale" 1/2023, pp. 53-84,

²⁹ GREVE, HENRICH R., and MARC-DAVID L. SEIDEL. “THE THIN RED LINE BETWEEN SUCCESS AND FAILURE: PATH DEPENDENCE IN THE DIFFUSION OF INNOVATIVE PRODUCTION TECHNOLOGIES. Strategic Management Journal, vol. 36, no. 4, 2015, pp. 475–96.

³⁰ Andreas Malm, The Origins of Fossil Capital: From Water to Steam in the British Cotton Industry, Historical Materialism 21.1, 15–68, 2013

private sector has no interest in making, and then direct the market towards the adoption of said technological developments, as Marianna Mazzucato made clear in her work³¹.

Another element in which state action could be useful is in changing consumer behaviour³², combined with changing marketing prerogatives by part of the private sector³³. The combination of this two has a role to play in the struggle for a sustainable mode of living and to reduce behavioural inertia of consumers.

The solution to the climate crisis needs specific, targeted, and well-informed interventions that up until now have been relegated to the dustbin due to, in many cases, ideological convenience or a priori distrust in its merits, as such there needs to be a rectification, for the current social and economic challenges to be addressed in a way that results in a transition which deals with both the political and economic requirements of both consumers and firms.

³¹ Marianna Mazzucato, *The Entrepreneurial State: Debunking Public vs Private Sector Myths*, Public Affairs, 2018

³² Matthias Lehner, Oksana Mont, Eva Heiskanen, *Nudging – A promising tool for sustainable consumption behaviour?*, *Journal of Cleaner Production*, Volume 134, Part A, 2016, Pages 166-177,

³³ White, K., Habib, R., & Hardisty, D. J. (2019). *How to SHIFT Consumer Behaviors to be More Sustainable: A Literature Review and Guiding Framework*. *Journal of Marketing*, 83(3), 22-49.

Chapter 2: The Historical Precedent

2.1 The Genesis of planning: the USSR

The place of birth of Economic planning in the history of economic thought can be seen in Karl Marx's argument for a socialist society in which the "free and equal association of producers would regulate itself through common control"

Just as the savage must wrestle with Nature to satisfy his wants, to maintain and reproduce life, so must civilised man, and he must do so in all social formations and under all possible modes of production. With his development this realm of physical necessity expands as a result of his wants; but, at the same time, the forces of production which satisfy these wants also increase. Freedom in this field can only consist in socialised man, the associated producers, rationally regulating their interchange with Nature, bringing it under their common control, instead of being ruled by it as by the blind forces of Nature; and achieving this with the least expenditure of energy and under conditions most favourable to, and worthy of, their human nature.³⁴

The idea was then put into reality by the Bolshevik revolutionaries in 1920 after the creation of GOELRO, the State Committee for the Electrification of Russia, and its subsequent transformation into GOSPLAN in 1928 with the first implementation of the 5-year plans.

After the civil war and the period known as "War Communism" grain production had fallen by 56% pig iron output had fallen to 4% and steel output was only 13% of the original 1913 level³⁵. The apocalyptic situation of the country pushed Lenin and the Bolsheviks to institute the NEP (New Economic Policy). The NEP is an interesting case of a mixed economy, due to its characteristic as a political compromise between cleavages in civil society, (party and peasants) and as an economic regime to fuel national reconstruction³⁶. While the large-scale industries were nationalised and put under the direction of the Supreme Council of National Economy (VSNKh in

³⁴ Karl Marx, Capital Volume III, Marx and Engels Collected works volume 37, International Publishers page 807, 1998

³⁵ G.W. Nutter, Growth of Industrial Production in the Soviet Union, Princeton University Press, New Jersey, pp. 420, 438, 454-55, 1962

³⁶ Robert C. Allen, Farm to Factory a reinterpretation of the Soviet Industrial Revolution, Princeton University press, page 49, 2003

Russian)³⁷, and international trade was directed by the People's Commissariat of Trade, the internal trade, small scale industry and the majority of the agricultural sector were left to private proprietors. By the late 1920's the NEP had managed to rebuild the economy and it managed to reach the 1913 levels of economic output³⁸. Despite the success of the NEP, it was becoming increasingly untenable due to internal party divisions: caused by the power struggle between the different factions of the party. As well as the fact that the NEP effectively delayed the ambitions of the Bolsheviks of rapidly industrializing the country.³⁹

The debate over the shape that Soviet Industrialization would take began in 1924 after the scissors crisis of 1923⁴⁰, this event was what prompted the industrialization debate and the possibility of maintaining the NEP (New Economic Policy) or radically modifying it. The debate over the direction of industrialization spanned over a huge amount of topics ranging from the problem of acquiring foreign direct investment and foreign capital goods, the relation of the industrial sector to the peasant economy, and how much should the peasants and the "Nepmen" (small capitalists that had formed after the liberalization of trade) should be given free range to develop.

The NEP ended in 1929 and was replaced by the first Five-Year Plan alongside it the institution of imperative administrative planning and forced collectivization by the centre wing of the party led by Stalin were put into place. These policies then achieved super-industrialization and managed to economically transform the Union at a very high human cost, influencing Soviet planning until the end of the USSR, the Stalinist period was characterized by high imbalance between the industrial and agricultural sector and a style of management that relied heavily on administrative sanctions and direct command and control methods⁴¹.

³⁷ E. H. Carr, R. W. Davies, A History of Soviet Russia 10, Foundations of a planned economy 1926-1929, volume 1 part II, The Macmillan Press LTD, page 950, 1969

³⁸ Ibidem, page 951

³⁹ E. H. Carr, R. W. Davies, A History of Soviet Russia 9, Foundations of a planned economy 1926-1929, volume 1 part I, The Macmillan Press LTD pages 30-32, 1969

⁴⁰ Alexander Erlich, The Soviet Industrialization Debate 1924-1928, Harvard University press, introduction page xv, 1967

⁴¹ Robert Allen, pages 92-93,

2.2 The Scissors Crisis and the situation of the peasantry

The Industrialization debate happened after an event known as the “scissors crisis” in which agriculture had rebounded and the prices for agricultural goods were relatively stable at 1913 levels, but at the same time the retail prices for industrial goods had more than doubled⁴². The scissors crisis had multiple causes, one of the reasons for the “scissor” was that peasants sold their goods in wholesale markets, whereas industrial goods were bought from retail markets which were owned by private speculators. This deterioration of the “terms of trade” between the two set of prices pushed away the peasants from selling their agricultural goods to the cities, which were sold through state prices⁴³. As a way to retain their cash peasants started returning to household production and private trading, causing a reduction of available food for urban workers. The peasants homesteading their properties were also not subjected to the imperial taxation of the tsarist period, or to the forced grain requisitions of war communism, but a simple grain tax of lower magnitude,⁴⁴ so they were less compelled to sell on the state market to procure the cash needed to pay the state. Another factor was that despite being wealthier than before, peasants still had very low-calorie consumption, as such any increase in production was either consumed by them, or their surplus produce was sold in farmers market, on which the state could not come to extract a surplus through price policy.⁴⁵ At the same time the peasants demanded industrial goods in greater quantities than before, but their demand could not be accommodated due to the lack of productive capacity of the industries still rebounding from WWI and the civil war.⁴⁶

The structure of the peasant economy was also a problem for the Bolsheviks, they had redistributed the land after Lenin’s decree on land and reinstated the role of the communal village in agricultural production. But this posed a problem since they also wanted to foster mechanization in agriculture. The post-land decree countryside was not in a favourable spot for the plans of the Bolsheviks, the very high parcelling of land property created a huge base of homesteading producers, that could not mechanize due to the high costs and miniscule returns for a peasant farmer, as well as the risks that

⁴² Corinne Ann Guntzel, *Soviet Agricultural Pricing Policy and the Scissors Crisis of 1922-23*, University of Illinois, 1972

⁴³ Robert Allen, pages 78-86, 2003

⁴⁴ *Ibidem*, page 49

⁴⁵ *Ibidem*, pages 78-82

⁴⁶ Alexander Erlich, pages 32-36, 1967

investing their income on productive investment it would imply for their caloric intake (a situation similar to many sub-Saharan countries today). The only two sections of the countryside that could mechanize effectively were either the “kulaks” rich and upper-middle peasants that employed labour and had more land, or the collective farms. The kulaks were not a politically sustainable option due to the political aspiration of some of the Bolsheviks to “level the peasantry,” meaning reducing the inequalities inside of the strata, as well as for the restrictions on the ownership of land and hired labour. The collective farms instead were a minority in the panorama of the peasant production, comprising in 1929 only 3,5% of total grain sown land⁴⁷. The resulting situation was a deadlock⁴⁸.

A characteristic of the peasant economy according to Soviet economist Evgeny A. Preobrazhenski was that there was a large “hidden unemployment” meaning that there was a lot of redundancy in the agricultural workforce and that the more productive peasant farms had to sustain not just the farmer itself but also their relatives and other members of the homestead as such, for Preobrazhensky the same level of output could be maintained with less people.⁴⁹

2.3 A solution?

The solution to the scissors crisis was found in the lowering of the wages of industrial workers and adopting tighter price controls on industrial goods so that the peasants would be able to buy them again, but this had the effect of helping private traders that bought industrial goods en masse and then sold them at a premium, enriching the section of society that the government wanted to eliminate at all costs⁵⁰. The Bolsheviks then took action to eliminate the economic power of this stratum, there was the creation of the People’s Commissariat of Internal Trade, giving the institution the ability to finance trading cooperatives and expropriating the small retailers⁵¹. These policies had the effect to partially close the gap between industrial and agricultural goods, but the

⁴⁷ E. H. Carr, R. W. Davies, A History of Soviet Russia 9, page 180,

⁴⁸ E. H. Carr, A History of Soviet Russia 5, Socialism in one country 1924-26, volume I, The Macmillan Company pages 239-240, 1958

⁴⁹ Robert Allen, page 57, 2003

⁵⁰ E. H. Carr, A History of Soviet Russia 4, The Interregnum, The Macmillan Company, pages 121-122, 1954

⁵¹ Ibidem, pages 140-144

problem would re-present itself in 1925, this new crisis will be called the “Goods Famine”.⁵²

2.4 The Industrialization Debate

The main issues that the Soviet economy was facing in the 20's was that the producer goods industries of Soviet Russia were in a state that production was just enough to maintain the capital stock of the tsar era plants, and any expansion in more capital-intensive production techniques would have meant a depletion of the capital stock in other sections of the economy due to the limited availability⁵³. The years of the civil war had caused lengthy delays in the repair or replacement of said capital stock, destroying a large amount of capacity. In 1924 at the beginning of the debate the capital stock was reaching the maximum production capacity that it could sustain without having to invest in new plants, as there was still abundant unutilized capacity. In Soviet parlance they had to shift from the era of “restoration” to the era of “reconstruction.”⁵⁴⁵⁵ The other problem was the presence of the overcited “hidden unemployment” in the countryside, the employment of this surplus population was becoming a priority since the party wanted to refurbish the numbers of the urban working class which were severely depleted after the years of the civil war. Another reason that animated the Bolsheviki's desire was the fact that by employing this surplus population, the remaining farmers would be able to generate the savings required for the sustainment of industrial investments⁵⁶. The last problem of the Soviet Economy was that the main source of demand for industrial goods was the peasantry, which as said before was unreliable as a consumer to the nature of having a homestead, as such he could forfeit consumption of industrial goods⁵⁷, this posed a problem for the realization of profits and the extraction of a surplus from this strata, and due to the dilapidated state of the capital goods industry of the USSR, if peasant demand were to drop significantly, it would not have

⁵² Alexander Erlich, pages 25-26,

⁵³ Alexander Erlich, pages 33-34,

⁵⁴ Ibidem, introduction page xvii

⁵⁵ Ibidem page 21

⁵⁶ Ibidem, pages 84-87

⁵⁷ Ibidem, page 122-127

been possible for state factories to reorient their production to the consumption patterns of urban workers.⁵⁸

According to the members of the centre of the party, represented by Bukharin, the small peasant economy and light industry (producing consumer goods) should have been given more importance, in line with Lenin's argument for the need to access foreign trade and re-establish private enterprise in a limited way⁵⁹. After the disastrous period of war communism, in which neither peasant nor worker had any incentive to work other than the threat of violence. The centre wanted to increase demand from the peasant economy, by lowering of the price of industrial goods, There was also the fear that the monopolistic structure of soviet industry would result in "industrial slack"⁶⁰; by lowering the price of the industrial goods, the managers of the enterprises would start to employ more productive techniques, reducing unit costs to restore the profitability of the enterprises, which at the time still operated on the principle of "profit-loss accounting". The use of more capital-intensive production methods to lower unit prices in the industrial sector would have also generated for Bukharin a higher rate of capital accumulation, through an increased turnover of sales and as such a lowering of inventory costs⁶¹. The way in which the capital stock would have been sustained was via the import of industrial equipment from the west, the peasant economy would have supplied the agricultural goods that would then have been exchanged in foreign markets to obtain the capital goods necessary for the development of industry. Bukharin and the centre were also very "liberal" in regard to foreign trade, they wanted to import those kind of industrial goods, such as tractors, which would generate complementarities with the other nationalized industries, such as oil extraction, while at the same time improving the productivity of the agricultural sector⁶². The peasant producers according to the centre and right opposition were supposed to become richer, but they had to be integrated into the process of socialist construction, by incentivizing voluntary collectivization, helping the cooperative sector develop in the areas of trade, farming, and credit lines, trying to "erode the economic base of the kulaks."⁶³ The emphasis on

⁵⁸ Ibidem page 22

⁵⁹ Ibidem pages 8-9

⁶⁰ Ibidem page 23

⁶¹ Ibidem pages 78-79

⁶² Ibidem pages 13-14

⁶³ Ibidem pages 17-18

the peasant economy was also justified under the presupposition that while peasant demand could always be increased the amount of food that it could produce was not, and to achieve a higher rate of utilization of capital, it was necessary first to increase the available food supply to sustain the industrial working class operating the capital goods and consumer industries.⁶⁴

The main enemy of the centre wing of the РКП (б) (Russian Communist Party, [Bolshevik]) was Evgeni A. Preobrazhenski, the chief economist of the left wing of the party, he feared that due to the situation of the capital stock of the USSR if capital intensive development, especially in producer goods industries, was not pursued, then the Union would have lagged behind and they would not have been able to achieve the desired rate of economic growth, not be able to renovate the capital stock and to remilitarize itself.⁶⁵ The left wing was characterized by a desire for a higher taxation of the peasantry and a higher tempo of industrialization by creating a big push for investment to reach a new equilibrium, increasing the production possibility frontier of the Soviet economy. There was also another element that Preobrazhensky emphasized, that is if agriculture were to grow to an acceptable level, it could only do so through a higher employment of capital per-head. Considering the labour displacing effects of the mechanization of agriculture it was imperative to have a high rate of capital formation in industry to absorb the surplus population residing in the countryside as well as to exploit the technological and economic complementarities of this huge wave of “bunched up” investments⁶⁶. This, combined with the fear of foreign invasion, was the main driver behind the demand of the left wing of the party for an accelerated rate of capital accumulation in heavy industry. The higher rate of accumulation in producer goods industry would have been obtained by implementing a policy of “primitive socialist accumulation⁶⁷.” The left wing proposed “squeezing the peasantry dry” by increasing prices on industrial goods: it should have been done by employing the state’s monopolistic position in industry to extract a surplus from the agricultural sector while also setting lower state prices for the procurement of grain compared to the private traders sector. The capital obtained from the “squeezing” of the peasant economy, called

⁶⁴ Ibidem page 21

⁶⁵ Ibidem page 51

⁶⁶ Ibidem pages 34-39

⁶⁷ Ibidem pages 43-44

“forced savings” by the left opposition, would then be used to renew and build new plants, buy the capital goods, industrial advisors and know-how on western markets, finance coordinated investments into producer good industries,⁶⁸ increase the capital intensity of the Soviet economy and then lower industrial prices. The Left opposition also wanted to maintain the independence of Soviet industry from imported capital goods, Preobrazhensky argued for a “socialist protectionism” based on the infant industry argument, in which he argued that the state should develop production sites which, while initially importing capital goods, by using the state monopoly on trade, it would protect their infant industries from an excessive inflow of foreign capital goods, afterwards domestic production will then increase and the imported goods will no longer play a role.⁶⁹ Preobrazhensky was essentially arguing for import-substitution, not only because of the interest it had in securing socialism from the world market, but also because of the technological structure of the economy, since the total amount of capital goods that could be bought from foreign trade depended on agricultural products which means that they would have to sell part of the produce needed for the feeding of the workforce and that due to the low price of agricultural commodities the capital procurement by its very nature could not satisfy the enormous demand needed for the “reconstruction”.⁷⁰

The right wing of the party in the debate was led by and Sokol’nikov, high ranking members of the People’s Commissariat of Finance, they pushed for a higher emphasis in the development of agriculture. He argued that by emphasizing the development of more labour-intensive production in the agricultural sector they could achieve a higher rate of turnover, by mobilising more labour for the same amount of capital, increasing soviet growth in the long run. After the initial round of investments, the comparative advantage of the Russian Economy would then have shifted from agriculture to industry, the new avenues for trade would then have to continuously financed the technological renewal of the Soviet economy.⁷¹

The possibility of applying either the plan of either the right, centre or the left wing of the party was complicated by various factors: the political capital of the Bolshevics with

⁶⁸ Ibidem, pages 48-59

⁶⁹ Ibidem, pages 44-48

⁷⁰ Ibidem, pages 31-59

⁷¹ Ibidem, pages 24-31

the peasantry was at an all-time low in 1923, any move against the peasantry in those years would have meant the destruction of the worker-peasant alliance the so called “Smychka”, and revolts against the central government⁷². The right’s position was untenable was the difficulty in acquiring the necessary capital stock from western markets on the scale that was required, since trade also had not recovered to . Another element that put fear into the hearts of Soviet politicians was the fact that peasant production could still survive without the industrial goods received from the cities and could compensate with household production if this would have come true it would have meant the end for the industrial sector. Lastly Bukharin’s presuppositions that just lowering the price of industrial goods would have been enough to speed up the tempo of accumulation was at odds with the fact that an increase in demand by the peasants without enough productive capacity to sustain the volume of sales would have just caused a scarcity of industrial goods. The fact that they had to lower the wages of workers to sustain the lower industrial prices, eroding their base of support in the industrial working class, mining the authority of the party with its base constituency. Preobrazhenski also claimed against his opponent Shanin, who proposed coordinated investments into labour intensive industries as a way to increase turnover and get a greater mass of profit, while avoiding technological unemployment, that the restoration of the producer and extractive industries of the Union would then allow the "chain connection” between the sectors to fully operate creating positive spillovers, (we are talking about technological complementarities between sectors of the economy). Shanin conceded and said that in the case of the railways this was the way to go.

2.5 The NEP after 1925

The fears of the left wing of the RCP seemed to wane in 1925 when the gross capital investment in the capital stock for the first-time exceeded depreciation and replacement⁷³, but this was not going to last. After the initial growth and the good harvest of 1925, industrial output did not go over 90% of the pre-revolutionary output⁷⁴, due to the fact that this growth was not achieved through the building of new capacity,

⁷² Lazar Volin, *A Century of Russian Agriculture from Alexander II to Khrushchev*, Russian Research Centre 63, Harvard University Press, pages 162-168, 1970

⁷³ E.H Carr, R. W. Davies *A history of soviet Russia* volume 9, page 271

⁷⁴ Alexander Erlich. Pages 104-106

but the more intense utilization of tsarist industry, this was combined by a second crisis known as the goods famine. The crisis originated from a lack of industrial goods to be sold to the peasants and the general population, this was due to a lack of finished goods that could bridge the gap between the time of construction of the new plants and them being put in operation, as well as the lack of iron and steel, the output of these industries were still below the 1913 level . This development severely enraged the Bolsheviks who were anxious for a wave of sustained industrialization.

Preobrazhenski strongly criticized the development of state policy and demanded more aggressive measures to limit the goods famine he proposed: increasing taxes on the peasantry, allocate investment in the producer goods industry and stopping the price cutting of industrial goods. The rationale was that by increasing the taxation of the peasants they would have reduced the concealed inflation plaguing the economy by reducing the demand of the peasant market as well as obtaining more capital for industrialization. After the increase in “forced savings” the industrial sector could then develop and end the goods famine, (the Soviet term for concealed inflation). The direction of investment into industry would also generate more savings, through price reduction of unit prices of commodities after having before expanded capacity. In this way the economy would have also been able to recuperate its level of industrial output especially the output of ferrous mineral production, which in 1925 was still at two-thirds of the 1913 and caused a great deal of problems to the expansion of the capital goods industry.

After 1926 the main mechanism for governing economic policy was the drafting of the so-called control figures. Annual plans for investment and output in the state-owned industrial sector, which rapidly became of paramount importance for the party to direct national economic policy, even if initially they had mostly an indicative role and were not supposed to be used as directives⁷⁵.

During the slump of the 1926-1927 period the initially programmed rate of investment in industry was cut from the 1152 million rubbles proposed from the VSNKh to 1086, the VSNKh then increased it once again to 1183, and this proposed budget was

⁷⁵ E. H. Carr, R. W. Davies *A history of Soviet Russia* 10, pages 809-811

adopted⁷⁶. Due to the worsening of the goods famine, despite improvements in the industrial situation of the capital and consumer goods industry, the situation on the ground was becoming untenable as the demand for industrial goods was still ramping up and production was still lagging behind due the previously mentioned lack of finished products, iron, and steel. Bukharin asked for restraint in the spending spree of the government, as he saw that the spending in the construction of new plants and replacements would simply cause an increase in demand, and due to the fact that the investments would only be realized in a few years the “advancing on a broad front” would have simply worsened the crisis and deprived agriculture of the capital needed for industrialization⁷⁷. The growth of the industrial sector in the 1927-1928 period defied the expectations of the more pessimist thinkers, giving strength to the advocates of planned growth and the “super-industrializers”, production of both consumer goods and producer goods industries accelerated achieving a 19 per cent growth in terms of 1926-1927 prices far greater than what was expected in the control figures of July 1927. The total investment for that year was 1304 million rubbles - an increase of 21 per cent over 1926-1927 and production increased by 26,3 per cent in terms of 1926-1927 prices in the state industry⁷⁸. The control figures and industrial output of 1929 highlight a continuation of the trend in which investment was once again risen putting pressure on the state budget, the total investment for that year was 1679 million rubbles with an increase of total industrial output in state industry by 23,7% and total output by 16,8%, despite the crisis of grain collections which did little to slow down the pace of industrialization⁷⁹.

2.6 The end of the NEP and the beginning of Stalinist planning

The combined push by the “super-industrializers”, the need to overcome the grain procurements crisis, alongside spurring development in industry caused a three-pronged push on the Soviet state apparatus that ultimately led to the demise of the NEP and the establishment of the system of Five-Year Plans.

⁷⁶ E. H. Carr, R. W. Davies *A history of Soviet Russia* 9, 296-301

⁷⁷ *Ibidem*, 303

⁷⁸ *Ibidem*, 310-311

⁷⁹ *Ibidem*, 325-331

2.6.1 Debates on the planning method

The final draft for Five-Year Plan was written in 1928 and adopted by the fifth congress of Soviets in May 1929⁸⁰, it was drafted by a variety of economists even coming from outside the party, like in the case of Bazarov. The First Five-Year plan was had two versions, an “optimal” one and a “starting” one⁸¹, it outlined the different connections between the industrial sectors of the union⁸². The plan was drafted by Gosplan, and it was the place of struggle between two schools of thought: the “genetic” and “teleological” planners. The two schools of planning were in the beginning united in the struggle against the anti-planning group of economists in the Narkomfin (People’s Commissariat of Finance) and some Soviet politicians like Rykov and Kamenev⁸³. The geneticists were of the opinion that the First Five-Year Plan needed to take into account market mechanisms and peasant resistance when it drafted the control figures (which up until that time remained merely indications for the scale of investment and output) due to their perception that the market would have remained in place for a long time, since it could only be destroyed by the collectivization and socialization of agriculture, which was going to be achieved through economic incentives. The main representatives of this view were Bazarov and Groman from the State Planning Agency and Strumillin from the statistics agency⁸⁴. The teleologists instead believed that the goals of the plan could be determined quite independently from the constraints of the market and peasants and focused more on the material requirements for the sustained rate of industrialization, the main representatives of this position were Feldman and Krzhizhanovsky of Gosplan and While initially they had more amenable views towards the permanence of market relations in the USSR, the relatively successful implementation of physical planning in state industry, radicalized their positions and gradually came to the conclusion that the plan was going to overtake the market as the main economic relation that governed the Soviet economy.⁸⁵

Generally over the course of the years the position of the teleologists came to dominate, which also later came to emphasize that it was not the forecasts but the directives of the

⁸⁰ E.H. Carr, R.W Davies A history of Soviet Russia 10, page 897

⁸¹ Ibidem, page 858-859

⁸² Ibidem, page 625

⁸³ Ibidem, page 787

⁸⁴ Ibidem, pages 787-801

⁸⁵ Ibidem page 797

plan were its linchpins, this shift in policy was a reflection of the radicalism that assailed the party after 1926-27 and the fear of war generated by a worsening of international relations in 1927 and the perceived necessity of an heroic struggle against the market to finally end the goods famine once and for all. Contemporary to the discussion between teleological and geneticists there was a discussion over the meaning of equilibrium in the soviet economy, according to soviet planners there were two kinds of equilibrium: short term equilibrium regarded the correct proportions between supply and demand on the market, whereas long-term equilibrium regarded the maintenance of correct proportions between the sectors of the economy as well as between production and consumption, as well as avoiding “disproportions”, between agricultural and industrial prices, rates of growth and the different level of demand for goods in both sectors⁸⁶.

The concept of economic equilibrium was replaced in 1928 by one of balances, balances were accounts or budgets of receipts and outgoings expressed in physical or monetary terms⁸⁷. According to Bazarov they were necessary to achieve a plan that was resistant against arbitrary targets. The method, as it was employed in the middle nineteen-twenties served the purpose to facilitate coordination between the different parts of the economy and to reduce, or eliminate, disequilibrium or disproportion, discover bottlenecks and try to secure an acceptable amount of reserve goods for the entirety of the soviet economy.⁸⁸ The concept of equilibrium and balances had existed side by side for a period, but while the theory of equilibrium became associated with Bukharin and the united opposition, the theory of balances became the battle cry of the industrializers as their role in finding bottlenecks was used as a justification to enhance the scope of the plan and overcome said bottlenecks as well as the immediate . The advance of the teleologists also meant the repudiation of the methods of planning favoured by the geneticists and like the reference to the trajectories of growth of capitalist countries as a baseline for the soviet economy. Another planning method employed in the middle nineteen-twenties was the use of “ static and dynamic coefficients” to deduce existing economic trends, this method, which was closely

⁸⁶ Ibidem 794-799

⁸⁷ Ibidem page 798

⁸⁸ Ibidem page 798

connected with the genetic approach, soon became “persona non-grata” to the teleologists.⁸⁹

Material balances as a method of planning became common place during the late 1920’s during the industrialization drive. It firstly originated in November 1925 when the various industries who consumed metal and steel under the state trusts started to compile orders of physical goods to the VSNKh, due to the lack of availability, the system then became generalised for the strategic industries of the USSR, creating a basis for the material balance approach to planning⁹⁰. The rise of syndicates, cooperative wholesalers financially dependent on the state, as the main suppliers of goods, also played a role in the formation of the system of material balances, as wholesale selling of industrial goods was monopolized, in various degrees, by the respective industrial syndicate.⁹¹

2.6.2 Gosplan becomes the demiurge

Gosplan during this period also came to dominate as the becoming at first the coordinating, but not a directing, organ of the Soviet economy after the proposition by the workers and peasant inspectorate (Rabkrin), since before the decree of the Sovnarkom of the 8th of June 1927 it was only one of the many planning agencies present in the all-Union and republican commissariats. In two years the Gosplan became the dominating agency in regard to central planning. This can be seen with the development of a “synthetic” structure in which the various internal departments of Gosplan came to resemble the entire administrative structure of the Soviet economy. By 1929 the regional planning commission were directly under the control of Gosplan and organized under its regionalisation department.⁹²

⁸⁹ Ibidem 796

⁹⁰ Ibidem, 830-831

⁹¹ Ibidem, page 641

⁹² Ibidem, pages 802-809

2.7 The drafting of the first Five-Year Plan

The origins of the Five-Year Plan are found in the so called Osvok hypothesis, in which for the first time the Gosplan party and non-party economists started to draft a plan for the reconstruction of industry: The Hypothesis was an attempt to understand the economic prospects of each industry in detail, and to arrive at precise conclusions about the location and capacity of the new projects and the factories which were required for such projects⁹³. The main problem of this first proposal was its reliance on the “operating plans” or “promflinplan” of the various industries under the direction of the VSNKh⁹⁴. The operating plans were drafted independently from each other and relied on a series of different assumptions on the state of future demand and production for the products of their own industries and the level of development of the other sectors of the economy. Gosplan started working on its proposal in 1926 as in the case of the Osvok hypothesis it was a plan for the state sector in which agricultural production and investment were just estimates, it followed more or less the same methodology, but it lacked the detailed tables of the Osvok proposal. Both drafts proposed that the investment in industry should be accompanied by a decrease in unit prices by an increase in the productivity of labour, reduction of inventory costs and in general the decline of unit costs per product. They differed in the amount of the gains that the industrial labourers would receive from the overcited increased productivity in the form of increased wages. The decrease of unit costs would have also allowed according to Gosplan the closing of the “scissor” between agricultural and industrial prices⁹⁵. The proposals of 1926 also caused debate over the number of investments that should be made in agriculture and the shape of industrial growth in the Soviet Union. The industrial capacity of pre-revolutionary Russia was close to being fully utilized, as such there was the issue that the growth of industrial production would start to slow down compared to the previous period, this introduced another element in the debate about the feasibility of a continued high rate of industrialization, this aspect will be known in Soviet parlance as the “levelling-off curve”. The “levelling off-curve” was the assumption that after the period was over and the productive capacity of older industry was fully utilized the rate of growth of industrial output would slow down, the theory

⁹³ Ibidem pages 844-851

⁹⁴ Ibidem pages 846-847

⁹⁵ Ibidem pages 851-854

was countered by the theory of the “rising curve” by the “super industrializers”⁹⁶ in which the new technical basis of the soviet economy would have allowed for higher productivity and as such a higher rate of growth.

The successive development of the drafts of 1927 and 1928 highlighted a new development in soviet planning. The proposed figures of 1927 VSNKh and Gosplan were considered too pessimistic and began drafting figures for industrial development that required the increase of capital investment to a level that would impact the standard of life of both worker and peasant, by increasing the capital investment in industry by more than 50%. The VSNKh took the lead and started drafting more optimistic control figures which thought that industrial development could be funded by the auto financing of industries without requiring assistance from the state budget, a proposal that was harshly criticized by the united opposition of the party due also the crude statistical methods employed which were thought to not have a strong basis in economic reality⁹⁷. The shift can also be exemplified by the assault against non-party economists and the radiation of Kondratiev from the Konjunktur institute of Narkomfin after the 15th party congress⁹⁸. The partial approval of the draft of the VSNKh instead of the Gosplan proposal also was a prelude to the heterarchical structure that the Soviet economy will develop during Stalinist planning, and the subsequent competition between different ministries. The congress cemented the idea that planning was going to replace the market as the main regulator of economic life in the Soviet state.⁹⁹

In January 1928, Strumilin, which passed to the side of the “teleologists,” strongly attacked his critics, Strumilin associated Groman and Bazarov with Kondratiev, and declared that any attempt to balance capital expenditure with capital accumulation and demand with supply were just superfluous operations when compared to the fundamental objective of the five-year plan of increasing capital construction¹⁰⁰, marking a definitive rift between party and non-party economists, which were rapidly declining in popularity.

⁹⁶ Ibidem pages 862-864

⁹⁷ Ibidem pages 865-874

⁹⁸ Ibidem page 875

⁹⁹ Ibidem pages 874-887

¹⁰⁰ Ibidem page 875

It should be said that the statistical offices which were supposed to identify the real limits of the Soviet economy were not able to provide detailed enough figures fast enough for the realization of a balanced five-year plan, this was a limit that non-party economists recognized but the “super-industrializers” in the party did not, confident in their ability that by simply drawing more resources in bottlenecked sectors would be enough to guarantee an accelerated rate of expansion of industry and that the statistical methods would improve as the five year plan was developed.¹⁰¹¹⁰²

The following months until the ratification of the 5 year plan by the Sovnarkom were characterized by an all-out industrialization frenzy, guaranteed by an unwavering optimism and faith in the soviet model and the rationalizations provided by the planning institutions reaching borderline institutional insanity, to stress this element it is noteworthy to highlight that the proposed figure for the increase in pig-iron production of 1928 was 8.7 million tons from a 5.8 million tons, the specialists working in the extraction industry already emphasized how this figure was both financially and physically impossible to reach, the successive figure that was adopted for the draft of 1929 was 10 million tons¹⁰³. Both Gosplan and the VSNKh continued proposing higher figures for industrialization the apex was reached with the December draft of the VSNKh which was then adopted by Gosplan in which industrial output was to be increased in the five year period by 180%, capital goods production would have reached 230% of the 1928 level, labour productivity needed to be raised by 110%, capital investment would have reached the level of 16.4 billion rubbles of which 78% was to be allocated to the capital goods industries, industrial prices should have also been cut by 35%¹⁰⁴. The continuous push for the increase of the figures also had a political character, as in the years of 1928 to 1929 there was a harsh struggle against the right wing of the RCP (b), led by Bukharin, which argued for more restraint in the construction of the plan and was subsequently denounced as reactionary. The most impressive development of the draft of 1929 by both Gosplan and the VSNKh was the development of regional plans that allowed for some level of harmonization of

¹⁰¹ Ibidem page 872

¹⁰² Ibidem page 833

¹⁰³ Ibidem page 877

¹⁰⁴ Ibidem pages 888-897

industrial development¹⁰⁵. The first Five-Year was adopted in May 1929 by the sixteenth party congress and later by Sovnarkom, signing it into law.

2.8 The Nail in the coffin

The NEP got his final nail in the coffin with the end of the more lenient period towards the peasantry, in 1928 there was a crisis in the procurement of grain from the countryside, this marked a turning point in the relationship between the state and the peasants, the communists, that up until that point had favoured a strategy focusing on the development of the agricultural sector, returned to the “administrative methods” of war communism¹⁰⁶. To avoid starvation in the cities they reintroduced the direct grain requisitions with the so-called Ural-Siberian method, causing unrest in the peasantry and Kulaks, while moving towards the direction of the forced collectivization of agriculture. The procurement crisis was both the fault of the price system of the Union which did not allow for the collection of sufficient stocks of grain, rye, and other cereals, due to the unfavourable prices set by the state and cooperative sector, which by now controlled more than 80% of internal trade. This was combined with the general fear that a war was going to take place in 1927¹⁰⁷, due to this fear the peasants and kulaks started to hoard grain and other cereals causing the ire of Soviet officials. The repressive push by the state moved some of the peasants to pre-emptively collectivize their farms, other to actively resist collectivization and requisitioning efforts by the authorities. In the period from 1928 to 1929 the collective sector had grown from less than 3 percent to 29 percent¹⁰⁸.

The push for the collectivization of agriculture also marked an increasing radicalism by part of the lower echelons of the party, where the local officials of the Komsomol and poor peasants collaborated to collectivize large estates. Collectivization in this sense is not only a mechanism for achieving socialist agriculture, but also to “collect” the grain

¹⁰⁵ Ibidem pages 895-896

¹⁰⁶ Robert Allen, pages 97-98

¹⁰⁷ John P. Sontag, The Soviet War Scare of 1926-27, The Russian Review, Vol. 34, No. 1 (Jan. 1975), University of Kansas, pages 66-77

¹⁰⁸ J. V. Stalin, Works, Vol. 12, Dizzy with Success pp. 197-205, Foreign Languages Publishing House, 1955.

needed for the industrialization, the result of the collectivization of agriculture was the release of vast amounts of surplus population from the countryside to the cities.¹⁰⁹

The main model behind Stalin's industrial revolution was the so-called Feldman model, based on Marx's reproduction schema it is pretty similar to a Harrod-Domar linear growth model. It divided the economy into two departments, in traditional Marxist parlance we are talking about "Department I" and "Department II," the producer goods industry and the consumer goods industry, and he derived a model for capital accumulation. He found that he could both increase investment into producer goods industries and increase production of consumer goods after a period of time, the model had several assumptions, but the most important for the soviet case were: the non-possibility of importing capital goods from the outside, huge surplus population in the countryside that could be employed in industry (similar assumption to the Lewis Model with marginal productivity in the traditional sector being zero), the output of a sector depended only on the capital stock employed, that there are no changes in prices, and that full capacity is employed, assumptions that are also implicit in Marx's reproduction schema's in Capital Volume II. The capital goods sector would have been financed itself through reinvestment, denoted by a variable e the consumer goods industry (which includes agriculture) would have been financed by the remaining capital stock. Increasing reinvestment in the capital goods sector would have caused, depending on magnitude of reinvestment, a temporary drop in consumption and in expansion of the consumer goods industries, which would then have been compensated by a future growth and enhanced productivity due to the higher level of capital intensity.¹¹⁰

The collectivization of agriculture effectively meant the squeezing of the peasantry not anymore on a price or tax basis, but the direct exploitation of the peasantry by forcing them into collective farms and getting grain procurements at a fixed and forced sale to the state, already before the implementation of the policy in 1929 the state had taken possession of both seeding and distribution of agricultural equipment through the use of the industrial syndicates and the cooperatives. Stalin, which now had won the struggle for power inside of the party against the left and united opposition, , decided to effectively change the meaning of the quotas that were initially drafted by the Gosplan

¹⁰⁹ Robert Allen pages 183-186

¹¹⁰ Ibidem, pages 54-57

economists, in order to no longer delay the process of super-industrialization, which was now underway, and to transform the quotas from what essentially were forecasts of the growth of the Soviet Union, into directives. Now the quotas were no longer estimates but orders that were given to the lower ranks of the bureaucracy, state trusts and firms that had to be fulfilled, to incentivize production at all costs, the quotas were also being continuously raised in such a way that the output would be maximized no matter what¹¹¹. Stalin adopted the proposals of the left opposition and supercharged them.

When the first five-year plan was implemented there was also a shift in how the state-owned enterprises under the VSNKh operated, in the past they followed a system of profit-loss accounting, meaning that they would decide their investments based on the expected profitability of their expansion, according to the soviet planners this system would not have allowed them to reach the desired quota of investments to make super-industrialization happen, as such they developed a system in which the state would always offer more lines of credit for the SOE's creating a system that the economist Janos Kornai defined as soft-budget constraints¹¹². The transformation of quotas into orders that had to be reached, combined with the creation of soft budget constraints was what allowed the Soviet Union to increase its industrial output by 118% increase the capital goods and consumer goods industry saw respectively a 158% and 87%¹¹³ increase in output, Stalin's big push was realized, and the Soviet Union got on the road of becoming a major superpower at an incredibly high cost.

¹¹¹ Robert Allen, page 92-93

¹¹² Robert Allen, pages 91-94

¹¹³ Dobb, Maurice. "Rates of Growth under the Five-year Plans." *Soviet Studies* 4, no. 4, pages 364–85, 1953

Chapter 3: Failures of Central Planning

Central planning as we have seen, has had a troubled history, it is associated with rampant excesses and loss of human life as well as general inefficiency and informational problems. This can be seen in the general failure of the planned economies to introduce rapidly modern technologies in the factories or the general failure of the USSR to develop a computer industry¹¹⁴, or in the absolutely bureaucratic and inefficient nature of the soviet administration, management and planning as well as its rationale for economic investment¹¹⁵¹¹⁶ and determining the quality of production.

The reasons for these failures may be found in a debate that preceded the birth of Soviet planning, which took place in a more western place, the ex-Austro-Hungarian Empire.

3.1 The Socialist Calculation Debate

The debate started initially in 1920 inside of a congregation known as the Vienna Circle, after the socialist economist Otto Neurath argued for the utilization of the techniques employed by the Austro-Hungarian war ministry during the First World War to plan a socialist economy by using physical inputs rather than money and prices.¹¹⁷ The proposal caused immediate controversy and in 1920, a year after the Neurath made his proposal public, Ludwig von Mises released his book “Economic Calculation in the Socialist Commonwealth”. In the book Mises declared the impossibility of socialist planning on the basis of the fact that the abolishment of money and prices meant the ceasing of economic rationality¹¹⁸. Prices for Mises are the main indicator of economic success in an economy, if the price system were to be abolished the individual or collective entrepreneur would not have a way to compare its costs and success by looking at his balance sheet made up of simply inputs and outflows of physical

¹¹⁴ Benjamin Peters, *How Not to Network a Nation: The Uneasy History of the Soviet Internet*, The MIT Press, 2018

¹¹⁵ Eugene Zaleski, *Stalinist Planning for Economic Growth 1933-1952*, University of North Carolina Press, pages 482-512, 1980

¹¹⁶ Whitesell, Robert S. Why Does the Soviet Economy Appear to Be Allocatively Efficient? *Soviet Studies* 42, no. 2 (1990): 259–68.

¹¹⁷ Otto Neurath, “Through War Economy to Economy in Kind”, (1919), in “Empiricism and Sociology”, Edited by Marie Neurath and Robert S. Cohen, D. Reidel Publishing Company, pages 123-157, 1973

¹¹⁸ L. von Mises, 'Die Wirtschaftsrechnung im Sozialistischen Gemeinwesen', *Archiv fur Sozialwissenschaften*, 47 (1920), translated as 'Economic Calculation in the Socialist Commonwealth', in *Collectivist Economic Planning*, ed. Hayek, George Routledge & Sons, Ltd., London, pages 95-111, 1938

goods¹¹⁹. Mises also claimed that the institutional setting of the market, if it were to be abolished, would also stop the process of discovery and innovation¹²⁰. Competition for the greatest possible profit, so he argued, was the main driver for the application and discovery of new knowledge and information as well as preferences. The last two points Mises made were that due to the structure of cooperative ownership responsibility for failure would also be shared making it impossible to actually decide who is to blame and improve on the error it committed¹²¹, the other point is that due to the fact that production goods are held in common and are the property of the whole of society they would not be exchanged, making it impossible to determine their real value and contribution to economic life as well as its alternative uses¹²².

Unfortunately for Mises the mere existence of Gosplan and the fact that central planning existed and operated for more than 60 years in the Eastern Bloc, despite all of its problems, made his claim of the impossibility of economic calculation in a socialist society null. Despite this his critique still holds value especially when looking at the fact that planning in the Soviet Union and Warsaw Pact countries had serious problems in regard to assigning responsibility for failures, in fact state enterprises were encouraged to underproduce, and inefficient use of resources by part of state enterprises as well as a lack of adoption of new technologies, this can be seen in the fact that “intensive” (capital consuming) rather than “extensive” (labour consuming) economic development was pursued only from the 70’s onwards¹²³.

The debate continued in the 1930’s the two main discussants in this period were Friederick von Hayek and the two socialist economists Abba Lerner and Oskar Lange. The focus of the debate shifted in those years: the Austrian School no longer sustained the impossibility of socialist calculation and instead talked about to the relative efficiency of capitalist economic compared to socialist planning. Whereas the socialist side shifted its focus from the defence of planning in its totality to the possibility of arriving at a solution that equalled or surpassed the market in terms of efficiency, even by utilizing market or pseudo-market mechanisms for allocation.

¹¹⁹ Ibidem, pages 110-116

¹²⁰ Ibidem, pages 118-120

¹²¹ Ibidem pages 116-121

¹²² Ibidem pages 91-92

¹²³ Central Intelligence Agency, Soviet Intensive Economic Development in Perspective, released in 1998

Oskar Lange and Abba Lerner developed a neo-classical model of a socialist economy in which the central planning commission would be the main coordinator of the socialist economy. The socialist economists based their trial-and-error scheme on the writing of Enrico Barone, in which he created a “neutral” model of an economy which utilizes the principle of Pareto efficiency to compare capitalist and socialist economies¹²⁴. The model created by Lange in 1936 and then was expanded by Abba Lerner. The Lange-Lerner model made it so that state enterprises would receive their capital goods and non-labour inputs from the industrial ministries under the direction of the central planning board, enterprise managers would then be incentivized to set the price to be equal to the marginal cost by following two principles, that the production of consumer goods should be equal to the amount that the consumers can buy and that the producer goods that need to be accounted for an industry should be valued at a price equal to its average cost, to simulate the free entry and exit of firms in a capitalist market, achieving Pareto efficiency. While capital and intermediate goods would be assigned directly, final and consumer goods would be allocated through the market, the planners would then use the feedback loop of demand and through a system of trial and error they will achieve economic equilibrium by setting different output and price targets. Since for them the market is a process of trial and error as many entrepreneurs make decisions at the margin, the Central Planning board can do the same by looking at divergences and inconsistencies across the entire economy and incentivize consistency and efficiency in the entire economy.¹²⁵

In a sense the Central Planning commission would become the “Walrasian auctioneer” of the entire economy and by trial and error it would ascertain the correct output targets that it has to attach to every commodity for it to reach equilibrium and market-clearing prices. Strangely enough, Walras, the father of neo-classical microeconomics had non-Marxian socialist politics¹²⁶, and this proposal by the socialist economists would be a full realization of his theoretical schema.

¹²⁴ Enrico Barone, *Il Ministro della Produzione nello Stato Collettivista*. *Giornale Degli Economisti* 37 (Anno 19) pages 267–93, 1908

¹²⁵ Lange, Oskar, *On the Economic Theory of Socialism: Part One*. *The Review of Economic Studies* 4, no. 1, pages 53–71, 1936

¹²⁶ Johanna Bockman, *Markets in the Name of Socialism: The Left-Wing Origins of Neoliberalism*, Stanford University Press, pages 21-22, 2011

The main challenger of the socialist side of the calculation debate was in this time the Austrian Economist Friederich von Hayek, he published a famous piece in the American Economic review called “The Use of Knowledge in Society”, in the paper Hayek lashes out against his opponents in the calculation debate arguing that while it is true that the socialist state could theoretically solve the equations needed to have an efficient allocation of economic resources, the actual knowledge needed to create the equations themselves is not given in a ready-made form, but exists in a dispersed form across all the economic units. The problem for Hayek is that the socialist state due to the common ownership of the means of production and the lack of market mechanisms cannot actually access the information that is needed to draft the equations in the first place. Following from this, the Austrian admits that every single economic process in society can be defined as planning, as a business needs to make a plan for its action in the marketplace as much as a central planning board needs to draft input output tables for the whole economy, but the main point is that only the decentral planning of the market characterized by the mutual comparison of prices, profit rates, market shares etc. can actually be the instrument to gather the dispersed knowledge in society, whereas central planning blocks this development against the spontaneous order of the market.¹²⁷ Another characteristic of the market for Hayek is that it disciplines the economic behaviour of the actors by selecting the relevant information before any exchange is made through competition, the behaviour of the actors also dynamically changes the situation, the change is then represented by the movement of prices without anyone knowing specifically what happened. The institutional setup of the market is also the mechanism through which economic rationality is reached.

The debate highlighted from a theoretical viewpoint the difficulties that a planned economy may have by replacing the market mechanism and the proposed solution of the Lange-Lerner model set a precedent for attempts at reform in the Comecon bloc. The socialist economies of the USSR and Hungary to initiate a series of limited market reforms, in Hungary there was the rolling out of the “New Economic Mechanism” and in the Soviet Union there was the rolling out of the “Kosygin-Liberman reform” and the subsequent clash between the liberal reformers and the Cyberneticists.

¹²⁷ F. Hayek, 'The Uses of Knowledge in Society', American Economic Review, September 1945

3.2 The Attempted Reforms

The Failures of planning were not a mystery to the people who operated it day-by-day, in the Eastern Block after the death of Stalin in 1953 there were many attempts to reform the command economies, this section will look at some of those attempts in the Hungarian People's Republic and the USSR.

3.2.1 Goulash Communism

The New Economic Mechanism rolled out in 1968 which later came to be known as “Goulash Communism” was favoured after the death of Joseph Stalin, Imre Nagy the leader of the country in 1954 transformed the profession of economics in Hungary making it independent from the diktats of the party and the Soviet Union. Nagy created around himself a base of power in the economic institutions of the country by aligning himself with experts that were previously marginalized under the Rakosi administration. Nagy re-opened the position of independent researchers for economists by creating the Economic Science Institute¹²⁸, in which a new generation of reform economists trained in empirical economic research that was mostly concerned with the problems regarding the construction of socialism and the realities of economic planning in the Hungarian context¹²⁹. The economists working in the Institute also had access to a variety of western economic publications that were mostly in the framework of neoclassical economics¹³⁰. The participation of Hungarian reform economists to the transnational neoclassical economic debate is well documented. After the fall of the Nagy government in 1956 due to soviet intervention the institute continued to operate and influence economic life in the country. The reform economists continuously criticized the over bureaucratization of the economy and the arbitrariness of its goals for economic development, in its place the economists proposed the creation of an institutional structure inside of the planned economy made up of economic units that will work according to the goal of increasing profits through market competition. The economists also wanted to fundamentally transform the incentive structure of the planned economy by making it less reliant on direct administrative measures and more

¹²⁸ Johanna Bockman, page 109-110

¹²⁹ Ibidem, page 111

¹³⁰ Ibidem, page 109

on indirect coercion and “economic mechanisms”. The vision of the reform economists was partially realised in 1969 with the rolling out of the “New Economic Mechanism” Janos Kornai, the main theoretician behind the theory of the economic mechanism, identified four direct and indirect “levers” inside of the national economy, the four indirect ones are: the wage fund, the monetary system, the price system and investment, the four direct ones were the central planning commission, the system of material allocation, state regulation of foreign trade and the central allocation of administrative personnel.¹³¹ The “New Economic Mechanism” abolished the mandatory output requirements and plans, it devolved economic authority to the enterprises and the state relinquished its control over foreign trade, the administrative structure of the firm was also drastically changed making it so that the firm could independently decide its suppliers and make it so that profits would have been the main driver of economic success. The economists were inspired by Oskar Lange’s defence of the socialist system when drafting the economic reform, but they also viewed the overreliance on hierarchical institutions such as the Central Planning Board or the industrial ministries as fundamentally recreating a “capitalism without capitalists” for this reason they pushed for a greater emphasis on the creation of a competitive market, without the hierarchical institutions of a planned economy or the capitalist firm.

The reforms had the effect of enhancing the standards of living of the people and increase GDP per capita, the commitment of the communist party to continuously increase living standards was a response to the crisis of consent that it sustained in 1956 after the failure if the application of Stalinist planning. The system continued to function in the years from 1968 to 1975, but the Oil Crisis of 1973 and the rising dependence on western credit markets for the financing of its import scheme because the country to ultimately had to face a crisis of capital formation and rising levels of debt that ultimately led to the fall of the Hungarian People’s Republic in a nonviolent way in 1989¹³².

According to the economists imbued in the international neoclassical debate of the 70’s and 80’s the old system of a bureaucratic planned economy created constituted a stage

¹³¹Ibidem, pages 111-114

¹³² Janos Kornai, “Paying the Bill for Goulash Communism: Hungarian Development and Macro Stabilization in a Political-Economy Perspective.” *Social Research* 63, no. 4 (1996): 943–1040.

of development of the socialist system which was then supposed to be superseded by either a Yugoslav kind of decentralized planning mechanism through workers councils, or a market socialist system¹³³. The development economists of the time thought that the structure of the planned economies of the Stalinist kind amounted to a kind of institutional equilibrium that while stable did not produce an optimal result leading to underperformance. For the economists of the time, market socialism or Yugoslav type planning, was the higher equilibrium point that was supposed to be achieved by pushing through a big enough packet of reforms that would create an institutional structure that guaranteed economic competition and mechanisms to incentivize the growth of the economy¹³⁴.

The main obstacle for the reformist economists were the communist parties and economic elites of the countries, which could undermine the objective of the reform packet by stalling their full implementation. This was seen as a real danger since as we will see in the section, the bureaucrats, and political elites of the country after experimenting with partial market reforms returned to a Soviet-type centrally planned economy.

3.2.2 Khrushchev, the Kosygin - Liberman Reform and Ogas

The Soviet Union was the leading socialist country in the Warsaw Pact, it was also the largest and powerful economy of the Eastern Block, by 1964 the country had passed through a period of turmoil and the growth of the Soviet Economy had slowed down . After the death of Stalin in 1953 there was a power struggle inside of the party for the election of the next general secretary, Nikita Khrushchev became the leader of the country, the general secretary decided to initiate a period of political and economic reform aimed to decentralize the administrative and political structures in the USSR by creating in the economic sphere regional planning clusters known as Sovnarkhozy.¹³⁵ The main rationale behind Khrushchev's move was the attempt to reduce the bureaucratization and to reign in the excesses of Stalinist planning. This could be seen

¹³³ Johanna Bockman, pages 176-180

¹³⁴ Ibidem, pages 180-187

¹³⁵ Alec Nove , An Economic History of the USSR 1917-1991, Penguin Books, page 351-353, 1992

by the establishment of multiple new ministries after and the subsequent expansion of responsibilities for individual ministries¹³⁶ away from the Moscow centre, in the field of agriculture central control was relinquished from the ministry of agriculture.¹³⁷ Under the period of the seven year plan there was a chronic crisis in planning which then became the motor behind the “Kosygin-Liberman Reform”, the detailed orders of the plans drafted in the centre were translated by enterprises in a variety of ways, anecdotal evidence in Soviet Union is rich of examples such as Chandeliers that were made too heavy to be fixed on the roof of houses, trucks that had to do useless trips in order to fulfil the quota of kilometres done, sheets of steel that were made too thick to be used by the engineering industry due to the requirements of the plan to produce a certain tonnage of steel sheets, the tendency to avoid introducing new techniques since the temporary disruption would not allow the enterprise to reach its quota and many more.

The reforms of the Sovnarkhozy done by Khrushchev made the situation even worse. The centrally planned economy under Stalin focused ruthlessly on the production of producer goods, and the system worked reasonably well when all it had to care about was the fulfilment of the plan for single sectors, but the increasing complexity of the soviet economy and the increased importance given to other economic sector stretched the investment budget thin causing delays also due to a lack of coordination between the different planning institutions, the result was the enlarging of the bureaucracy, due to the need to coordinate different state-led endeavours.¹³⁸

With the ousting of Khrushchev in 1964 came the period of Brezhnev, the new soviet leader was welcomed since with his return the soviet planning system once again regained a coherence that was being shattered by Khrushchev continuous reorganizations, with the commanding heights of the economy being once again managed by the industrial ministries instead of the Sovnarkhozy¹³⁹. With the advent of Brezhnev as general secretary, Alexei Kosygin became the president of the council of ministries, he was one of the more reformist minded members of the Politburo and in 1965 pushed for the Kosygin-Liberman reform, which introduced for some selected state firms the existence of an internal revenue fund of which it could freely dispose of,

¹³⁶ Ibidem, page 350

¹³⁷ Ibidem, page 334

¹³⁸ Ibidem, pages 364-369

¹³⁹ Ibidem, page 378

increased managerial responsibilities, incentives to increase productivity and the substitution of planned economic indicators with the profitability of the enterprise, the managers of the firms were also given the authority to decide their own levels of investment, procurement, wage fund, and pay incentives¹⁴⁰¹⁴¹. The reform launched in 1965 was gradually retired, due to the pressure of the bureaucratic and administrative apparatus, as well as a congenital diseases, the reform both enhanced the power of Gosplan and the ministries while also leaving greater autonomy to the enterprises selected for the rollout, creating an incoherent packet that favoured the status quo.¹⁴² The desire to not let the reform work through were seen by Brezhnev as he reinstated the Gosnab, the ministry for allocation of resources in 1965, the same year of the reform creating redundancy between the newly increased managerial and firm responsibilities. Another element which conspired against the reform were the plant directors and ministries which did not enjoy the new-found responsibilities as they withdrew material support and procurement deal from those firms¹⁴³. In 1970 few of the increased responsibilities assigned to the designated state firm managers remained.

The most interesting reform proposal came from the “Economic Cyberneticists” a field of cybernetics that could only be found in the Soviet Union, the group of informatics, mathematicians, economists, and scientists adopted a technocratic platform for reform¹⁴⁴. They wanted to save the command economy by expanding the possibilities of Gosplan to plan and enforce the original vision of the planned economy as a lean, streamlined, and efficient system of allocation of resources by the employment of a combination of input-output planning, mathematical methods and computers called planometrics. The field came to prominence after the publication of Norbert Wiener’s book “Cybernetics: Or Control and Communication in the Animal and the Machine”, the book inspired a complete revolution in the sciences of the Union¹⁴⁵. The main architect behind the reform proposal was Victor Glushkov, he is considered the father of information theory in the USSR and developed a project called Ogas, abbreviation of

¹⁴⁰ Ibidem, page 382-384

¹⁴¹ Benjamin Peters, pages 65-67, 2018

¹⁴² Central Intelligence Agency, SPECIAL REPORT, KOSYGIN PROPOSALS FOR REORGANIZING SOVIET ECONOMIC MANAGEMENT, 1965

¹⁴³ Alec Nove, page 67, 1992

¹⁴⁴ Benjamin Peters, pages 67-70

¹⁴⁵ Ibidem, pages 44-48

National Automated System for Computation and Information Processing, that if it were completed would have completely automated the process of planning in the Union. Ogas was a project for the creation of an All-Union telematic infrastructure that would have connected the production sites to computer clusters via landlines providing the planners access to real-time information and the ability to resolve problems as they emerged along the production line, as well as employ qualitative data such as worker surveys¹⁴⁶.

The solution of the cyberneticists was effectively an answer to the information problems in the Soviet Union, the objective of Stalinist planning was the transformation of the planned directives into actual economic output, the problem was “solved” by local ministries creating their own plans and standards that then had to be communicated back to the planning authorities, but that in many cases were not compatible with the economic measures of other industries, for example the economic indicators of the wood processing industry alone was 800 pages long¹⁴⁷, this alongside ministerial “empire-building” and interministerial competition for funding and resources produced the process of vertical arbitration between the various parts of the economic machine of the USSR which made the planning process highly incoherent¹⁴⁸¹⁴⁹. This was combined by the lack of ability of central planners to access local information, a problem already highlighted by Hayek in the calculation debate.

The cyberneticists with their proposal sought to actualize the planned economy by making it live up to the standard of what it was supposed to be, an actual responsive system for the needs of everyday people, while simultaneously reducing the bureaucratization of the USSR and keeping Gosplan on the steering wheel and not bargain or fight for the actualization of its will. Ogas would have simultaneously centralized, decentralized, automated, and streamlined the planning process.

Despite the growing interest in employing cybernetics in economic planning the various ministries actually wanted to employ computerization for their own goals, the day in which the Ogas was presented to the Politburo on October 1st 1970 two key members

¹⁴⁶ Ibidem, pages 109-114

¹⁴⁷ Ibidem, page 62

¹⁴⁸ Ibidem, pages 72-77

¹⁴⁹ Eugene Zaleski, pages 75-82

were missing, Brezhnev and Kosygin, both of whom favoured the implementation of the system, Brezhnev favoured it because it promised to change the planning system of the Union while being relatively apolitical and his engineering background, Kosygin favoured it because he saw it as the next best thing after the slow death of his reform¹⁵⁰.

The meeting of the Politburo had the then minister of Finance Vasily Garbuzov turn the meeting against Ogas. Garbuzov was the main opponent of the Ogas because he saw the possibility of losing control over the part of its prerogatives to Ogas and Glushkov, he also wanted to manage the project for his own benefit against his rival the director of the central statistics administration Vladimir Starovsky, who also saw in Ogas a grave danger, as the automated systems of the proposal would render him and his administration obsolete, he was not opposed in principle to computerization but he hoped to shape it in its favour¹⁵¹. The Ogas proposal was drastically reduced in scope and applied only to a limited number of clusters and technical applications.¹⁵² Despite never being technically phased out Ogas never managed to become the Soviet Internet and to reduce the coordination and information problems faced by the command economy.

¹⁵⁰ Benjamin Peters, pages 160-162

¹⁵¹ Ibidem, pages 163-165

¹⁵² Ibidem, pages 166- 180

Chapter 4: Industrial Policy

4.1 Definition of Economic Planning

In order to not confuse planning with command economies or industrial policies in general I will now introduce this definition to differentiate the two processes. By Economic Planning I mean a process through which governments establish a system of control and direction over the allocation of resources through computational means in an iterative process, by setting output targets e.g. quotas, or by means such as indicative planning, in which governments coordinate public and private investment in accordance to forecasts, enabling the state to correct informational mismatches in the economy.

4.2 Industrial Policy

Today countries worldwide are scrambling to develop new policies that encourage productivity growth, one the ways they are doing this is by developing industrial policies. Industrial policy is a type of framework that encourages structural transformation of the economy, it uses instruments ranging from public procurement, incentives, tariffs and direct command and control mechanisms as well as indicative planning to correct market failures. Historically, it has been employed by both developed and developing countries. In this section I will discuss the industrial policies applied in the East Asian context, looking at Japan and the People's Republic of China.

4.3 The Japanese case

Japan has had a rich history of devising interventions to develop new sectors and incentivize productivity growth. In the 20th century the country achieved incredible rates of growth, a period known as the Japanese economic miracle lasting from the 1946 to 1992. The main success story of Japanese industrial policy is the development of the domestic automobile industry which nowadays is one of the main players worldwide. But how did they achieve this kind of success? The answer lies in the use of institutions that fostered collaboration between the state and private actors, like MITI, the Ministry for International Trade and Industry, and other factors that are constituent parts of the Japanese developmental state. The peculiarities of the political economy of Japan of the

time ranged from the horizontal structure of the Japanese post-war conglomerate centred around cross-shareholding between the various firms, the peculiarity of the financial system of Japan, where firms operate in the financial sector by employing banks with which they had close connections.¹⁵³ In the post-war boom the main banks for most corporations were city banks under the administration of the bank of Japan controlled by the ministry of finance¹⁵⁴. The labour market in Japan is also structured on three main principles, enterprise unionism, life-time employment and wages by seniority which reduce days lost to strikes as well as retaining trained workers with developed knowledge on the ins & outs of the company speeding up innovation.¹⁵⁵

Chalmers Johnson in his book identifies Japan as a “plan-rational” rational economy¹⁵⁶, to substantiate his case he points to the example of how economic bureaucrats are selected from the best universities in the country and how after retiring from governmental positions, they join the high echelons business world, a direction of elite mobility which is opposite to the United States, identified by Johnson as a “market-rational society” The state in the Japanese case performs mostly developmental functions compared to the United States where the state performs mostly regulatory functions.¹⁵⁷

4.3.1 The Japanese Miracle

The MITI and the Japanese developmental state emerged from the historical context of pre-war Japan, they started to act in a developmental and plan-rational way after the Meiji restoration. After experimenting with state-owned enterprises, they understood that the best way to achieve their goals was to employ privately owned enterprises that would comply with the national goals of economic development and national strength by being rapidly adapting foreign technology. This initiated a high level of collaboration between the private sector and the government.

¹⁵³ Erik Berglöf, Enrico Perotti, The governance structure of the Japanese financial keiretsu, *Journal of Financial Economics*, Volume 36, Issue 2, 1994, Pages 259-284

¹⁵⁴ Chalmers Johnson, *MITI and the Japanese Miracle: The Growth of Industrial Policy, 1925-1975*, Stanford University Press, page 10, 1982

¹⁵⁵ *Ibidem*, page 11

¹⁵⁶ *Ibidem*, page page 21

¹⁵⁷ *Ibidem*, pages 18-19

In the post-war boom the relationship between the private sector and the government was consolidated. To access the highest business and government institutions of the country it was necessary to partake in the classes of the top university institutions of the country. The Tokyo School of Law was the most important one and the one from which the majority of high-level figures came from¹⁵⁸. The program of the university homogenized the weltanschauung of both the government and business world, making it so that a high level of coordination was possible between the public and private sphere of the society.¹⁵⁹

4.3.2 The Bureaucracy

MITI emerged from two previous institutions the Ministry of Commerce and Industry and the Ministry of Ammunition created during the second world war, in this sense it a son of the war economy and the Showa era. This can be observed by the continuity of the bureaucratic administration, Nobusuke Kishi, the “Devil of Manchuria” was elected as the Prime Minister of Japan later in his life, and many bureaucrats retained their position in the state administration and Imperial Diet. The persistence of elements of the war economy can also be seen in the period immediately after the occupation, after the end of the war multiple reforms were enacted by the occupation authorities the most important being: the land reform, destruction of the Zaibatsus, the enactment of the right to strike and the disbandment of the military¹⁶⁰. The economic bureaucrats managed to fill in the void caused by the elimination of its traditional enemies increasing its power over the economy and civil society at large. This development is congruent with the Japanese political tradition as before the war the seat of power was never in the hands of the emperor or the imperial diet but in the military and civilian bureaucracy; similarly to the Bismarckian tradition of government in the Second Reich, the bureaucrat was not a servant of the people, but an appointee of the emperor that exercised power in his name¹⁶¹. The power of the Economic Bureaucracy is very large, in fact in Japan the rulers are not the democratic institutions but the bureaucracy, the democratic institutions

¹⁵⁸ Ibidem page 58

¹⁵⁹ Ibidem, pages 60-62

¹⁶⁰ Gao, Bai, *Economic Ideology and Japanese Industrial Policy: Developmentalism from 1931 to 1965*, Cambridge University Press, pages 123-124, 1997

¹⁶¹ Chalmers Johnson, *MITI and the Japanese Miracle*, pages 36-38, 1982

serve only as means to get feedback and exert the bureaucracy to change their policies and programs in light of the political situation¹⁶².

The bureaucracy is staffed by the highest achievers of the most prestigious universities of the country, the level of career progression that a bureaucrat can achieve is directly determined by the kind of exam that they are able to qualify for and pass, only those aspiring bureaucrats that are able to pass the “type A” exam are able to access the entire bureaucratic career, the rest that are able to pass the “type B” exam can become clerks but they can only ever aspire to become chief of a department¹⁶³. The structure of the bureaucracy is similar to those of military officers, where the officers are the type A bureaucrats, and the non-commissioned ones are the type B bureaucrats. These kinds of relationships of seniority are at the base of the relations between government workers¹⁶⁴.

The ministries in Japan were usually the place of covert struggle between the various camps of the bureaucracy, the only true political appointment is the minister himself, which is chosen by the Prime Minister, the rest of the staff are senior members of the bureaucracy, which are incredibly jealous of their autonomy, as they think that are acting in the name of their ministry first and only after they are servants of the nation¹⁶⁵, as such their main fear is the subordination of the ministry to political directives, which is manifested by the struggle of Ichino Kono to control the agriculture ministry, fundamental for the LDP due to the strong overrepresentation of the rural vote in the imperial diet¹⁶⁶.

4.3.3 The Priority Production System

In the period from 1945 to 1952 the government had the strongest hold over the economy, they frequently employed measures such as direct price controls, capital controls and direct transfers. The priority production system was imposed, during the period from 1946 to 1949 the Japanese economy under the direction of the Economic

¹⁶² Ibidem, pages 45-48

¹⁶³ Ibidem, pages 58-59

¹⁶⁴ Ibidem, pages 56-57, 65-67

¹⁶⁵ Ibidem, page 74

¹⁶⁶ Ibidem, pages 53-54

Stabilization Board (ESB)¹⁶⁷. The organ was created to tackle the multi-tiered crisis of material procurement, the fall in industrial production and hyperinflation. The ESB had unprecedented power and was defined by the bureaucrats as the moment in which it held the most authority, the ESB directed through command-and-control mechanisms the production of coal, iron, steel, and fertilizer. To reduce the shortage of these materials, the Japanese state employed two different tools. One was the plan regarding the demand and supply of resources, which was effectively the same as the annual plan of material mobilization during World War II. The other tool used was tight control over the allocation of resources, the state drafted and implemented the Law Concerning Temporary Adjustment of Resources between Supply and Demand, which replaced the National General Mobilization Law in October 1946¹⁶⁸. The economic bureaucracy engaged in both macro and micro level management of the entire economy by directing financial resources to these sectors through the Reconstruction Finance Bank. Different trade associations were created to set production and distribution quotas similar to the process of loan syndication commonly used during the war¹⁶⁹.

The policies were put in place because it was thought that by reducing the profit incentive the pervasive speculation on the black markets would be reduced, helping reign in rampant hyperinflation. The policies were supported by many schools of thought surprisingly both the Japanese Marxist economists such as Uno Kozo as well as economists associated with the managed war economy of the thirties and forties supported the turn of event of 1946-49. During this period, the rationale for reconstruction was based on the ideas of the Marxist economist Arisawa, who thought that the production of industrial goods at all costs was the way to go to save the national economy, the increase in production would have caused a reduced rate of inflation in the long run and permitted an intensification of the production of consumer goods afterwards.¹⁷⁰ Arisawa thought that irrespective of the troubles the priority production system would have created in the field of economic inequality and political stability, the state had to assume the role as the main arbiter of the economy, a pattern that will remain in the history of Japanese industrial policy. At the same time the Keynesian

¹⁶⁷ Gao, Bai, *Economic Ideology and Japanese Industrial Policy*, page 124.

¹⁶⁸ *Ibidem*, pages 129-132

¹⁶⁹ *Ibidem*, pages 131-134

¹⁷⁰ *Ibidem*, pages 136-138, 141, 145

economist Ishibashi was in favour of instituting a policy of easy money through the utilization of the Reconstruction Finance Bank to stimulate capital formation¹⁷¹, despite the insistence of the Marxists to adopt a non-expansionary monetary policy due to fear of inflation, the policy was adopted by the ESB. The implementation of both Ishibashi's and Arisawa's proposal caused a spike in inflation, but at the time it was perceived as the only policy that could inject capital and jump-start the underemployed and trembling Japanese economy.¹⁷²

The ESB joined an elevated level of autonomy from the newly formed democratic government institutions as it rubber-stamped the budget proposals of the economic bureaucracy, another factor that will remain constant in the history of Japanese Industrial Policy.¹⁷³

In the end the priority production system managed to restore some level of production, but it would not be until the 50's and 60's that the Japanese miracle would begin.

4.3.4 The Dodge Plan, liberalization, and the birth of MITI

In 1950 the economic situation of Japan required profound readjustment, the allied authorities up until that point had supplied Japan with hard cash to pay for its government expenditures adopted a plan for economic and inflationary stabilization called the Dodge Plan, the plan included the creation of a fixed exchange rate of 1 dollar to 360 yen and the cessation of all injection of dollars into the Japanese economy¹⁷⁴, the "Dodge Line" created a stabilization panic as the immediate cessation of all lending caused a famine of capital for national recovery, the main priority of the government became the procurement of cash to achieve trade balance parity, end the stabilization panic and try to achieve economic independence¹⁷⁵. This caused the merging of two ministries, the Ministry of Commerce and Industry and the Ministry of Agriculture into the Ministry for International Trade and Industry, which will become the main base of

¹⁷¹ Ibidem, pages 138, 147-152

¹⁷² Ibidem, pages 150-151

¹⁷³ Ibidem, page 154

¹⁷⁴ Ibidem, pages 176-177

¹⁷⁵ Ibidem, pages 177-179

power of the Japanese Economic Bureaucracy over the national economy¹⁷⁶. The first approach of the Japanese was the utilization of its natural endowments of cheap labour, but due to the lack of competition, a design of the priority production system, the quality of goods was poor and hourly wages in the Japanese textile industry, the main exporting industry at the time, were as much as 7 times lower than their western counterparts¹⁷⁷. To re-establish their competitiveness internationally, the Japanese sought to embark on a campaign of intensified capital investment in basic industries to achieve technological parity with the rest of the industrialized world. The Priority Production System was changed significantly, the principle of avoidance of competition and suppression of the profit motive was replaced by the strategic character of Industrial policy in which excessive competition would be curtailed to favour the strategic objectives of the developmental state.

The Japanese bureaucrats thought of competition in a Schumpeterian way, the main objective of innovation, they thought, was not the competition through price wars, but the development of new production methods and products. They also went against the mainstream since one of their objectives with industrial policy was the “construction” of their own comparative advantage through Heavy-Chemical industrialization¹⁷⁸. The revision of the monopoly law in 1949 and 1953 allowed companies to create cartels and take common action, as well as allow intercompany shareholding, the move allowed the Zaibatsus to reconstitute themselves in the Keiretsu. Cartels were encouraged for two reasons, to utilize capital more efficiently and reduce “excessive competition” in a move to rationalize capital utilization¹⁷⁹. The characteristic that made the Keiretsu conglomerates such as Mitsubishi ideal for the developmental state of Japan, was the fact that the centre of the company was the bank which provided the main means for business financing, and most of the times the banks were city banks under the control of the minister of finance, the city banks would usually the different industrial enterprises “over loan” from the city banks and the city banks would overborrow from the central bank. The financial sector of Japan was so structured in a way that was congenial to the objectives of the economic bureaucracy, as the two-tiered system of “city-banks” and

¹⁷⁶ Ibidem, page 179

¹⁷⁷ Ibidem, page 178

¹⁷⁸ Ibidem 180-181

¹⁷⁹ Ibidem, pages 183-184

banks of last resort which included the Japanese Development Bank gave the economic bureaucracy a high level of direct control over the economy,¹⁸⁰ through preferential lending as well as through the central bank which was the arbiter of the entire system through its extension of loan privileges to the city banks as well as being the controller of dividend rates. The conglomerates were incentivized to not resort to auto-financing through the stock market, the dividends of shareholders were given out after taxation over the industrial profits, whereas loans were often tax deductible, creating an incentive structure to not go astray and respect the MITI guidance to avoid financial crisis¹⁸¹, if a company was not able to procure the necessary capital for its operations through the city banks then the Japanese development Bank would come in granting a long-term loan at a low interest rate to finance the firms operation¹⁸², it managed to procure its funds by utilizing the postal savings service of Japan, achieving a high rate of capital formation and reinvestment.¹⁸³

Another change that occurred to the priority production system was the removal of the direct command and control mechanisms, and their replacement with the institution of a system of preferential treatment to firms that comply with the policy objectives of the Ministry of International Trade and Industry. The state also had a tight hold over the hard cash needed for its balance of payments, the Law Regarding Foreign Exchange and Foreign Trade established that all foreign currency earned by private companies through exports must be given to the government, and that the hard cash allocated for imports or other activities was to be controlled by the quota established by the Japanese government,¹⁸⁴ the law also gave the state total control over the allocation of imported technologies, the system remained in place until 1964. The system had the effect of both making efficient use of the limited hard currency of the Japanese state and to reduce the inflow of imports that would damage the industries that the Japanese state wanted to develop to achieve its objective of economic independence. At the same time the trading companies were centralized from 2800 to 20 in a process that can be defined as

¹⁸⁰ Chalmers Johnson, *MITI and the Japanese Miracle*, pages 200-203

¹⁸¹ *Ibidem*, pages 203-204

¹⁸² *Ibidem*, pages 210-211

¹⁸³ Chalmers Johnson, *MITI and the Japanese Miracle*, pages 208-213, 237

¹⁸⁴ Gao Bai, *Economic Ideology and Japanese Industrial Policy*, pages 182-183

“Keiretsuification” of the trading companies as they struggled to be awarded the contracts of the various industrial conglomerates.¹⁸⁵

The rationalization of production also meant the shift of conflictual relation between labour and capital, in the 1950’s there was tremendous industrial and productivity growth, but a high level of unemployment, the bureaucracy sought to resolve the contradiction between capital and labour by integrating the working class in the management process, Japanese firms started importing American engineers and management specialist and adopt modern management techniques inside of the Keiretsus¹⁸⁶, workers were guaranteed as a compromise, long term employment, job security and seniority bonuses that are still nowadays constitutive of the Japanese labour market. The management system of Japan then took a life of its own managing to create the famous total quality control system, as well as later variations such as the kaizen system applied inside of the Toyota Corporation.

The main stimulus that the Japanese economy received in the early 1950’s was the arrival of several waves of U.S. dollars and industrial expertise in the form of procurements to jump-start the military industry, the injection of hard currency and new technology, through technology transfers allowed Japan to balance its payments and proceed with a policy of export orientated growth on a renewed technical basis in the machining industry.¹⁸⁷ The Korean War was another moment in which the Developmental state was at a crossroad, it could either decide to pursue a policy of development through rearmament and join the Cold War and link itself with the United States as a main partner and market or it could choose a policy of national independence and exclude itself from the Cold war, in the end Japan chose to side with the United States,¹⁸⁸ but it did not manage to achieve its program of development through rearmament due to a variety of reasons: firstly there was interministerial infighting over who should have lead the development program, secondly the nature of development through rearmament was limited, since it was conceived in a time of great international tension between the two blocks and finally the division between the business leaders

¹⁸⁵ Chalmers Johnson, *MITI and the Japanese Miracle*, pages 205-206

¹⁸⁶ Gao Bai, *Economic Ideology and Japanese Industrial Policy*, pages 186-188

¹⁸⁷ *Ibidem*, pages 193-195

¹⁸⁸ *Ibidem*, pages 195-203

was another factor that stunted the proposal from taking shape due to the general distrust in the defence sector after the Second World War¹⁸⁹.

4.3.5 Finally High-Speed Growth

All of the previously listed features of the Japanese developmental state were the basis for its future success. MITI through its careful use of its resources, the competency matured over the years of the war and managed economy as well as their utilization of the greatest minds of the Japanese state managed to engineer an industrial transformation of the country, were they managed to shift the economy of the country from one relying mostly on textiles to one that had as its main staple the production of high value added goods.¹⁹⁰

The policy of moving the comparative advantage from the labour-intensive industries to machining, engineering, automotive and chemical industries can be explained by their focus on Schumpeterian competition, for the economic bureaucracy the notion of efficiency in western capitalist countries, the greatest amount of profit in the shortest time possible, was directly in contradiction with the objective to change the industrial structure of the economy.¹⁹¹ This was also reflected in the desire of the bureaucrats to achieve full employment through the elimination of the “dual-track” economy, where more than 40% of workers were self-employed and mostly concentrated in the pre-modern sector characterized by small and micro-businesses and low salaries, at the same time in Japan existed the modern sector based on manufacturing and the employment of mass production and dependent labour¹⁹². In 1957 a plan was drafted to increase internal consumption by modernizing the premodern sector and transform the small enterprises into medium sized ones, increase productivity. The gains of the productivity drive were then shared between the cleavages in society, maintaining it stable to achieve a high level of economic and productivity growth¹⁹³.

The creation of a new industry was a competence of MITI, it had a strategic role in promoting and protecting the infant Industry, by giving it a preferential treatment

¹⁸⁹ Ibidem, pages 203-206

¹⁹⁰ Ibidem, pages 210-211

¹⁹¹ Ibidem, pages 206-212

¹⁹² Ibidem, pages 212-214

¹⁹³ Ibidem, pages 214-220

through access to foreign currency, assigning it the designation strategic so that it can access preferential access to land, credit as well as key tax breaks on specific key raw materials and machinery.¹⁹⁴

The last institution that MITI created to create the conditions for high growth was the creation of the JETRO, Japan External Trade Organization, which provided detailed market analysis to MITI so that it would be able to target industries designated towards the production of exports¹⁹⁵.

Between 1955 and 1970 Japan achieved a sustained an average rate of growth of more than 10% per year¹⁹⁶, the policies of MITI were instrumental in the creation of the Japanese Miracle as well as its industrial transformation, from a nation that relied on its cheap labour for exports to a modern high value-added country. The National Income Doubling Plan, the main project of MITI in the 60's is emblematic of this, in the 60's the MITI transformed once again the system of Japanese Industrial Policy by creating an environment conducive to managerial and technological innovation, the state through its role as a guide formulated national goals that would then mobilize the economy, as it was in the case of the petrochemical and automobile industries.¹⁹⁷

4.3.6 The Lessons of Japan

The lessons that can be drawn from the Japanese experience are multiple, the most important one is the need for industrial policy to actually be able to have a highly skilled ministerial workforce that is able to connect itself with the business world and shape market competition, the second most important one is the need to identify the target industries and through administrative and non-administrative measures to protect the infant industry and make it succeed. Thirdly the need to integrate the various social cleavages in policy design, so the different ministries, the business owners, and the workers.

¹⁹⁴ Chalmers Johnson, *MITI and the Japanese Miracle*, page 236

¹⁹⁵ *Ibidem* pages 230-232

¹⁹⁶ *Ibidem*, page 237

¹⁹⁷ Magaziner, Ira C. "JAPANESE INDUSTRIAL POLICY: SOURCE OF STRENGTH FOR THE AUTOMOBILE INDUSTRY." In *The Japanese Automotive Industry: Model and Challenge for the Future?*, edited by Robert E. Cole, 79–86. University of Michigan Press, 1981.

4.4 The Chinese Experience with Industrial Policy

After looking at the Japanese case I will now focus on China and its experience with Industrial Policy. Socialism with Chinese Characteristics is the ruling economic ideology in China, it is at the same time a product of its Maoist past and the reforms done by Deng Xiaoping in the 70's after the disaster of the "Great Proletarian Cultural Revolution". The Chinese economy managed to successfully shift from the command economy to a state-directed market economy, after the introduction of the Household Responsibility system in 1978.

4.4.1 A Little History of Price Regulation in China

Chinese economics has a long history, this autochthonous development can be seen by two major treaties of the Imperial era, the "Discourse on Salt and Iron" and the "Guanzi" these treaties were written during the Warring states era and concerned themselves with the best practice regarding the regulation of the prices of commodities. During the warring states era (475-421 B.C.E.) two big changes occurred: the centre of economic life shifted from the land-owning elite to the peasant family and there was the "Iron Revolution", meaning that the utilization of agricultural instruments made of metal became commonplace¹⁹⁸. According to the officials of the Guanzi, the state should employ "light-heavy principles," light-heavy principles refer to the process of price movements and how they come about, the officials identify various causes of price movements, they talk about: concentration of wholesalers economic power, the relative scarcity of the goods and the time frame of taxation, the fall of the value of the currency and demand shocks.¹⁹⁹ The most important price of all is the one for grain, which had to be carefully managed by the authorities to avoid damaging either farmers, through low prices or the country at large, with high prices. The price of grain also influenced the general price level, so the prince had to be both responsive and skilful, the prince should manage the general price level of grain through both procurement and monetary policy, when there was an oversupply of grain the state would mint coins and buy a certain amount so to achieve both currency devaluation and an increase in the price of

¹⁹⁸ Isabella M. Weber, *How China escaped Shock Therapy: The Market Reform Debate*, Routledge, pages 19-21, 2021

¹⁹⁹ *Ibidem*, pages 21-24

grain balancing a deflationary tendency, the opposite would happen in times of scarcity. Market participation by state authorities reduced both inequalities derived from unequal land distribution and provided funds for the state without damaging excessively private interest.²⁰⁰ In the first years of the Han Dynasty a debate formed after the death of Emperor Wudi, he had supported in his life the policies of the Guanzi and instituted a public monopoly over the salt mines and iron workshops as a way to solve a deep financial crisis²⁰¹. In 84 BCE Two schools of thought formed during this economic debate, the bureaucrats and the literati's, the bureaucrats thought the policy of the late emperor were the path forward for China, whereas the bureaucrats thought that the policies were a degeneration of Chinese traditional Confucian life²⁰². The Literati's auspicated for the state to remove its monopolies and return to the previous order of tax in kind and subsistence agriculture. The Debate was won by the bureaucrats wo argued for the continuation of the policies also on the basis that the natural monopolies of salt and iron to bring common prosperity needed to be in the hands of the state, as otherwise they would have fallen inti the hands of profiteers that would not share the benefits of the mines and salt fields.²⁰³ The outcome of the debate shaped imperial China's economic policy to its fall during the Xinhai revolution of 1911.²⁰⁴

4.4.2 China under Mao

In 1949 the Communist Party of China, defeated the Kuomintang or Nationalist Party, its immediate goal was the restoration of the value of the currency, the success of the communists to control hyperinflation stabilized their rule at the end of the civil war and it has been attributed as one of the main factors that allowed them to garner popular support.²⁰⁵ The policies implemented by the communists in the two years after their rise to power also became the basis on which the liberalization debate of the 1970's and 80's began.

²⁰⁰ Ibidem, pages 24-27

²⁰¹ Ibidem, pages 29-31

²⁰² Ibidem, pages 30, 32-33

²⁰³ Ibidem, pages 30, 33-34

²⁰⁴ Ibidem, pages 34-37

²⁰⁵ Ibidem, pages 69-70

During the second world war due to the economic blockade of the Japanese, the deprivation of the peasantry and mismanagement by the nationalists, the Chinese economy began to suffer a rapid rise in inflation, the situation was aggravated when the nationalists to pay their international debt began printing money at an ever-increasing speed²⁰⁶. The economy was also afflicted by the collapse of market integration, the collapse of both domestic agricultural output and imports as well as rampaging speculation by part of the capitalists.²⁰⁷

The approach of the communists became known as “Economic Warfare,” it was connected to the guerrilla warfare waged by the communists in their base areas. Initially the CPC tried to restore the value of the currency through administrative measures such as direct price controls and the banning of nationalist currency in the red bases, but they proved to be ineffective. Taking a page from the Guanzi the communists realized that to stabilize the currency and take over the nationalists economy they needed to harness the market’s forces in their favour, combining their armed struggle with the economic one²⁰⁸. This meant using the grain requisition system, the fiscal and monetary policy of the bases and local commodity production to back the communists currency instead of precious metals.²⁰⁹

The strategy of controlling market forces was then re-utilized by the communists once they won the civil war. State retailers engaged in direct competition with private speculators, state retailers had a series of list prices that were set by the government, while the private market was still plagued by hyperinflation. To counteract hyperinflation and bring the price level down to the list of government prices, the state retailers would buy goods en masse and once the private market exhibited signs of abrupt price increases, the retailers would release the previously bought goods driving down speculation. This move by the communists combined with the resumption of production and the pegging of the wages to the price of basic commodities managed to

²⁰⁶ Ibidem, pages 71-72

²⁰⁷ Ibidem pages 72-73

²⁰⁸ Ibidem pages 77-78

²⁰⁹ Ibidem pages 78-79

give the newly established Renminbi a high degree of trust, ending hyperinflation and re-connecting the Chinese economy²¹⁰.

After price stabilization the Maoist economy followed a pretty similar path to the Soviet one indicated by the adoption of the first five-year plan, the communists promoted a system of agricultural cooperatives and communes that should have been self-sufficient for their own consumption and supply agricultural goods to the burgeoning industrial sector at state prices.²¹¹ The strategy was inspired by the Soviet Union's own path to development, but in this case the process was non-violent and did not require the excesses of the Soviet collectivization²¹². The main problem of the commune was that it imposed agricultural austerity and forced savings so to expand production on a newly mechanized basis, this had negative effects on peasant consumption, but it fulfilled the role that the planners had in mind, to foster industrialization through investments in agricultural production and industry²¹³. Mao's approach to the collectivization question though was extremely different compared to Stalin's, the CPC decentralized administrative and economic authorities to the commune, in direct contrast to the Soviet's tendency of overcentralisation²¹⁴ and it managed to achieve some impressive developments in the rural economy by expanding irrigation as well as developing some limited rural industrialization.²¹⁵

The urban economy of the People's Republic was a copy of the Soviet model of material balances, financial targets, and direct allocation of physical products to state enterprises.²¹⁶ I shall not delve into the industrial structure of the socialist command economy any longer as it was already discussed in the previous chapters.

The last characteristic of the Maoist Economy was its high emphasis on price stability, the Communists took another page from the Guanzi, while combining it with the need

²¹⁰ Ibidem pages 80-83

²¹¹ Kueh, Y. Y. "Mao and Agriculture in China's Industrialization: Three Antitheses in a 50-Year Perspective." *The China Quarterly*, no. 187, 2006

²¹² Nolan, Peter. *Collectivization in China: Some Comparisons with the USSR*, *The Journal of Peasant Studies* 3, no. 2 1976, 192–220.

²¹³ Kueh, Y. Y. "Mao and Agriculture in China's Industrialization: Three Antitheses in a 50-Year Perspective"

²¹⁴ Jinglian, Wu, and others, 'Reforms of the Economic Administration System During the Maoist Era', *Whither China? Restarting the Reform Agenda* New York, pages 192–220, 2016; online edn, Oxford Academic, 19 May 2016

²¹⁵ Chris Bramall, *The Industrialization of Rural China*, Oxford University Press, pages 8- 47, 2006

²¹⁶ Isabella M. Weber, *How China escaped Shock Therapy*, pages 101-103

to achieve surplus extraction from the countryside. The prices were set by the central planning authorities, local party cadres had the possibility of increasing or decreasing prices based on the demand of the local urban or peasant population²¹⁷, but the prices of agricultural goods always remained low compared to the price of industrial goods. Urban prices were kept artificially low through the use of subsidies, whereas the goods that were defined as non-essential “light-goods” in the Guanzi, had a hefty price and their key role was to absorb cash flows.²¹⁸

4.4.3 The Market Reforms

After the Great Proletarian Cultural Revolution, the CPC was in a precarious situation, the Economy had not managed to catch up to the western economies, despite it being one of the main goals of the revolution. To solve this predicament the Chinese economists engaged in a debate over the future development of the Chinese economy. Deng Xiaoping was a member of the rightist faction of the CPC and saw that the starting point for economic reforms was to change the price system. The main theoretical breakthrough of the early reform era was the recognition that the “law of value,” the Marxist tenet that when a commodity is exchanged in the market, the price of the commodity on the amount of socially necessary labour time, could operate in China and guide the process of resource allocation²¹⁹. This meant removing part of the command-and-control mechanisms of Maoist administrative planning and instituting market relationships. For the reformers, the future shape of the price system should encourage the creation of incentives to maximize production, achieve a greater productivity of labour and a more rational use of resources.

In the 1980’s two schools of thought emerged regarding the question of price liberalization. The first one was composed of those economists and bureaucrats who had previously worked to change the price structure locally in their respective provinces, they adopted a policy of “planned gradualism.²²⁰” The second school of thought was composed by those who argued for wholesale liberalization of both prices and company

²¹⁷ Ibidem, pages 100-101

²¹⁸ Ibidem, pages 97-98

²¹⁹ Ibidem, pages 120 - 121

²²⁰ Ibidem, pages 122 - 26

structure, their proposals were called “packet reforms” and could be called a form of shock therapy²²¹

The package reform economists argued instead that the economy should be liberalized in an extremely fast manner, they were in contact with various eastern and western economists in the World Bank. The package reform economists argued that: since the previous attempts at market construction in the eastern bloc had failed due to the piecemeal nature of the reforms, the Chinese government should introduce radical reforms at a rapid pace so to avoid the capturing of said policies by the state authorities as a way to then reintroduce planning.²²²

By 1984 the debate was won by the gradualist which introduced a series of important reforms. In 1979 the communist party introduced the household responsibility system, in the Anhui province it was a rural reform that decollectivized the countryside and put an end to the people’s commune of the Mao era, the system achieved the goal of boosting rural production²²³, and was described by the party as a roaring success. In 1984 they also proposed the reform of the price system by creating the “dual track system” in which there were still planning indicators and quotas for the industries defined as most important by the state, but for industries that were less important to the goals of the communist party, after the quota was achieved, the enterprises could freely sell their surplus on the market²²⁴. The dual track system was fundamental in creating a system in which state-owned enterprises, used to receive production orders from the state, could experiment and adapt to market mechanisms. The reformed system also managed to maintain price stability, through the use of state trading agencies, one of the greatest fears of the leadership was the possibility of an inflationary surge which could potentially destabilize the system.

²²¹ Ibidem, pages 135-145

²²² Ibidem, pages 141 - 142

²²³ Ibidem, pages 156 - 160

²²⁴ Ibidem, pages 174 - 176

4.4.4 The Industrial Policy of China Today

Since the liberalization of the 80's China has experienced a sustained rate of growth of more than 10%²²⁵, today the state owned sector is still the prevalent player in China's plan oriented market economy, despite the creation of the Household responsibility system land is still owned by the People's republic and there is no private market for land²²⁶.

The Chinese strategy for growth has relied on export led industrialization, a large state-owned macro sectors made up of publicly controlled industrial conglomerates,²²⁷ and capital controls regulations. Chinese industrial policy compared to the Japanese one relies on the spillover effects of the large state-owned industrial sector, rather than collaboration between private conglomerates and the state. The two main institutions charged with the administration of this sector are the: National Development and Reform Commission (NDRC), an evolution of the State Planning Commission, and the State Asset Supervision and Administration Commission (SASAC).²²⁸

The NDRC manages the development of 5-year plans and annual plans for economic development, as such it is a direct offshoot of the command economy of the early PRC. As such it still exhibits some of the characteristics of the typical of the command economy such as the process of vertical bargaining between different state enterprises, ministries, and local governments, deciding the allocation of investment and making macroeconomic adjustments in response to national and international developments²²⁹.

SASAC is a holding body controlled by the state council, it controls the finances and management of state-owned conglomerates, it also overviews the process of industrial reorganization of the SOE's, it was instrumental in the process of corporatization of the SOE's, initiated in 2005, and in strengthening their role in the economy. The objectives of SASAC are the integration of the industrial structure through vertical integration as

²²⁵ Gabriele, A. and Jabbour, Socialist Economic Development in the 21st Century. Routledge, page 126, 2022

²²⁶ Ibidem, page 133

²²⁷ Ibidem, page 121

²²⁸ Ibidem, pages 181

²²⁹ Ibidem, pages 182-184

well as the enlargement of the most important SOE's²³⁰. SASAC, has a similar role to the Japanese MITI, as the main arbiter of the development of industrial policy. This can be seen by the high state involvement that is present in the industries that are assigned the "Key" label, in 2020 state revenues accounted for 83% of the entire activity of the defence, electricity, oil and gas, transport, aviation and railways sector.²³¹

The Chinese state could be classified as both an entrepreneurial state as well as a developmental one, the financial sector in China is characterized by the dominance of state banks under the direction of the People's Bank of China, the central bank, and three regulatory commission, plus a series of "policy banks" that serve the role of providing long-term funding and relieve commercial banks from this role²³². The most important player in the transformation of the economy is the China development bank which provides medium-long term funds for infrastructural projects and emerging industries.²³³ Currently Chinese export ventures utilize state funds and minority ownership to access R&D resources,²³⁴ the technological complexity of Chinese export for now is highly dependent on foreign technology, to counteract this Chinese firms have resorted to industrial agglomeration which produces spillover effects on the relevant high-technology firms by making it easier to access infrastructure, information technologies and labour.

Native technological development and innovation have also become particularly important in the Chinese context, exemplified by the launch of the ten thousand little giants campaign, a sub-plan of the Made in China 2025 initiative launched the Xi Jinping government. The state utilizes a variety of instruments to accomplish its goal of fostering local innovation, these instruments include direct subsidies, government guided equity financing targeted to specific sectors, and preferential bank lending and

²³⁰ CHEN, Z. Governing through the market: SASAC and the resurgence of central state-owned enterprises in China. A PhD thesis submitted to the University of Birmingham for the degree, pages 170-205 2017

²³¹ Ibidem, page 189

²³² Burlamaqui, Leonardo Finance, development and the Chinese entrepreneurial state: A Schumpeter-Keynes - Minsky approach, *Revista de Economía Política* 35 , 2015

²³³ China development bank_strategic priorities. (n.d.). <https://www.cdb.com.cn/English/ywgl/ghyw/>

²³⁴ Wang, J., Ziqi, Z., & Wang, H. Research on Influencing Factors of Export Complexity of Chinese High-tech Industry Based on Big Data Analysis. *E3S Web of Conferences*, 235, 2021.

preferential land allocation.²³⁵ The goal of the initiative is the development of 10 strategic sectors including advanced manufacturing, big data, artificial intelligence, IT services and electronic equipment. The initiative of the Communist Party of China has had positive effects in increasing patent production in the targeted industries²³⁶. The field in which China has had most success though is the field of renewable energy, in 2011 China produced only 7% of its electricity with renewable sources, in 2022 the figure was 16%²³⁷. The country now is also a leader in installed photovoltaic capacity²³⁸ and dominates the global solar panels²³⁹, batteries²⁴⁰, and electric vehicles market²⁴¹.

4.5 The Technological Prospects for Planning

After the fall of the Eastern Block in 1989 and the USSR two years later the prospects for a renewed interest in economic planning seemed dark, despite this in the western world the emergence of the internet and the explosion of new information technology created a new-found interest in economic planning, the main representatives of this newly formed school of thought are: Paul Cockshott and Allin Cottrell, with their book “Towards a New Socialism” and Robin Hanel and Michael Albert with their book “Participatory Economics”. This school of thought born after the popularization of the internet has been defined by Chinese economists as the “New Planning School”.²⁴² The New Planning School has been defined by its commitment to remedy the mistakes made by past planned economies, they advocate for “Democratic Participatory Planning” in which the entire population would be able to participate in the planning process through mechanisms such as economic referendums on the plans²⁴³. The representatives of this school argue that the coordination problems faced by previous planned economies can

²³⁵ García-Herrero, A. and R. Schindowski ‘Unpacking China’s industrial policy and its implications for Europe’, Working Paper 11/2024, Bruegel, 2024

²³⁶ Ibidem

²³⁷ Hannah Ritchie, Max Roser and Pablo Rosado (2022) - "Energy". Published online at OurWorldInData.org. Retrieved from: 'https://ourworldindata.org/energy' [Online Resource]

²³⁸ RTS Corporation; PVPS; IEA, , Distribution of solar photovoltaic module production worldwide in 2022, by country, Statista, retrieved 19th of May 2024

²³⁹ IEA, Trends in PV Applications 2023, 2023

²⁴⁰ MvKerracker, Collin. “China Already Makes as Many Batteries as the Entire World Wants.” Bloomberg.com, April 12, 2024. <https://www.bloomberg.com/news/newsletters/2024-04-12/china-already-makes-as-many-batteries-as-the-entire-world-wants>.

²⁴¹ IEA, Global EV Outlook 2023, IEA, Paris, 2023

²⁴² Tao, W., “New Debate on Two Economic Systems in the Information Age,” [In Chinese.], Marxism & Reality, no. 5, pages 132–37, 2009

²⁴³ Paul Cockshott, Allin Cottrell. Towards a new socialism. Spokesman Press, pages 125-127

be resolved by both adopting a standard measure of value that would replace money, in their case labour-time. The authors of this tradition show that by using labour-time as a unit of account it was feasible to draft a plan for a hundred million product economy in just 17 minutes by adopting the appropriate optimization techniques.²⁴⁴ The followers of this tradition have also proposed ways to create an incentive structure in the planned economy that would foster dynamic efficiency through innovation²⁴⁵.

Today planning though is no longer the prerogative of the socialist state, inside many firms mechanisms for non-market allocation have already been developed, Walmart and Amazon are some of the biggest employers in the world. The inventories of these two big firms have a catalogue of hundreds of millions of products²⁴⁶, and they manage to plan the entire logistical apparatus without having to resort to market prices²⁴⁷. If markets can be conceived a systems of equations, a computer can solve the system in a shorter time than any human actor could. The Technological possibilities of planning though do not stop at simple demand forecasting, the recent development of peer-to-peer production as well as the creative commons point towards the possibility of transcending market direction production of goods and services.²⁴⁸ The capitalist economies of today also present a huge amount of planning that is being done, the setting of rates of interests by central banks in many ways directs the behaviour of entrepreneurs and disciplines them. Another form of planning in the capitalist economy can be seen in the development of green finance, ESG's and their returns are calculated on the base of the Integrated Assessment Models (IAM's), IAM's are simplified models of the interconnection between the economy, society and the environment and are the basis on which green bonds are valued²⁴⁹, becoming essentially a form of indicative planning.

²⁴⁴ Cockshott, W. Paul and Allin Cottrell. "Economic planning , computers and labor values." Wake Forest Univeristy (1998).

²⁴⁵ Maxi Nieto, Entrepreneurship and Decentralised Investment in a Planned Economy, Historical Materialism 30, pages 133-163, 2021

²⁴⁶ Taylor, B. (2021, 28 luglio). Amazon Statistics: Up-to-Date Numbers Relevant for 2024. AMZScout Blog. <https://amzscout.net/blog/amazon-statistics/>

²⁴⁷ Contributor, A. W. S.). Amazon Web Services BrandVoice: Predicting The Future Of Demand: How Amazon Is Reinventing Forecasting With Machine Learning. Forbes, 3rd of December 2021

²⁴⁸ Nick Dyer-Witheford 'Red Plenty Platforms', Culture Machine, vol. 14, 2013

²⁴⁹ EBRD Evaluation Department, Approach Paper Evaluation of EBRD Green Bond Investments (2017-2022), 2023

Chapter 5: Environmental Implications for Today

After having looked at the historical examples of planning and industrial policy I will focus on the current day initiatives and the potential of industrial policy to help us alleviate climate change and reach the goals set by the Paris Climate Agreements. Planning, as we have seen, had the effect of radically transforming underdeveloped economies or to change the export structure of a country.

5.1 Recent Developments

The recent rebirth in discourse regarding Industrial Policy, can be seen as a shift in the development of contemporary capitalism, after COVID-19 many countries including the United States of America have started to adopt more direct measures to boost their manufacturing sectors, a new development in regard to industrial policy is its environmental dimension and the role that IP can have in ensuring a just transition from a carbon intensive economy to a low-carbon one.

5.2 The Rebirth of US Industrial Policy

The United States has recently passed various acts of Congress known as the Inflation Reduction, the Chips and Science act, and the Bipartisan Infrastructure Law, these new acts of congress have initiated in the US a kind of renaissance for the industrial sector, construction spending for new factories is at an all-time high, reaching 223 billion dollars in March 2024.²⁵⁰ and more than 175.000 new manufacturing jobs have been created²⁵¹. The objective of Biden's new policy is both to achieve national security through the maintenance of the US's technological advantage over its competitors and to reduce carbon emissions. The IRA introduces the ability for the government to amp its lending capacity in a variety of sectors like energy infrastructure, utility companies as well as grants for designated for low carbon sectors such as wind and solar energy grants,²⁵² credit provisions for advanced manufacturing and processing of raw materials

²⁵⁰ U.S. Census Bureau, Total Construction Spending: Manufacturing in the United States [TLMFGCONS], retrieved from FRED, Federal Reserve Bank of St. Louis; 20/05/2024

²⁵¹ U.S. Bureau of Labor Statistics, All Employees, Manufacturing [MANEMP], retrieved from FRED, Federal Reserve Bank of St. Louis, May 17, 2024.

²⁵² Loan Programs Office, Inflation Reduction Act of 2022, 22nd of September 2023, <https://www.energy.gov/lpo/inflation-reduction-act>

necessary for the transition²⁵³. The security dimension of these new kinds of investments should not be underestimated²⁵⁴, the Biden Administration and the United States in general are trying to achieve a degree of independence in regards to their supply chains and to distance themselves from China as their main provider of green tech²⁵⁵, the targeted areas of the new investment include electric RV's, solar panels and battery production, all fields in which China dominates. A very recent development of the Administration is the imposition of a series of tariffs on China regarding the obtainment of high-level technology such as advanced microprocessors, Electric Vehicles and clean energy products.²⁵⁶ This new move by the Biden-Harris administration confirms a trend already in action with the Trump presidency, that of the return of protectionism as a way to build a consensus with American industrial capital as well as to shield itself from Chinese competition. The Chinese economy right now is suffering from overcapacity²⁵⁷, as such to continuously finance its growth they need to either boost up internal demand or enlarge the trade surplus that they already have, in 2022 gross fixed capital formation accounted for 41,5% of Chinese GDP²⁵⁸, the low internal demand of the Chinese market compared to its investment means that it is difficult for China to re-orient its development strategy, and the US wants to take full advantage of this factor to contain its rise as a technological and industrial power.

Biden's policy have put the US on track to reduce its carbon emissions and partially comply with the goals of the Paris Climate Agreement²⁵⁹, despite this improvement of

2022#:~:text=The%20President%27s%20Inflation%20Reduction%20Act,energy%20manufacturing%2C%20and%20putting%20the

²⁵³ The White House, Building a Clean Energy Economy: A Guidebook to the Inflation Reduction Act's Investments in Clean Energy and Climate Action, Version 2, January 2023

²⁵⁴ Simon Evenet et. al, The Return of Industrial Policy in Data, IMF Working Papers, Working Paper No. 2024/001, 2024

²⁵⁵ Department of Energy, DOE Releases First-Ever Comprehensive Strategy to Secure America's Clean Energy Supply Chain, February 2024, <https://www.energy.gov/articles/doe-releases-first-ever-comprehensive-strategy-secure-americas-clean-energy-supply-chain>

²⁵⁶ The White House, President Biden Takes Action to Protect American Workers and Businesses from China's Unfair Trade Practices, 14th of May 2024 <https://www.whitehouse.gov/briefing-room/statements-releases/2024/05/14/fact-sheet-president-biden-takes-action-to-protect-american-workers-and-businesses-from-chinas-unfair-trade-practices/>

²⁵⁷ European Chamber of Commerce in China, Overcapacity in China: An Impediment to the Party's Reform Agenda, 2016

²⁵⁸ World Bank, World Development Indicators, Gross fixed capital formation (% of GDP) – China, retrieved from <https://data.worldbank.org/indicator/NE.GDI.FTOT.ZS?locations=CN> the 22nd of May 2024

²⁵⁹ Rhodium Group, Taking Stock 2023: U.S. Emissions Projections after the Inflation Reduction Act, 2023

the situation the current policies of the administration will not be enough to put the US on the road to net zero emissions by 2050, as such stronger measures will be required.

Up until 2023 the United States Government has had a more ambiguous approach to the green technology sector, instead it relied on nudging its massive venture capital sector towards funding the green industrial revolution. Venture Capital though is not well positioned to do the kind of investments that are needed towards the need of completely reshaping the energy mix and the industrial structure of the country, it does fund projects in their seeding stage, instead it enters into the financing of firms only after a certain degree of risk is removed either due to: the consolidation of industry in a certain market, or if the technology has already achieved a certain level of maturity.²⁶⁰ The problem of venture capitalists leaving too soon is endemic to their structure as companies, they are interested in products that can generate a return in the short-term, a timeframe that is not sufficient if an entirely new product or process of production needs to be marketed and adopted²⁶¹. Government funding is actually what pushes venture capital to invest in risky sectors such as experimental or highly capital-intensive projects such as new generations of solar power cells, or off-shore windfarms.

The US has had a long history of industrial policy and state entrepreneurship, starting from the Hamiltonian “Report on the Subject of Manufacturers”²⁶² in the beginning of the history of the United States. More recently the Government has historically been highly active in the support for the American innovation system. DARPA, the Small Business Innovation Research program as well as its network of universities are the main driver of long-range technological innovations. DARPA for example was instrumental in the development of the internet and the personal computer revolution.²⁶³ Another example of the US Entrepreneurial state is the Orphan Drug Program; through the use of certain tax incentives, clinical as well as R&D subsidies, fast-track drug approval and strong intellectual and marketing rights for products developed for treating rare conditions, the government managed to commercialize various drugs that, due to

²⁶⁰ Marianna Mazzucato, *The Entrepreneurial State: Debunking Public vs Private Sector Myths*, pages 136-142

²⁶¹ *Ibidem*, pages 54-57

²⁶² Harold C. Syrett, *The Papers of Alexander Hamilton*, vol. 10, December 1791–January 1792, Columbia University Press, pp. 230–340, 1966

²⁶³ Marianna Mazzucato, *The Entrepreneurial State: Debunking Public vs Private Sector Myths*, pages 80-85

their nature of being highly specific and targeted to individuals suffering from rare pathologies, would not have been commercialized otherwise.²⁶⁴ The US entrepreneurial state in general pushes for radical innovations that would shape the development of markets forward as it is trying to do with nanotechnology through the national nanotechnology initiative,²⁶⁵ something that was not considered commercially viable in the 90's but now has a multibillion dollar market and is expected to grow very fast²⁶⁶.

These examples reported in Mazzucato's work show the nature of so-called innovation systems. The main determinant of technological development according to her is not R&D expenditure itself, but the way it is distributed inside of the economy, and the connections that are present between sectors, firms, research institutions and the public sector, and how that kind of connections influence the distribution, adoption and kind of innovation that is produced and whether it can be commercialized. A crucial component of this way of analysing innovation is the direction that is given to it by economic dynamics and the public sector.²⁶⁷ Innovation meant in a Schumpeterian way, so the development of new products, production techniques etc. depends also on the ability of learning by doing, there are strong feedback loops associated with firms level innovation, a characteristic that can also be observed globally with the emergence of the knowledge economy, which tends to be highly labour intensive, in direct contrast with neoclassical assumptions of the direction of technology being influenced by the relative cheapness of the factors of production.²⁶⁸

As I have discussed in this work the United States have already shown the capabilities to direct the flow of technology through the utilization of state policy. The main challenge that will be present for the United States is the transformation and the implementation of new tools for the development of an industrial policy that can guarantee their role as the main economic power of the western world while simultaneously reaching their green transition goals in the civilian sector. The main

²⁶⁴ Ibidem, pages 87-90

²⁶⁵ Ibidem, pages 79-80, 90-92

²⁶⁶ KBV research, "Global Nanotechnology Market Size, Share & Industry Trends Analysis Report By Type (Nanodevice, and Nanosensor), By Application, By Regional Outlook and Forecast, 2023 – 2030", 2023

²⁶⁷ Ibidem, pages 90-92

²⁶⁸ Antonelli, Cristiano & Feder, Christophe, The new direction of technological change in the global economy, *Structural Change and Economic Dynamics* 52, 2019

target of industrial policy has been the military sector spurred by national security challenges like in the case of the Sputnik crisis of the early cold war. The US has historically put on track two different innovation systems: one for the military that has had years of experience in the prototyping drafting and producing new products and technologies, and one for the civilian sector, which has been more disconnected, and it supports technological development mostly in the seeding stage of development.²⁶⁹ This gap between the innovation systems needs to be bridged if the US wants to maintain its status as a global superpower.

Recently an initiative launched by the department of energy has been expanded, it is called Advanced Research Projects Agency–Energy (ARPA-E), it is modelled explicitly after DARPA of the department of defence, it could be seen as one of the ways in which the USA is trying to bridge the overmentioned gap, with its commitment towards the development of radical innovation, development of technology industry is unlikely to pursue and the translation of scientific discoveries in actual technological products while at the same maintaining a risk-taking attitude. The Agency’s director should also have discretionary powers over which projects it should continue funding and provide an environment conducive to the attraction of world-class talent.²⁷⁰

After having looked at the United States and their instruments of industrial policy today, I will look at the EU and how it is responding to its own challenges.

5.3 The EU and its current paradigm

Europe like its American counterpart has recently started to rediscover industrial policy as a tool, it could be said in light of recent initiatives that the European Commission is aspiring to become the executive of a “developmental network state,”²⁷¹ with its objective to rapidly ramp up technological development in Europe as well as its pursue for open strategic autonomy.²⁷² The main instruments that are employed in the EU are

²⁶⁹ William B. Bonvillian, *Emerging Industrial Policy Approaches in the United States*, Information Technology, and Innovation Foundation, 2021

²⁷⁰ National Academies of Sciences, Engineering, and Medicine. *An Assessment of ARPA-E*, The National Academies Press, pages 21–46, 2017

²⁷¹ Di Carlo, Donato, and Luuk Schmitz. “Europe First? The Rise of EU Industrial Policy Promoting and Protecting the Single Market.” *Journal of European Public Policy* 30, no. 10, pages 2063–96, 2023

²⁷² European Commission, *Strategic dependencies and capacities*, Staff Working Document 352, 2021

those that mobilize private capital in a “derisk” financial investment, as such there is an element both of continuity and rupture with the previous approach of the Commission, mainly relying on levelling the field between the different national economies of the Union.

The Union was motivated to reintroduce industrial policy elements in its framework after recognizing the various points of failure present in its supply chain after the Covid-19 Pandemic, especially so in the case of Microchips, the lack of which seriously damaged the German car industry²⁷³. The Russo-Ukrainian war as well as the shifting dimension of globalisation have created an environment no longer defined by an attitude of increasing gains, but a zero-sum mentality.²⁷⁴ The drafting of trade dependency analytics by the European Union is also a sign of a growing need to re-shore or friend shore production of critical supply chains such as semi-conductors, rare earths and green technology²⁷⁵. This was also an effect of the “Kuka Shock” where Chinese conglomerate Midea Group bought the advanced robotics manufacturer Kuka group²⁷⁶. The acquisition caused alarm in both German and French industrial leaders, and was the catalyst for the creation of the combined “Franco-German Manifesto for a European industrial policy fit for the 21st Century”²⁷⁷

5.3.1 Legal Basis of Industrial Policy in the Union

Currently Industrial policy is a prerogative of the European Union, but it is not an exclusive responsibility as in the case of the Single Market, it is a coordinating competence as established in article 6 of the “Treaty on the Functioning of the European

²⁷³ Riham Alkousaa, Chip shortage in Germany's car industry will last years - Audi manager, Reuters, August 11, 2023, <https://www.reuters.com/business/autos-transportation/chip-shortage-germanys-car-industry-will-last-years-audi-manager-2023-08-11/>

²⁷⁴ Tyson, L., Zysman, J., & Judge, B. The New Logic of Globalization: Uncertainty, Volatility, and the Digital Economy. BRIE Working Paper 2023-4.

²⁷⁵ European Commission, Strategic dependencies and capacities, Staff Working Document 352, 2021

²⁷⁶ Braw, Elisabeth, "Cutting-edge tech takeovers are a strategic threat to the west", Financial Times, October 7, 2019

²⁷⁷ Olimpia Fontana and Simone Vannuccini, “ How to institutionalise European industrial policy (for strategic autonomy and the green transition)”, LUISS Institute for European Analysis and Policy, Jean Monet centre of Excellence on EU Inclusive open Strategic Autonomy, Working Paper 7/2024, 2024

Union”, so national laws in this case cannot be harmonized.²⁷⁸ The peculiarity of EU industrial policy is its supranational character, the EU needs to coordinate twenty-seven different national economies, with distinct levels of economic development and industrial competencies. The harmonization of the different economies can as such result quite difficult if the EU wants to avoid regional inequalities. The legal body that has authority in the matters of industrial policy is the European Commission.²⁷⁹ The Commission can introduce policies that increase the competitiveness of European industries, by either speeding up the adjustment of the industrial structure, facilitating the coordination of different undertakings through modifications of the environment in which they operate, and fostering technological development. The main obstacles to the implementation of permanent European Industrial Policy as such are political in nature.

The countries in the European Union have a long history of Industrial Policy, one of the most ancient ones is the “Marriage of Iron and Rye” of Imperial Germany²⁸⁰, while a more recent one was the French system of indicative planning applied during the “Trente Glorieuses” and beyond²⁸¹. Even in the past the political character of industrial policy was clear, as it was a move to develop national champions to spur development in the country of reference.

The Industrial policy of the European Union is composed by three parts, the competition policy of the EU, the internal market, and the technology policy according to Franco Mosconi.²⁸² In the cited paper Mosconi argues for the creation of “European Champions” a policy proposal that recalls Europe past of building up national champions through state policy instruments. He argues that the formation of supranational European undertakings are not in principle against the competition policy enshrined in the European treaties, as there is already the possibility of allowing the

²⁷⁸ Consolidated version of the Treaty on the Functioning of the European Union, OJ L. 326/47-326/390; 26.10.2012, European Union, 26 October 2012,

²⁷⁹ Ibidem

²⁸⁰ Ha Joon Chang, *Kicking away the ladder: Development strategy in historical perspective*, Anthem Press, pages 32-35 2007

²⁸¹ Martin Cave and Paul Hare, *Alternative Approaches to Economic Planning*, The MacMillan Press LTD, pages 69-83 1981

²⁸² Franco Mosconi, *The Rise of «European Champions» in the Single Market a First Assessment*, The European Union review, Vol. 11, N° 1, pages 29-60, 2006

mergers of different undertakings if the benefits derived from the economies of scale are large enough to compensate for the loss of competition.²⁸³

Previous cooperation has relied on climate policy has relied on the derisking of investment activities, making it easier for private capital to invest in clean technology. Essentially it focused on the role of the state as an instrument to correct market failures, through instruments such as private-public partnerships and targeted fiscal and monetary policy to push the financial sector in a direction that is useful to the goals of today without endangering the role of the financial sector as the main instrument of capitalist accumulation.²⁸⁴ This dimension of derisking continues today and it is being employed as the main motor to enforce financial and industrial discipline inside of the European Union. The nature of the financial markets of the European Union is strongly connected to institutional actors, for example sovereign bonds are the main financial instrument used as a collateral in the repo market of the EU.²⁸⁵

5.3.2 European Level Coordination

European coordination in the industrial sector is not a new phenomenon, one of the main products of this sharing of competences, technology and industrial equipment has been the realization of the Galileo System and the formation of the European Space Agency. Some instruments that could be used by the EU to form a common industrial policy are already present, such as the IPCEI initiative, the European Innovation Fund, the Invest EU initiative, and New Generation EU. These instruments have been characterized by their temporary dimension, their specificity, and the fact that in most cases most of these instruments rely on intergovernmental cooperation. The Union still

²⁸³ Guidelines on the assessment of horizontal mergers under the Council Regulation on the control of concentrations between undertakings, Official Journal C 031 , 05/02/2004 P. 0005 – 0018, European Union, 5th of February 2004

²⁸⁴ Daniela Gabor, The (European) derisking state, in "Stato e mercato, Rivista quadrimestrale" 1/2023, pp. 53-84,

²⁸⁵ European Securities and Market Authority, EU Securities Financing Transactions markets 2024,

does not have a unified strategy for industrial policy, instead it relies on a patchwork of initiatives that encompass numerous fields of EU Policy²⁸⁶.

IPCEI (Important Projects of Common European Interest) is an instrument created in 2018 that facilitates brokerages between different national units to conduct capital and knowledge intensive operations that produce positive spillover effects over the entirety of the Union,²⁸⁷ capital for these projects comes from both the public and the private sector. More recently the EU with its Next Generation EU initiative has begun to directly finance these projects. The various waves of IPCEI projects have been involved in areas such as battery, micro-electronics, Hydrogen, and green energy production.²⁸⁸ The Union for these kind of designated investments actually makes an exception for the state aid, allowing significant levels of public finance and participation²⁸⁹, a sign that already in 2018 they were conscious of the need to develop strategic capacity to achieve the policy objectives set by the Commission.

There are other instruments that are employed by the Commission to let both private and public investors access finance, those instrument comprehend the European investment bank, which grants long-term loans for the development of sectors designated by the union to receive procurement loans, stimulating both public and private capital, and the European Innovation Fund employed by the Union specifically for the purpose of developing climate friendly technology, the two of them form the European Investment Bank Group.

The European Investment Bank is the main instrument used for the financing of more risky investments while still adhering to the stability and growth pact, relying on its own resources rather than union or member states funds.²⁹⁰ The European Investment Fund

²⁸⁶ Olimpia Fontana and Simone Vannuccini, “How to institutionalise European industrial policy (for strategic autonomy and the green transition)”, LUISS Institute for European Analysis and Policy, Jean Monet centre of Excellence on EU Inclusive open Strategic Autonomy, Working Paper 7/2024, 2024

²⁸⁷ European Commission, State aid: Commission adopts revised State aid rules on Important Projects of Common European Interest, November 25th, 2021

²⁸⁸ Andreas Eisel, EU industrial policy in the making. From ad hoc exercises to key instrument: how to make IPCEIs fit for the long run, Policy paper, Jacques Delors Institut, 2022

²⁸⁹ European Commission, State aid: Commission adopts revised State aid rules on Important Projects of Common European Interest, November 25th, 2021

²⁹⁰ Griffith-Jones, Stephany, and Natalya Naqvi, Leveraging Policy Steer? Industrial Policy, Risk-Sharing, and the European Investment Bank, in Daniel Mertens, Matthias Thiemann, and Peter Volberding, *The Reinvention of Development Banking in the European Union: Industrial Policy in the Single Market and the Emergence of a Field*, 2021

is the other instrument employed by the Union to finance SME projects and climate friendly ventures, its major shareholders are the European Investments bank and the European Commission, and periodically releases audits to get funding for marketing and developing green projects, the projects are financed through the revenues of the Union's cap and trade system.²⁹¹ The scaling up and full roll out is managed by other parent programs such as invest EU. The overcited institutions are fundamental in the building of the EU developmental Network State (DNS), that is a type of developmental state that tailors its activities towards the promotion and the development of the knowledge economy and high-tech sectors. Compared to the old type of developmental state, it tries to foster these kinds of development through horizontal links between the various partners instead of relying on a policy of choosing winners or more direct policy interventions.²⁹² This can be seen by the numerous initiatives launched to support an elevated level of funding for the creation of a venture capital market in the EU which is behind the US in terms of sheer quantity of investments.²⁹³

The EU has also acted in a way to disincentivize the utilization of carbon intensive energy resources. It has done so through its cap-and-trade scheme of the EU emission trading system. This last Union proposal was devised to incorporate what are known as market externalities. Environmental damage through carbon emissions does not appear on the firm's balance sheet, as such the cap-and-trade system incentivizes firms to make more environmentally friendly decisions by scaling up their green operations. The system was effective in reducing carbon dioxide emissions²⁹⁴ but not in fostering the required low-carbon technological change required by the Commission.²⁹⁵

The main problems that industrial policy faces in Europe are: 1) the possibility of heightening regional inequalities inside of between the member states, for example

²⁹¹ European Commission, What is the Innovation Fund? Available at: https://climate.ec.europa.eu/eu-action/eu-funding-climate-action/innovation-fund/what-innovation-fund_en#progress-report, retrieved 27/05/2024

²⁹² Sean O Riain, *The Politics of High-Tech Growth: Developmental Network States in the Global Economy*, Cambridge University Press, pages 26-36, 2004

²⁹³ Maria Demertzis and Lionel Guetta-Jeanrenaud, Europe's venture capital boom: a new breath of life for entrepreneurship? Bruegel Blog, 10 February 2022

²⁹⁴ Antoine Dechezleprêtre, Daniel Nachtigall, Frank Venmans, The joint impact of the European Union emissions trading system on carbon emissions and economic performance, *Journal of Environmental Economics and Management*, Volume 118, 2023

²⁹⁵ Rahel Mandaroux, Kai Schindelhauer, Houdou Basse Mama, How to reinforce the effectiveness of the EU emissions trading system in stimulating low-carbon technological change? Taking stock and future directions, *Energy Policy*, Volume 181, 2023

IPCEIs by their nature very large can have the effect of undermining the competition policy of the Union making the single market less competitive, the nature of the state aid regulation applied to these projects also tends to cause a subsidy race between the participants, entrenching the dominance of certain member states over the others.²⁹⁶²⁹⁷

2) Its overreliance on the mobilization of private capital, without any imposition of administrative punishment, we could say that at the EU level, instead of employing both the carrot and the stick, they are just using the carrot. This means that most of the benefits that will arise from the success of the newly financed companies will remain in the private sector without giving enough to the state and institutional actors financing the development of these undertakings, a situation that Mazzucato warns about.²⁹⁸

5.4 Industrial Policy Today: some Observations

After having looked at a variety of cases throughout history, I will now talk about the potential that industrial policy has today for hastening the transition. There are some general patterns throughout history that can be observed if one wants to develop a coherent industrial policy.

- 1) Planning, even in its more heavily bureaucratic and inefficient forms, has been able to transform the industrial structure of entire economies, through targeted resource allocation.
- 2) To work effectively it needs a competent bureaucracy that is receptive to the needs of the nation and its economic situation.
- 3) The innovation system of an economy needs to support the development of innovative technologies from basic R&D to the marketization of new products.
- 4) A political coalition is needed to support the development and rolling out of a coherent industrial policy.

²⁹⁶ Andreas Eisl, Important Projects of Common European Interest (IPCEIs) as a New Form of Differentiation: An Analysis of Their Challenges for the European Single Market

²⁹⁷ Government of Sweden, Smart and selective use of the IPCEI instrument, Regeringskansliet. 10th of September 2021 Available at: <https://www.government.se/articles/2021/09/smart-and-selective-use-of-the-ipcei-instrument/> (Accessed: 25 May 2024).

²⁹⁸ Marianna Mazzucato, The Entrepreneurial State: Debunking Public vs Private Sector Myths, pages 195-199

- 5) Considering the local dimension of technological development and the strong regional feedback loops that are present in the economy, the state is the ideal institution that can direct the development of technology: be it a more capital-intensive approach to industrialization or the transformation of the energy mix of a nation.

Globalization today poses a new set of challenges to developmental states and industrial policy more generally, as Dani Rodrik outlined in its influential 2004 paper²⁹⁹, industrial policy today should not be a question of accurately choosing winners but rather develop an institutional structure in which actors could discover the relevant information needed for the development of sound policy proposals.

Industrial policy should tackle a variety of issues, the innovation system of the country, the structural characteristics of the economy, the demand component for the new innovations, the direction of technological development and the political dimension of the interventions.

Climate change is looming as an existential threat over the future of mankind if the current emission pattern continues: we will not be able to stay in line with the objectives set by the Paris climate agreement.³⁰⁰ The link between capitalist development and fossil fuel usage has been shown very extensively by Andreas Malm's books and articles on the concept of fossil capital - capitalism's life up until recently has relied on the consumption of fossil fuels to propel its growth.³⁰¹ We are talking about a 200 years of path dependent technological development. The sunken costs of the entire energy grid of every single developed country are massive, as such there is a huge element of technological and institutional inertia that needs to be overcome if we are to reach the climate targets. The amount of money that needs to be invested is simply too large to rely solely on private capital³⁰², the abatement of costs can only happen if developments in new, even if risky climate friendly technologies are undertaken, for example BECCS,

²⁹⁹ Dani Rodrik, *Industrial Policy for the Twenty-First Century*, CEPR Discussion Paper Series, 2004

³⁰⁰ Jefim Vogel & Jason Hickel, *Is green growth happening? An empirical analysis of achieved versus Paris-compliant CO2-GDP decoupling in high-income countries*, *Lancet Planet Health* 7, 759 -769. 2023

³⁰¹ Andreas Malm, *The Origins of Fossil Capital: From Water to Steam in the British Cotton Industry*, *Historical Materialism* 21.1, 15–68, 2013

³⁰² Peter Lovegrove, *\$12 trillion to be spent on renewables and grid infrastructure in the U.S and Canada by 2050 – Report*, DNV News, September 25th, 2023, available at: <https://www.dnv.com/news/-12-trillion-to-be-spent-on-renewables-and-grid-infrastructure-in-the-u-s-and-canada-by-2050-report-247391/> (accessed 30/05/2024)

Bioenergy Carbon Capture and Storage or new generations of solar panels. Here again the state should act to massively increase investments in the modernization of the energy grid and create battery capacity for renewables. As argued before the state is also the institutional actor that needs to set the direction of technological development to achieve strategic goals. Considering the current lack of sufficient investments in decarbonization, the state should pursue the role of expanding its involvement in the energy sector, creating more renewable capacity and phase out environmentally damaging power sources, even through the use of state-owned enterprises to help fasten the transition, alongside the traditional instruments of tax exemption and preferential financial procurement. The new instruments of industrial policy proposed by Rodrik, such as networks of deliberation councils between the government and private actors, should also be used to correct informational and coordination failures between private actors.

Industrial policy to work needs to have competent bureaucrats that engage with the reality on the ground, discipline market actors into complying with policy directives, have a bird-eye view of the national economy and are interested in economic development.³⁰³ The state should also be able to impose its will on the bureaucracy, despite being a vertical organization its commands do not arrive uncompromised to the actors, this is a classic problem of principal-agent relationships which was prevalent in the case of the Soviet command economy and its process of vertical arbitration. The Japanese economic bureaucracy is an example of a coordinated bureaucracy that while still being self-interested, also served as public servants in the interest of the nation's goal of economic development.

Green industrial policies like those that are currently being rolled out in the EU and United States of America are not going fast enough, as analysed before they are mainly reliant on the willing participation of the private sector, stronger measures are needed. In 2022 a report by the McKinsey Global Institute has been estimated that to achieve the net-zero transition in 2030 the global economy should invest an additional 3.5 trillion dollars annually, most of the money would have to be invested in the power generation

³⁰³ Ha-Joon Chang, *Industrial policy: can we go beyond an unproductive confrontation?* Annual World Bank Conference on Development Economics 2010, *Global: Lessons from East Asia and the Global Financial Crisis*, World Bank Publications, pages 83-109, 2011

sector, while the rest should be invested in industry, retrofitting buildings, powerlines and de-carbonizing transportation networks.³⁰⁴

One of the other possible objectives of industrial policy today is the creation of good jobs, it has been estimated that the transition towards a green economy, while destroying jobs in the fossil fuel industries, will in the end be able to generate more jobs than it destroyed.³⁰⁵ Rodrik also highlights that one of the future objectives of industrial policy is directly connected to the question of the generation of good jobs. Traditionally good jobs were those that through wages, benefits etc. guaranteed a middle-class standard of living, the expansion of employment in manufacturing was the traditional instrument for increasing the size of the middle class. The increased productivity of manufacturing through labour saving technical change has made this possible avenue of expansion of middle-class lifestyle, if not impossible, extremely hard, as even in the context of southeast-Asian economies the share of employment from manufacturing is falling even if real value added is increasing³⁰⁶. The objective of creating good jobs may be combined with the industrial restructuring of environmentally polluted areas and the building of a political coalition. Industrial policy is an inherently political act as the previous chapters on the Soviet economy have shown, the ability to steer the development of the country depends on the strength of the political authority and the coalition of agents in charge of the state. As such industrial policy cannot be separated from the politics of the country and its citizens. The main opponents of green industrial policies are the representatives of “old money,” oil, gas, coal, steel, cement companies, large agri-businesses, their investors, shareholders and in many cases the workers that are employed in these industries. Many of these workers are employed in so called “left-behind places,” those spatial arrangements exhibit deindustrialization, deterioration of productive capacity and locked-in productive activities with low complexity, as a result bad jobs, reduced employment chances and bad wages are the norm. The ILVA implant in Taranto is one of the paramount examples of this configuration³⁰⁷. Industrial policy as such should also help with the transition of these areas through the restructuring of the

³⁰⁴Mekala Krishnan et. Al., The net-zero transition: What it Would Cost What It Would Bring, McKinsey Global Institute, 2022

³⁰⁵ Net Zero by 2050 A Roadmap for the Global Energy Sector, IEA, May 2021

³⁰⁶ Dani Rodrik, An Industrial Policy for Good Jobs, The Hamilton Project, September 2022

³⁰⁷ C. Bez M. E. Virgillito, Toxic pollution and labour markets: uncovering Europe's left-behind places, LEM Working Papers 2022/19, Scuola superiore Sant'Anna, 2022

industrial conglomerates present in the area and incentivize the creation of good jobs and spurring the development of small and medium enterprises to enlarge employment opportunities also as a way to strengthen support for similar policies in other, non-left behind places. Coalition building is an inherent part of every political action and industrial policy should pursue the goal of strengthening the political coalition that sustains it, through targeted interventions in the quality of life of its citizens.

The last element of industrial policy that should also not be underestimated is the demand dimension of the intervention, if the innovation sector manages to roll out a revolutionary piece of technology but there is no demand for it then, the research would have been for nothing. The state should intervene to incentivize or regulate new codes of conduct that are favourable to the introduction of climate-friendly technologies. Like in the case of tax exemptions for the instalment of solar panels. In some cases, there will also be the need to completely re-shape a territory, for example if we want to incentivize the introduction of electric cars and disincentivize the use of internal combustion engines we need to replace the previous infrastructure with the new one. In general, the interventions to be effective will have to rely on the cooperation between local authorities and actors and will also have to be sector and even process specific to incentivize the demand for specific products targeted by industrial policy.³⁰⁸

Chapter 6. Conclusion

³⁰⁸ Joyashree Roy et al., Demand side climate change mitigation actions and SDGs: literature review with systematic evidence search, *Environmental Research Letters*, Volume 16, Number 4, 2021

The object of this thesis was to shed light on the history of planning and industrial policy and to use the evidence obtained from the study of previous experiences to draw parallels to the economic developments of today as a way to direct policy. I have talked about the emergence of the Soviet command economy and how it developed after industrialization debate of the 1920's, describing the interministerial competition inside of the various planning agencies of the Soviet Union. After having looked at its emergence of the command economy I analysed different reform attempts inside both the USSR and the Hungarian People's Republic of, and why some of them failed they failed, in the case of the Soviet Union, of succeeded in the case of Hungary while looking at the informational, coordination and in general economic failures in light of the socialist calculation debate. The third section analysed industrial policy in Japan and China and how they achieved the structural transformation of their economies. For Japan I analysed the role played by the bureaucracy and their rationale behind structural transformation, while for China I delved in the history of price regulation and the market reforms and concluded with the current organization of Chinese industrial policy, I conclude the section by listing some of the prospects for economic planning and coordination today in light of recent technological developments. Lastly in fourth section I saw to explain the current industrial policy initiatives put in place by both the EU and United states through the optic of their innovation systems and the current international situation, while also delving in the current methods that they are employing to achieve policy goals. I conclude the fourth section with some considerations on the role that Industrial Policy has today, its requirements and the steps needed to make it successful.

After having looked at a variety of historical experiences with planning and industrial policy, we can see that the state has an incredible role to play if we want to complete the transition from a carbon intensive economy to a net-zero one. The previous experiences have in many cases been flawed in their development despite having reached the goals that they subscribed to. Despite its past failures and discreditation, economic planning is becoming once again attractive for policymakers worldwide, the recent debates at the US and European level have seen a rebirth in the discourse surrounding industrial policy as a tool for economic growth and development, recent international developments and a tense international situation have made it clear that it is going to

stay as a tool utilized by countries to reach specific policy goals. As such industrial policy and planning should be viewed not as instruments that should be left in the toolbox because too ideologically inconvenient, but as the tools that will allow us to overcome the current climate crisis and carve a path towards sustainable development.

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