

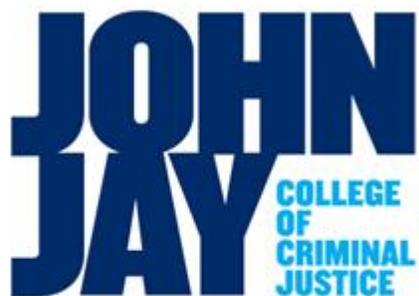
DEPARTMENT OF ECONOMICS

Working Paper

Climate Policy from a Keynesian Perspective

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Working Paper 2022-01



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May 2, 2021

ABSTRACT: An important divide in debates over the economics of climate policy is between those who take a price-centered view, in which the problem is essentially the need to correctly price an externality, and those who take an investment-centered view, in which decarbonization requires a central role for direct public investment. While the former was formerly dominant in policy debates, calls for what is sometimes called a Green New Deal have more recently elevated the second view. In this paper, I argue that this investment-centered approach is consistent with a broader Keynesian vision of the economy. In this vision, supply constraints are elastic and endogenous; increasing returns, coordination problems, and fundamental uncertainty make markets unsuitable to organize major transformations of the economy; and the role of finance is to provide liquidity rather than allocate savings. From this Keynesian perspective, the fundamental constraints on decarbonization are not real resources, but planning capacity and distributional conflict.

Climate change is perhaps the greatest challenge of our times. Few today disagree on the need for immediate action to reduce carbon emissions. But there are deep divides over what kind of action is called for, involving not just judgements about what is likely to be practically effective, but fundamentally different conceptions of the problem to be solved.

To an economist, one division stands out, between what we might call a price-centered versus an investment-centered approach to climate policy. The first sees the fundamental problem as a market externality. Because the cost of carbon emissions is not incorporated into prices, we spend too much on carbon-intensive goods and services, and too little on alternatives. The goal of regulation should be to correct this mispricing; once this is done, private businesses and consumers can find the lowest cost path to decarbonizing the economy in a decentralized way. The fundamental choice, from this point of view, is how high the carbon price should be. This in turn reflects the tradeoff between reducing carbon emissions and maintaining current living standards. The faster we want to move toward our long-term climate goals, the more consumption we will have to give up in the present.

Until recently, this was the dominant perspective on the economics of climate policy. Perhaps the most prominent climate economist, William Nordhaus, who recently won the Nobel for work in this area, presents the economics of climate as exactly this: a tradeoff between current consumption and climate spending, where the key question is how to set the right price for climate externalities.¹ It was also widely accepted in the policy world. A few years ago, I was at a meeting with a senior Obama administration official, who said, “The big question I have about climate is whether a carbon tax is 100 percent of the solution, or only 80 percent.”

¹ William Nordhaus, “Climate change: The ultimate challenge for economics.” *American Economic Review*, 109(6):1991–2014, 2019.

More recently, though, a different approach to climate policy has been gaining ground, which emphasizes more direct measures to boost climate investment rather than taxes or other forms of carbon pricing. This vision of climate policy, sometimes referred to as the Green New Deal in the US or the Green Deal in Europe, sees decarbonization as a project of actively building up a low-carbon economy, with the state playing a leading role both through public investment and measures to direct private spending. This second vision rejects the tradeoff between climate goals and current living standards; decarbonization, advocates argue, need not entail austerity and sacrifice, but can help address broader issues of economic justice and overcome chronic problems of weak demand.

People may arrive in one or the other of these camps for many reasons. Advocates of the investment-centered approach tend to link climate policy to broader concerns over economic justice. Developments like the Gilets Jaunes protests in France, and more recent responses to rising energy prices in the wake of the war in Ukraine, have raised doubts about the viability of aggressive carbon pricing, making an investment-centered approach more attractive.

More subtle, but equally important, are the different underlying economic visions behind the two approaches to climate policy. It is this divide that I want to focus on. While seldom explicitly articulated in debates, different understandings of the economy are often the foundation on which more concrete arguments about climate policy rest.

In this essay I want to bring these submerged differences to the surface. In particular, I want to sketch out the radical Keynesian vision of the economy that underlies strong forms of the investment-centered response to climate. Not everyone will accept this vision, of course. But I hope that even those who reject it will see more clearly how disagreements over climate policy arise not just from different political judgements or preferences, but from alternative models of how the economy works.

Alternative Visions of the Economy

To start with, we have to understand what the Keynesian vision is challenging. Mainstream macroeconomics, respectable and common-sensical and first glance, is an odder beast on closer examination. It takes intuitions that make sense in themselves — good things are scarce; choices involve tradeoffs; people act out of self-interest — and applies them in a rigid, one-sided, and often dogmatic way.

The fundamental macroeconomic model in modern macroeconomics is of a single, infinitely-lived, infinitely foresighted “representative household,” choosing how to best divide their time between labor and leisure. This single household performs all the labor in the economy, and also owns all the capital goods; they have a given technology for turning labor into stuff, and for investing stuff today to produce more stuff in the future. And they know the true probabilities of all possible future events that might change these tradeoffs. Based on this, they can pick the path over all future time that gives them the best tradeoff between labor and consumption.

Of course there are many variations on this basic model, but they share the essential features that resources and technology are given, known, and fully utilized; the only question is what way of using them will deliver the most wellbeing or utility. People, in general, are already working as much as they are willing to, and doing the most valuable work they are capable of; the only way to produce more of one thing is to produce less of something else. In Lionel Robbins famous words, the problem of economics is the allocation of scarce means between alternative ends.

It is this conception of economics that the Keynesian revolution challenged, though did not ultimately overturn. The heart of the Keynesian vision is the idea that the central economic problem isn't scarcity, but *coordination*. Production does not just require the use of labor and other resources, it also poses immense organizational problems. Industrial production requires the cooperation of enormous numbers of people, most of whom will never meet, across many businesses and often countries, over periods of many years. (Think, for instance, of all the different decisions and activities required to

bring a new drug to market.) Modern corporations, financial institutions and governments have allowed us to cooperate on a larger scale than in earlier times, but there is an almost endless scope for further improvement. So while limits to physical resources certainly exist – this is why we are talking about climate policy in the first place – it is wrong to imagine them as adding up to an overall limit on potential output. A country may possess a certain number of acres of arable land, or a certain annual flow of potable water. But to turn these into an economic constraint, we must assume they are already being put to their most valuable use. This would be plausible in a world where a single agent made all decisions about production, using a fully-specified technology. In the real world it is less so.

The relevance of the Keynesian vision is most obvious in recessions and downturns. The fall in production and employment after a financial crisis doesn't mean that real resources have disappeared, that people have lost the desire to work, or that technology has been forgotten. It means that a complex system of coordination has broken down. The web of payments between households, businesses, governments and financial institutions involves many independent choices that may or may not be consistent with other choices, on the basis of expectations that may or may not be borne out. When this web unravels, some part of society's productive resources go unused – labor, most obviously, in the form of unemployment. Public spending in a recession doesn't crowd out private employment; on the contrary, in the familiar logic of the multiplier, it crowds it in.

In the 1930s, government officials well-trained in economics insisted that every additional job created by government would simply mean one less job in the private sector. Today, fortunately, the inapplicability of scarcity economics in a depression is better understood. But the same principles apply in the longer run too. There is no reason, in general, to think increased spending or production in one area requires a reduction somewhere else.

This does not mean there are no physical constraints on human activity – the hard limit on atmospheric carbon is the starting point for this discussion. Rather, it means, first, that these particular physical limits cannot be aggregated into a level of potential output measured in money; and second, that to the extent that there are supply-side constraints on economic activity, they are limits on the speed at which markets can reallocate labor and other resources, rather than on the level of output. In orthodox macroeconomic models, production is simply a question of combining labor and capital in certain proportions, “like a recipe for bouillabaisse where all the ingredients are dumped in a pot,” in Leijonhufvud’s memorable phrase.² The production technology that determines how much output results is exogenously given and improves in a predictable way. This implies that there is a well-defined level of potential output at any moment, and that consumption today can be traded off against consumption into the indefinite future. In the Keynesian perspective, by contrast, production is an active process in which the technology and organization develop through the economic process itself; the development of the economy over time is an open-ended historical process whose results are not knowable in advance. At any given moment, there is effectively unlimited human capacity for productive activity that is going unused because of a lack of coordination mechanisms to organize it.

This is not the place for a full defense of this view. But I will briefly lay out the kinds of arguments that may be made for it. First, observed macroeconomic dynamics, especially in recent decades, do not resemble symmetrical fluctuations around a level of normal utilizations; rather, we see sharp recessions alternating with periods of slower growth, which often break off before there is any sign of full employment having been reached.³ Related to this is the evident persistence of demand shocks, which is incompatible with the idea that modern economies normally operate near their potential. In both the US and Europe, pre-pandemic GDP was close to official estimates of potential, but far below the level implied by trends and forecasts prior to the financial crisis of 2007-2009. This

² Axel Leijonhufvud. *Capitalism and the factory system. Economics as a process: essays in the new institutional economics*, pages 203–23, 1986.

³ Antonio Fatás. “The Elusive State of Full Employment.” 2021

suggests that potential as conventionally measured is strongly dependent on actual output and demand.

This view is reinforced by empirical studies of the labor market, which suggests that estimates of available labor move with actual employment, both upward and downward.⁴ Persistent gaps between employment rates by race, gender, age and education similarly suggest large pools of potential labor not captured in official labor force measures.⁵ Beyond the non-employed, there is also what Joan Robinson called “disguised unemployment” – workers in low-wage, low-productivity sectors who could shift to higher-paid, higher productivity work if demand were stronger.⁶

More broadly, the existence of hysteresis – changes in potential output in response to actual output – raise doubts about whether the concept of potential is meaningful at all. If output gaps – positive and negative – close in significant part through adjustments of supply rather than demand, then many different paths of output will be consistent with full employment and output equal to potential. In the context of hysteresis, public spending may “pay for itself,” in the sense of generating more real resources than it claims.⁷ Historically, the mobilization for World War II offers an outstanding example of this. Military production in 1944 was equal to close to 100 percent of pre-war GDP, yet this entire increase came from incremental output, with both labor force and productivity growth accelerating in response to strong wartime demand.⁸ Similarly,

⁴ Laurence Ball and Joern Onken. “Hysteresis in unemployment: evidence from OECD estimates of the natural rate.” National Bureau of Economic Research, 2021.

⁵ J. W. Mason, Mike Konczal, and Lauren Melodia. “Reimagining full employment: 28 million more jobs and a more equal economy.” Roosevelt Institute, 2021.

⁶ John Eatwell. “Effective demand and disguised unemployment.” In J. Michie and J. Grieve Smith, editors, *Employment and Economic Performance*. Oxford University Press.

⁷ Antonio Fatás and Lawrence H. Summers. “The permanent effects of fiscal consolidations.” *Journal of International Economics* 112 (2018): 238-250.

⁸ JW Mason and Andrew Bossie. “Public spending as an engine of growth and equality: Lessons from World War II”. Roosevelt Institute, 2020.

there is reason to think that low unemployment and rapid wage growth were the cause, rather than the result, of rapid productivity growth in the late 1990s.⁹

None of this means that supply constraints do not exist. What it means is that they should be thought of as constraints on the speed with which output can adjust rather than on its absolute level. In the short run, a sufficiently large rise in spending will certainly provoke higher inflation as well as bottlenecks and shortages. But this should be understood as a temporary cost of adjustment to a new higher level of activity, rather than a sign that an absolute ceiling on production has been reached.

As development economist Ha-Joon Chang likes to point out, real processes of economic development look nothing like the smooth tradeoffs between present and future goods described by economic theory. His native South Korea is a case in point. In 1960, it was one of the poorest countries in the world – one of its main exports was human hair for wigs. Its ascent to the one of the world’s leading exporters did not come from new endowments of resources falling from the sky, nor did it involve any sacrifice of current consumption in return for faster growth – Korean living standards rose rapidly during industrialization. Rather, it came from new coordination mechanisms that greatly expanded society’s productive capabilities. Through a variety of mechanisms, the state actively channeled investment to new higher-productivity industries.¹⁰ The orthodox economics that says we cannot have rapid decarbonization without giving up current consumption, would have ruled out this sort of industrialization too.

A Keynesian Vision of Climate Economics

What does all this mean for climate policy?

⁹ Gavin Wright and William Robertson Coe. Productivity growth and the American labor market: The 1990s in historical perspective. In Paul W. Rhode and Gianni Toniolo, editors, *The Global Economy in the 1990s: A Long-Run Perspective*, pages 139–160. Cambridge University Press.

¹⁰ Ha-Joon Chang. *Bad Samaritans: The myth of free trade and the secret history of capitalism*. Bloomsbury Publishing USA, 2010.

In the first place, it means that decarbonization will be experienced as an economic boom. If we imagine the economy in terms of a fixed pot of resources to be allocated, then devoting more to climate goals must mean less for other purposes. If we think of the economy as an open-ended process of cooperation, then there's every reason to think that a big influx of new spending will mean more production of all kinds, especially if it's accompanied by new forms of coordination.

As Joseph Schumpeter famously argued, booms in capitalist economies come when new forms of production grow rapidly at the expense of old ones. Decarbonization means exactly this. Renovating buildings, investing in new structures and equipment, building infrastructure, and so on all will add to demand. The decommissioning of existing means of production does not, however, subtract from demand. Global investment in renewable energy and transmission, to take one important example, is already several times greater than investment in fossil fuel generation capacity.¹¹ The former could easily rise to many multiples of its current level, while the latter can't fall below zero. So a more rapid energy transition will certainly see higher investment in the aggregate. The same goes for other areas. A shift toward higher density settlement patterns – an important part of a lower-carbon world – will involve a period of higher housing investment, even if the total amount of housing doesn't change.

An economic boom is not just a period of faster growth, but a period in which demand is persistently strong and tight labor markets strengthen the bargaining position of workers relative to employers – what is sometimes called a “high-pressure economy.” Sustained strong labor demand leads to not only higher employment but also faster wage growth, especially for lower wage workers and those structurally disadvantaged. It is now widely recognized that wage inequality is strongly dependent on labor market conditions. Faster wage growth can lead to rises in both productivity growth and in the wage share – the fraction of income going to labor rather than capital. The extraordinarily tight labor markets of World War Two offer a clear illustration: Almost

¹¹ International Energy Agency, World Energy Investment 2021. www.iea.org/reports/world-energy-investment-2021/executive-summary

without exception, the war years saw the greatest compression of incomes on record.¹² Strong post-covid demand for labor is having a similar effect today. In the US, with wages in the bottom 25 percent of the distribution are rising – as of February 2022 – nearly twice as fast as those in the top quartile.¹³

It's important to distinguish here between the transition and hypothetical endpoint. The world of 50 or 100 years from now may well involve less market activity, less time spent in paid employment, and lower or even negative growth in wages and GDP as we currently measure it. A world with more opportunities for creative expression, participation in public life, and time with family and friends could be experienced as one of material abundance even with far less of the carbon-intensive activities we currently measure as “the economy.” But however we imagine life in the distant future, any path to a different world will require large outlays of money, the bigger the faster we traverse it. And in our world of chronic demand constraints, that implies faster measured growth and higher incomes during the transition.

The second major implication of the Keynesian view of the economy is that there is no tradeoff between decarbonization and current living standards. The idea that there is a hard tradeoff between current consumption and decarbonization rests on the assumption that there is no meaningful slack in today's economy, and that workers are already engaged in the highest-productivity activity they are capable of. There is no reason to think this is true. The workers engaged in, say, expanding renewable energy capacity are not being taken away from equal-value activity in some other sector. They are, in the aggregate, un- or underemployed workers, whose capacities would otherwise be wasted; and the incomes they receive in their new activity will generate more output in demand-constrained consumption goods sectors. War mobilization offers an example: Despite stories about wartime sacrifice and austerity, in countries that were

¹² Walter Scheidel. *The great leveler: Violence and the history of inequality from the Stone Age to the twenty-first century*. Princeton University Press, 2017. See also voxeu.org/article/inequality-total-war-great-leveler.

¹³ Federal Reserve bank of Atlanta Wage Growth Tracker. www.atlantafed.org/chcs/wage-growth-tracker. Accessed March 16, 2022.

untouched by the fighting, civilian consumption actually rose. In the US, for example, the increase in military spending between 1940 and 1945 was equal to 70 percent of total prewar GDP. Yet over this period, working class Americans enjoyed rapidly rising living standards.¹⁴

Another reason why decarbonization need not come at the expense of current living standards is the prevalence of increasing returns. Conventional economic models assume that production normally takes place under conditions of rising marginal costs – each unit of output costs more than the last one. But in real industries, per-unit costs falling as output rises. Again, World War II offers especially dramatic examples. In 1942 the US aircraft industry produced at the fairly consistent rate of 3.2 worker hours per pound of airframe. At the start of 1943, the Aircraft Production Board predicted that could be reduced to 2.2 hours per pound. But by 1945, the industry was producing at a rate of 0.47 worker hours per airframe - labor productivity had risen by a factor of nearly seven in just three years.¹⁵ This is an extreme case. But learning-by-doing seems to be almost universal in industry – the production process itself is the best source of knowledge about potential improvements. In one famous example, the Horndal steelworks in Sweden showed a steady 2 percent annual productivity growth over a 15 year period in which no new investments of any kind were made.¹⁶ Even in the course of construction of a single high-rise building, later floors typically take less time to build than earlier ones.¹⁷

Increasing returns fundamentally change the economics of decarbonization. In a conventional model, substituting sustainable for carbon energy production, for example,

¹⁴ Andrew Bossie and J. W. Mason, “Public Spending as an Engine of Growth and Equality: Lessons from World War II.” Roosevelt Institute, 2020.

¹⁵ Sarah Jo Peterson. 2013. *Planning the Home Front: Building Bombers and Communities at Willow Run*. University of Chicago Press.

¹⁶ William Lazonick and Thomas Brush. "The “Horndal Effect” in early US manufacturing." *Explorations in Economic History* 22.1 (1985): 53-96.

¹⁷ Roberta Pellegrino, Nicola Costantino, Roberto Pietroforte & Silvio Sancilio. “Construction of multi-storey concrete structures in Italy: patterns of productivity and learning curves,” *Construction Management and Economics*, 30:2 (2012), 103-115

means replacing a lower cost technology with a higher-cost one, and the cost disadvantage of the sustainable technology will only get worse as its share of production rises. This implies that decarbonizing energy production will require devoting more resources to energy production than we otherwise would. In a world of increasing returns, by contrast, a new technology may initially face a cost disadvantage but will see that narrow or disappear as it is more widely adopted. It is no secret that costs for many forms of renewable energy have fallen steeply as their scale has grown. In the US, for example, the cost of solar power construction fell by half between 2013 and 2019, while the pace of capacity addition doubled.¹⁸ In a conventional model, lower-carbon technologies must be more expensive than existing ones, since otherwise they would already have been adopted. But an industry increasing returns is path-dependent, with multiple equilibria, which technology is cheaper depends on the choices we've made.

A third major implication follows from the first two: There is no international coordination problem in climate policy, because the countries that move fastest on climate will reap direct benefits.

The mainstream view is that international “free riding ... lies at the heart of the failure to deal with climate change.” Individual countries bear the full cost of decarbonization measures, in this view, but only get a fraction of the global benefits, so countries that do not engage in decarbonization can free-ride on the efforts of those that do.¹⁹ It follows that binding international agreements are an essential precondition for effective climate action. This makes sense if you think that the benefits of climate change mitigation are global, but require a costly diversion of real resources, and especially if you think of it mainly in terms of carbon taxes. From a Keynesian perspective, however, while coordination problems are ubiquitous, this particular one should not be a concern. It is true that countries that take an early lead in decarbonization will contribute to a global

¹⁸ US Energy Information Administration, “Average U.S. construction costs for solar and wind generation continue to fall,” 2020. <https://www.eia.gov/todayinenergy/detail.php?id=45136>

¹⁹ William Nordhaus. “Reflections on the economics of climate change.” *Journal of Economic Perspectives*, 7:4 (1993), 11–25.

public good. But investment-centered action on climate will not impose costs on their domestic economies. In the first place, aggressive decarbonization will boost domestic demand, leading to faster growth. Second, many decarbonization policies are likely to have co-benefits (to public health, for example) that outweigh their costs and will be realized at a national level. In these cases, rather than facing an international coordination problem, action on climate change can be seen as helping overcome political obstacles to policies that are already in the nation's self interest.²⁰ In these cases, rather than facing an international coordination problem, action on climate change can be seen as helping overcome political obstacles to policies that are already in the nation's self interest. Third, early investment in decarbonization will generate a persistent advantage in strategic industries.

While these claims run against the textbook economics of climate change, they are consistent with the way these questions are discussed in policy settings. The central macroeconomic problem facing China, in the eyes of many observers, is how to sustain rapid growth while shifting away from exports toward domestic demand. While this is often framed in terms of raising consumption by Chinese households, decarbonization spending would serve the same goal. Meanwhile, few if any observers in the rest of the world see state support for China's wind, solar and battery industries as public-spirited shouldering of the costs of the climate crisis. Rather, they are seen as strategic challenges which other countries, in their own national interest, must seek to match. This vision of strategic competition is inconsistent with a textbook model of trade driven by comparative advantage. But it fits newer models of trade which, like the older traditions of dependency theory, see international specialization as path-dependent and endogenous rather than the product of pre-existing differences in endowments or productive capabilities.²¹

²⁰ For a good discussion of this point, see Fergus Green. "Nationally self-interested climate change mitigation: a unified conceptual framework." Grantham Research Institute on Climate Change and the Environment, 2015.

²¹ Paul Krugman. "What's new about the new economic geography?" *Oxford Review of Economic Policy*, 14(2):7-17.

None of this is to suggest that international agreements on climate policy are not desirable. The point is that it is wrong and counterproductive to suggest that the case for decarbonization efforts at a national level is contingent on first reaching such agreements. The failure of the Paris Agreements has not stopped countries like Germany from aggressively moving forward with decarbonization efforts, nor should it be an excuse elsewhere.

Market and Nonmarket Coordination in the Climate Transition

Turning from the what and why to the how, a major implication of a Keynesian perspective for climate policy: price-based measures cannot be the primary tool for decarbonization. One major reason for this is the increasing-returns problem discussed above. Private decisions are made at the margin – a bit more of this in exchange for a bit less of that. But in a world of increasing returns, the tradeoffs at the margin may not be a good guide to the full range of possibilities. Think again of fossil fuels and wind power. Not so many years ago, wind power costs were much higher than the costs of new fossil fuel power capacity. Even a very high carbon tax might not have been enough to close this gap, while imposing unacceptable hardship on consumers. Targeted subsidies for wind generation, on the other hand, were able to raise the scale of wind investment until eventually its costs fell below those of fossil fuel generation.

Similar dynamics are likely wherever increasing returns are important. The notion of a hard tradeoff between decarbonization and other needs assumes that lower-carbon technologies must be higher cost – otherwise, they would already have been adopted. With increasing returns, however, a technology may be higher cost today, but might, at sufficient scale, be comparable or cheaper than existing technologies, meaning that in the long run adopting it would not entail any sacrifice. The same logic applies to consumption. When a society's transportation system is organized around private car ownership, for example, opting for more sustainable modes may entail considerable sacrifice and, hence, would require a very large price difference. This does not mean that a society-wide shift toward mass transit and more walkable settlement patterns would

leave people worse off – but it does mean that a carbon price is unlikely to bring it about. What is needed is not incentives for people to make what is currently a very costly private choice, but rather public investment that over time will make that choice less costly.

Another fundamental obstacle to a price-based approach is coordination.²² Market signals work on the premise that each actor can take everyone else’s choices as given. But decarbonization, like other major economic transitions, requires coordinated changes by many different actors. To take a familiar chicken-and-egg problem: one of the major obstacles to widespread adoption of electric cars is the lack of charging stations. But it makes no sense for private businesses to invest in charging stations when the share of electric cars is still very low. What is needed in cases like this is a single decision maker to ensure that all sides move forward together. Again, this applies to personal choices as well as business investment. Taking the bus or a bike to work is a very different choice in a world where that’s what most people do versus in a world where everyone else is driving a car.

A third reason why market mechanisms are inadequate for decarbonization is the fundamental uncertainty posed by major economic transformations. A central theme of Keynesian economics is that economic processes are non-ergodic — that is, they take place in historical rather than logical time, and there is no rational basis for predicting many future developments in even probabilistic terms.²³ In normal times, forward-looking behavior takes place on the basis of two conventions that paper over this uncertainty — that the future will be more or less like the present, and that widely-held expectations — including, importantly, those embodied in current prices — are a reliable guide to the future. During periods of major transformations, neither of these

²² For an overview of arguments that decarbonization will require a larger role for planning rather than markets, see Max Krahe, “The Whole Field,” *Phenomenal World*, 2022. <https://www.phenomenalworld.org/analysis/climate-planning/>

²³ The notion of fundamental uncertainty as a central condition of macroeconomic dynamics is associated with American Post Keynesian economics, especially the work of Paul Davidson and Jim Crotty. For example, see Crotty, “Are Keynesian Uncertainty and Macrotheory Compatible? Conventional Decision Making, Institutional Structures, and Conditional Stability in Keynesian Macromodels,” 1994.

conventions is serviceable. When decision makers are forced to acknowledge that “we simply do not know” about relevant conditions in the future, long-lived investment may not be responsive to even large changes in current prices.

The fundamental constraint on decarbonization, then, should not be seen as the productive capacity of the economy, but rather the planning capacity for large-scale non-market coordination. The reason - to continue with the example above - that so much of the world is organized around low-density, auto-centric patterns of settlement and transportation is not that denser, more walkable, transit oriented patterns is “too expensive” in terms of any objective resource constraint. Rather, it is because moving in that direction would require coordinated action by too many different decisionmakers, public and private. This is not an easy problem to solve. But framing the problem in terms of an imaginary tradeoff between climate and other social goals will not get us any closer to solving it.

A corollary of this is that central banks’ contribution must take the form of active credit policy. Today, most proposals for climate action by central banks involve treating “green” assets more favorably than “dirty” ones.²⁴ This might take the form of differential rates lending facilities, purchasing assets or accepting them as collateral at prices adjusted for carbon-intensity, or requiring climate risk disclosure from banks and other financial institutions. Such measures are often framed as a natural extension of normal central bank policies toward financial risk, since the “dirty” assets impose greater risks, to their holders and to the financial system. Treating assets differently based on climate criteria would then contribute to the central bank’s financial stability mandate as well as the protection of its own balance sheet.

A fundamental problem with this approach is that there is no reason, in general, to think that the businesses that are at greatest risk from climate change are the same as the ones that are contributing to it. Borrowers whose repayment capacity is at risk from climate

²⁴ For a typical example, see Network for Greening the Financial System. “Adapting central bank operations to a hotter world: Reviewing some options.” 2021.

change need not be major carbon emitters. Buildings on the coast, for example, are at greater risk from sea-level rise, but emit no more carbon than structures anywhere else. Conversely there is no reason to expect the profitability of emitters to be reduced except insofar as some other policy brings this about. The conflation of carbon intensity with financial risk from climate change in effect assumes the policies to bring about decarbonization are already in place – that the only risks the central bank needs to worry about are “transition risk” to firms negatively impacted by climate policy.

From a Keynesian standpoint, central banks should worry less about the financial risks from climate change, and more about channeling credit directly to activities that contribute to the climate transition but are likely to face credit constraints. Most business investment is not especially responsive to interest rates. For larger firms, the hurdle rate for new investment appears to be high and basically invariant to market interest rates.²⁵ And for smaller borrowers constraints on how much (or whether) they can borrow are often more important than the interest rate. For example, there are many improvements to buildings that can reduce energy use and pay for themselves in a short period, but that homeowners and small property owners will be unable to carry out because of the upfront costs. Credit facilities that specifically encourage this type of investment will have a much bigger impact than across-the-board measures that, at best, will have some small effect on bond prices. In the past, central banks have supported economic development in ways that go well beyond their current roles in monetary policy and financial supervision. Their contribution to decarbonization will require overcoming the “amnesia” about these historic roles.²⁶

A further implication for the financing of decarbonization comes from the central Keynesian insight that interest is the price of liquidity, not of saving. This means that proposals to help “mobilize private savings” to finance the climate transition are

²⁵ Steven A Sharpe and Gustavo A Suarez. “Why isn’t business investment more sensitive to interest rates? evidence from surveys.” *Management Science*, 67:2 (2021), 720–741.

²⁶ Braun, Benjamin. “Central Bank Planning for Public Purpose.” In *Pandemic Exposures: Economy and Society in the Time of Coronavirus*. HAU Books, 2021. 105-121.

fundamentally misguided; this is not a problem that has to be solved. An understanding of the financial system as a provider of liquidity rather than of real resources helps clarify the appropriate division of labor between the public and private sector. It is certainly true that financing can be an obstacle to private investment in decarbonization, especially in newer and more capital-intensive sectors.²⁷ But it is sometimes suggested that national governments or publicly-sponsored investment authorities also face a problem of acquiring private financing, and should issue special green bonds or equity-like instruments to help “mobilize private capital” for decarbonization.²⁸

Such proposals confuse the meaning of “capital” as concrete means of production with “capital” as a quantity of money. Mobilizing the first is a genuine challenge for which private businesses do offer critical resources and expertise not present in the public sector; but mobilizing these means paying for them, not raising money from them. On the financing side, on the other hand, the private sector offers nothing; in rich countries, at least, the public sector already borrows on more favorable terms than any private entity, and has a much greater capacity to bear risk. The problem of mobilizing private finance for public needs has already been fully solved, at least in the rich countries, by central bank-supported sovereign debt. If public-sector borrowing costs are higher than desired, this can be directly addressed by the central bank; offering new assets for the private sector to hold does nothing to help with any public sector financing problem, especially given that such proposals invariably envision assets with higher yields than existing public debt.

A variation on this is proposals that the public sector should support private finance by “de-risking” private climate investment. Such proposals raise their own concerns.²⁹ But they do at least recognize that the risk-bearing capacity of the state exceeds that of private actors. A sovereign government with a central bank is the only entity in the

²⁷ Max Jernecke. “Financialization impedes climate change mitigation: Evidence from the early american solar industry.” 2017.

²⁸ For example, see Robert C Hockett and Saule T Omarova, “Private wealth and public goods: A case for a national investment authority.” *Journal of Corporate Law*, 43: 437, 2017.

²⁹ For a thorough critique of the “de-risking” approach to climate finance, see Daniela Gabor, “The Wall Street Consensus.” *Development and Change*, 2021.

economy that cannot face liquidity constraints. Public finance for private projects may make sense; private finance for public projects does not.

Concluding thoughts

The differences between the older climate economics, with its emphasis on tradeoffs and price mechanisms, and the investment-centered approach, do not only reflect different views about what kinds of climate policies will be effective and achievable. They also reflect different, though not always articulated, visions of how the economy operates. It is rather than real resources.

I have argued so far that some widely-accepted economic constraints on climate policy are in fact not very important. I will conclude by suggesting two economic challenges for climate change that are in my opinion underemphasized.

First, if we face a political conflict involving climate and growth, it is not because decarbonization requires accepting a lower level of growth, but because it entails *faster* economic growth than existing institutions can handle. The great Polish economist Michal Kalecki long ago pointed out that unemployment plays a central role in maintaining hierarchies in the workplace: “Under a regime of permanent full employment, the 'sack' would cease to play its role as a disciplinary measure. The social position of the boss would be undermined ... It is true that profits would be higher under a regime of full employment But 'discipline in the factories' and 'political stability' are more appreciated than profits by business leaders.”³⁰ Sustained strong demand and rapid growth may be limited not by any technical constraints on production, but by the distributional conflicts that arise as low unemployment allows workers to demand a greater share of income and increased rights in the workplace.

³⁰ Michal Kalecki, “Political Aspects of Full Employment.” In *Collected Works of Michal Kalecki: Volume I. Capitalism: Business cycles and full employment*. Vol. 1. Oxford University Press, 1990.

This idea – with roots in Marx’s “reserve army of labor” – has been domesticated in the textbook idea of a “natural” rate of inflation – one that avoid distributional conflict by limiting wage growth.³¹ The assumption that faster growth is possible only if workers remain docile is shared by many mainstream policy makers. Federal Reserve chair Alan Greenspan observed in the 1990s that low unemployment was sustainable only because workers had been “traumatized” by the deep recession and attacks on trade unions in the previous decade.³² More recently, the European Central Bank has demanded measures to weaken labor rights as a condition of accepting pro-growth fiscal measures in a number of European countries.³³ Today, business leaders on both sides of the Atlantic increasingly complain of “labor shortages.”

In principle, centralized bargaining could give workers a stronger voice in the workplace and a gradually rising share of national income, without undermining the conditions for private investment. But under the neoliberal macroeconomic model, wage bargaining is decentralized, and limiting economic growth is the main tool for managing distributional conflicts. If decarbonization leads to stronger demand and more rapid growth, this will empower workers to demand higher wages and more control over the workplace. In the absence of new institutions for collective bargaining, these demands will be a source of ongoing frictions and social conflict. The great political challenge of the climate transition may turn out to be not that ordinary people have to accept getting less, but that business owners have to accept ordinary people getting more.

Second, rapid decarbonization will require considerably more centralized coordination than is usual in today’s advanced economies. If there is a fundamental conflict between

³¹ For a discussion of the links between these concepts, see Robert Pollin, “The ‘reserve army of labor’ and the ‘natural rate of unemployment’: Can Marx, Kalecki, Friedman, and Wall Street all be wrong?.” *Review of Radical Political Economics* 30.3 (1998): 1-13.

³² Mitchell, Daniel JB, and Christopher L. Erickson. “Not yet dead at the Fed: Unions, worker bargaining, and economy-wide wage determination.” *Industrial Relations: A Journal of Economy and Society* 44.4 (2005): 565-606.

³³ See www.corriere.it/economia/11_settembre_29/trichet_draghi_inglese_304a5f1e-ea59-11e0-ae06-4da866778017.shtml. I discussed the ECB’s interventions in support of liberalization at the time on my blog, for example at <https://jwmason.org/slackwire/pain-is-agenda-method-in-ecbs-madness/>.

capitalism and sustainability, I would suggest, it is not because the pursuit of profit implies or requires an endless increase in material throughputs. Rather, it is because capitalism treats the collective processes of social production as the private property of individuals. Rapid redirection of production – whether during industrialization, or in wartime – has always required a degree of central planning. Decarbonization (and adaptation to the climate change already underway) will require collective decisions about many aspects of production and consumption that are today regarded as private choices. It will also turn many decisions that are already made collectively, but in ways that are regarded as natural or neutral, into visible political questions. To take one important example: A central bank setting an interest rate is already engaged in a form of planning, but this can be presented as a purely technical matter. If the climate transition requires central banks to channel credit toward specific sectors or businesses, the fiction of central bank “independence” will no longer be tenable and their actions will be subject to the same kind of scrutiny and contestation as those of other branches of government.

The planning required by the climate transition will run against decades of ideological opposition to central planning and to an expanded role for the public sector. (Although, on the other hand, it may gain some legitimacy from the extraordinary public response to the pandemic.) But beyond these ideological obstacles, it will also face the more straightforward problem that many of the required institutions don't currently exist, at least not on the scale required. The tools of economic planning used so extensively (and, arguably, successfully) by notionally “capitalist” countries like Japan and France in the postwar decades have long since been abandoned; rebuilding them is not an easy task. The investment-centered approach to decarbonization calls for some institution that can identify a coherent set of priorities for climate investment and that has the authority – and political legitimacy – to direct spending toward them. The lack of such an institution, and not any material scarcity, may be the most urgent and immediate challenge for the transition to a sustainable economy.