

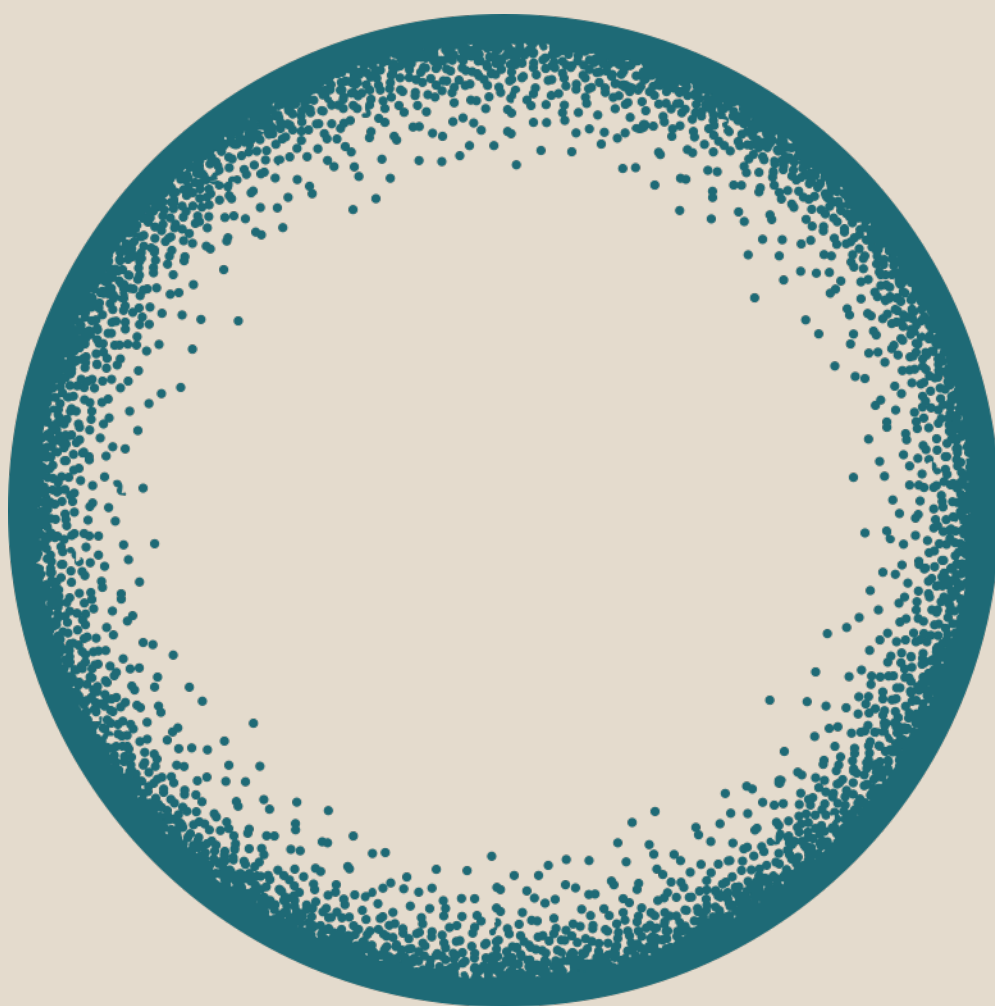
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NEW PERSPECTIVES ON MONETARY POLICY¹

Moritz Schularick*

Abstract

This paper presents and discusses new perspectives on the framework of monetary policy that challenge the current paradigm: (i) The development of heterogeneous agent models in which “divine coincidence” no longer holds and trade-offs between inflation and output stabilization arise; (ii) New theoretical and empirical evidence on the distributional effects of conventional and unconventional monetary policy; (iii) Evidence that stabilization policy by central banks invites more leverage, risk-taking and a rising exposure of intermediaries to the systematic risks that central banks insure, which in turn increases financial and economic fragility.

JEL codes: E42, E52, E58, E64, H63

Keywords: monetary policy, heterogeneous agent model, inequality, asset prices, Central Banks’ mandate, stabilization policy

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*University of Bonn and Sciences Po, Paris (schularick@uni-bonn.de). The views expressed herein are solely the responsibility of the author and all errors are my own. I am very grateful to my coauthors, especially Alina Bartscher, Oscar Jordà, Moritz Kuhn, Alan Taylor and Paul Wachtel for the joint research in the past years that this essay draws on. The views expressed herein are solely the responsibility of the authors and should not be interpreted as reflecting the views of the Federal Reserve Bank of New York, or the Board of Governors of the Federal Reserve System.

1. INTRODUCTION

In my undergraduate lecture in Bonn, there is general disbelief among the students when I tell them that economists do not really know or at least passionately disagree what the effects of an increase in government spending on output are, or how and through what channels monetary policy affects the economy. They find it hard to believe that after all these years, there is still no “clear” consensus on what exactly happens when the government spends more, or the central bank changes interest rates. I also tell them that this fundamental uncertainty does not prevent the periodic emergence of a consensus of “how” one should think about the question and what the effects are, often on the basis of some limited piece of new evidence or some new theoretical insight about what should be true conditional on certain assumptions. I try to explain to them that although such a consensus rests on a weak footing it can become powerful and entrenched. And that it can be used to create, legitimize and maintain institutions that embody the constellation of a specific historical moment and the interests and ideas that prevailed at the time.

I then introduce the ideas of Karl Popper, especially the concept of falsification. I suggest that it should at least be possible to falsify certain ideas with empirical tests and data – so we can then move on to new ones. There is typically wide agreement that this sounds like a sensible idea. But obviously I pour cold water on that idea too, because it is very hard to agree on what falsification means, even in the hard sciences. I use the example of the discovery of a planet that does not seem to obey to Newtonian gravitation laws. Would we jump to the conclusion that Newton was wrong? Surely not. We would come up with all kinds of ideas why this observation does not disprove an entire system of thought. Something must be wrong with the data. Or we need better observation tools, a better telescope and that takes time to build. Even when we have better equipment and still observe the gravity defying phenomenon, we would hesitate. Maybe something else is interfering with the planet that we simply cannot observe? We might well conclude that this is just an anomaly, a “puzzle”, but that our cherished theory holds after all.

How do big concepts, paradigms ever change then? In Thomas Kuhn’s famous analysis of paradigm shifts they happen only when “significant anomalies” have accrued against a current paradigm. Yet what “significant” means, remains open here too. And that’s only the necessary condition. The sufficient condition is – to paraphrase Max Planck – that enough funerals have taken place and a new generation of researchers can move on to a new paradigm.

I start the essay with this anecdote, because I have been asked to think “out of the box” about evolving central bank mandates and the future of monetary policy. These questions are closely linked to larger paradigms in economics, and this essay is an attempt to look at recent developments in the field, revisit some historical evidence, and speculate about future directions for central banks and

their mandates. It's not meant to be comprehensive. For instance, I will not talk about the important debate on the role of monetary policy in supporting the fight against and adaptation to climate change. I am also not touching the debate about fiscal dominance stemming from large central bank holdings of government debt in post-crisis and post-Covid eras. Finally, I will not talk about central bank digital currencies and their promise.

Instead, I will focus on the more traditional subject of output and inflation stabilization – the bread and butter of central bank activities. I will not make predictions about the future, but it seems almost certain to me that 20 years from now central banking will look very different from what it is now. This is because a number of fundamental challenges have emerged that question the reigning post-1980 model of independent central banks with a comprehensive stabilization mandate. I speculate that these criticisms will grow stronger over time.

I will begin with a short history of macroeconomic stabilization policy to place the current moment into perspective. It serves to illustrate how central banks mandates have been changing and that there is little reason to think that we have reached the end of this historical process. I will then focus on three aspects that have emerged in recent research. I will discuss the end of “divine coincidence” and the distributional effects of monetary policy. I will also talk about the interactions of central banks and the financial sector in a fiat money world when central banks can never credibly promise not to bail out a financial sector in distress.

2. A SHORT HISTORY OF STABILIZATION POLICY

The Great Depression was the watershed event for macroeconomic thinking in the 20th century. Yet the lessons that contemporaries drew from this crisis differed in important ways from the conclusions that were drawn from the 2008 global financial crisis. The key lessons from the Great Depression were that (i) the macro-economy is inherently unstable and that this instability could cause economic and political disasters; (ii) that fiscal policy was the best stabilization tool; (iii) that the financial sector is inherently fragile and that its pro-cyclical and manic-depressive tendencies must be tamed by tight regulatory oversight.

This list delivered the blueprint for postwar economic policy. Monetary policy did not feature prominently on the list. For the first three postwar decades, central bankers were little known bureaucrats, not the media superstars they are today. The real game was elsewhere, in democratic politics. The macroeconomic bedrock of that era was fiscal policy. The idea was that fiscal policy could be used to steer the economy through the business cycle. In good times, when the economy was running too hot, taxes would be raised or spending cut to cool off the economy. In bad times, taxes would be

cut and public spending increased to stimulate aggregate demand. The conviction that many economists held at the time was that this was by far the superior way of stabilizing the economy. It was direct and immediately felt in the pockets of households.

Monetary policy, by contrast, was said to have long and variable lags, making fine tuning difficult. Moreover, it depended on uncertain transmission channels and decisions of agents that were not under direct control of the central bank. What exactly would the elasticity of private investment to interest changes be? Nobody could know for sure. As a result, the dominant thinking was that central banks would play no more than a supporting act: keeping interest rates low enough for the government to borrow at cheap rates. Moreover, in a world of fixed exchange rates, their role was limited. The gold standard was kept in place as a hybrid system. The US dollar remained in theory convertible into gold, other international currencies were bound to the dollar, and hence indirectly to gold. As for the banking sector – it had a tarnished reputation after the havoc that the mass failure of banks brought about in the Great Depression. Banks were put on a tight leash. The Depression era rules for finance were draconian by today's standard. Banks were national, tightly regulated, repressed and boring.

By some standards, the system worked well. It allowed the postwar growth spur to run for close to three decades. The framework ran into troubles in the 1960s, in the U.S. more than elsewhere, when it became clear that the political process was too cumbersome for fiscal policy to work as a reliable stabilization tool in the short-run. It also had a major flaw: Governments did rarely ever find it politically desirable to raise taxes or reduce expenditures in the boom. Deficits became the norm irrespective of the economic cycle. A tendency for governments to overstimulate led to entrenched inflation. Although inflation remained under control in most countries, it often ran at higher rates than today while remaining in the single digits.

With rising deficits, the opposition to big government managing the economy gained strength in the late 1960s. The intellectual godfathers of the neoliberal movement were Friedrich von Hayek and Milton Friedman, both eventual Nobel laureates. The Economist would later call Friedman “the most influential economist of the second half of the 20th century.” Friedman's 1969 presidential address to the American Economic Association is one of the most famous and most influential speeches in the history of economics. It foreshadowed the U-turn that economic policy would make in the coming decade. Friedman-style monetarism broke ranks with the postwar Keynesian orthodoxy in a number of ways.

First, he turned the table by claiming that the macro-economy was inherently stable and that it was government intervention that made it unstable. Informed by his analysis of the Great Depression, Friedman placed special emphasis on the disruptions and instability that came from fluctuations

in monetary aggregates caused by monetary policy mistakes. In this view of the world, business cycles were first and foremost the result of monetary fluctuations. Stable growth of monetary aggregates would eliminate much volatility. Second, Friedman famously argued that attempts to push unemployment below its natural level, would be doomed sooner or later and lead to higher inflation, but not more growth. The focus of policy-making should be on the long-run supply side of the economy, not on managing short-term fluctuations. Third, in Friedman's view monetary policy had an advantage over fiscal policy, because it was unburdened by politics and neutral from a distributional point of view. Above all, monetary policy could avoid turning into a problem itself. In his own words:

“The first and most important lesson that history teaches about what monetary policy can do is that monetary policy can prevent money itself from being a major source of economic disturbance. This sounds like a negative proposition: avoid major mistakes.”
(Friedman, 1969)

Friedman and most of his other fellow first generation monetarists were no fans of active stabilization policy. They argued for a hands-off approach when it came to “normal” business cycles fluctuations. Stabilizing monetary aggregates was all that could be done:

“We simply do not know enough to be able to recognize minor disturbances when they occur or . . . what monetary policy is required to offset their effects. . . In this area particularly the best is likely to be the enemy of the good. . . [We should] use monetary policy explicitly to offset other disturbances only when they offer a clear and present danger.”
(Friedman, 1969)

At roughly the same time a new breed of macro-economists around Robert Lucas, Thomas Sargent and others developed models in which monetary policy did not matter at all. In so-called RBC (real business cycle) models, the economy is uber-stabil, prices are completely flexible, markets complete and money neutral. Money and finance do not matter. In such an economy, stabilization policy is unnecessary. Because prices are flexible and everyone has rational expectations, policy makers can no longer exploit the Philips curve trade-off. Expectations will adjust and front-run the policy maker. Not surprisingly, in a model world without frictions, filled with agents who live forever and never make mistakes, the role for policy was limited. If anything, policy makers should focus on the long-run supply side of the economy to increase production potential.

The new Keynesian model that became the dominant paradigm in monetary economics in the past three decades was a compromise. It is an effort to combine the real business cycle theory with ideas of Keynesian economics. It builds on the RBC models developed in the 1970s and 1980s, but it contained some real world imperfections that prevented the economy from always staying at the

flexible price optimum. First, there is no perfect competition in the goods market, allowing for positive price markups. Second, the model introduces nominal rigidities in the price adjustment. Under such assumptions, money is not neutral. Nominal price rigidities and limits to competition mean central banks have a job to do. They can move interest rates to stabilize the economy and keep it as close as possible to the state it would be in without such “imperfections”. Fiscal policy is not important in such a world, even unnecessary, as monetary policy can perfectly stabilize the economy.

3. THE END OF “DIVINE COINCIDENCE”

New Keynesian models with representative agents have an attractive feature that made them palatable to the older monetarist guard and helped to convince the public that delegating inflation control to an independent central bank was the right thing to do. The reason is that in such models stabilizing inflation also stabilizes output and employment. There is no trade-off between the two. This has become known as the “divine coincidence”. Keeping inflation close to target is all that is necessary to support the economy through the cycle, irrespective of the source of the shock. Welfare losses will be zero and the economy attains its first-best allocation. There is no need for a government agency with the explicit mission of making sure that there were enough jobs. In the words of Olivier Blanchard and his coauthors (Blanchard et al. 2010):

“In the benchmark version of that model, constant inflation is indeed the optimal policy, delivering a zero output gap (defined as the distance from the level of output that would prevail in the absence of nominal rigidities), which turns out to be the best possible outcome for activity given the imperfections present in the economy (Blanchard and Gali 2007). This divine coincidence (as it has been called) implied that even if policymakers cared very much about activity, the best they could do was to maintain stable inflation. This applied whether the economy was affected by “animal spirits” or other shocks to consumer preferences, technology shocks, or even changes in the price of oil.”

A few things are noteworthy with respect to this New Keynesian synthesis. First, it marks a clearer departure than is often acknowledged from the older monetarist tradition. Monetarism focused on an input variable (money) while the new framework focused on an output variable (inflation), based on ideas about the transmission mechanism of monetary policy. Second, the model moved beyond the original intentions of Friedman and his fellow monetarists to simply stabilize money growth and thereby prevent monetary fluctuations from disturbing the economy. In the New Keynesian framework, the central bank had an encompassing stabilization mandate. It had to cushion all kinds of “shocks” hitting the economy to remain on track and meet the inflation target.

To give an example: the response to a negative shock in the old monetarist model would be to make sure that monetary aggregates continued to grow at the same pace as before, say at a rate of

5%. Otherwise, policy makers would let the economy adjust. In the New Keynesian model, the job of the central bank was to do everything to keep inflation stable, even if this meant temporarily accelerating money growth to a much higher rate until it could be sure that inflation would come back to target.

There were many missing parts in the New Keynesian model. For instance, it is well understood now that financial frictions can play a central role and banks and intermediaries cannot simply be assumed away from the economy. But a more fundamental challenge arrived in the form of a new model class that is rapidly becoming the new leading paradigm. So-called heterogeneous agent models put an end to the assumption that all agents in the economy are the same. That's because they are not. Some are rich, some are poor. Some own a house, others do not. Some have access to credit, others do not. Some are old, some are young. Some spend a high share of their income, some do not. Heterogeneous agent models give a more realistic picture of the economy, including incomplete markets with imperfect insurance, hand-to-mouth households, different portfolios and borrowing constraints.

Broadly speaking, these differences mean that households will be affected differently by monetary policy. In models with heterogeneous agents, monetary policy can have differential impacts on specific groups as transmission no longer exclusively takes place through intertemporal substitution. For instance, pronounced differences in asset holdings (portfolio heterogeneity) are an important channel for such effects (Kaplan, Moll, and Violante, 2018). Depending on where one looks in the income, age, debt, or wealth distributions, the effects of changes in interest rates, borrowing conditions, asset prices, consumption response and so on, will be different.

This has an important consequence: "Divine coincidence" no longer holds. Stabilizing inflation does no longer stabilize employment and the economy. The presence of incomplete markets and differences in marginal propensities to consume, in addition to nominal rigidities, break the concept in heterogeneous agent models (Kaplan, Moll, and Violante, 2018). In other words, trade-offs can emerge that can turn into a headache for central banks such as the ECB who do not have a dual mandate. It means that keeping inflation at some level can result in lower employment and overall welfare. Whether the welfare losses that can arise from higher unemployment by keeping inflation low, are worth the inflation control, is a question for the principal, the people, and their elected representatives. It's not a decision for un-elected central bankers.

Another implication of heterogeneous agent models is that monetary policy now has potentially severe distributional implications, which raises a series of unpleasant trade-offs that also did not form part of the original mandate that was given to central banks. This is what I turn to next.

4. MONETARY POLICY AND INEQUALITY

The traditional New Keynesian framework for monetary policy was basically “distribution-blind.” In the model, there was only one representative household. The assumption was that changes in interest rates, other than fiscal policy decisions on spending and taxation, would not make some parts of the population better or worse off than others. It was the same interest rate for everyone, the effects would proportionally fall on all households that make intertemporal choices. But in recent years, a rapidly expanding literature has questioned this assumption both theoretically and empirically. As discussed above, the development of heterogeneous agent models in which monetary policy can have distributional effects has sparked new interest in the size and transmission mechanisms of monetary policy. Old truths no longer hold.

Although distributional questions remain outside central banks’ formal mandates, central bankers are increasingly discussing distributional issues. For instance Mary Daly, President of the Federal Reserve Bank of San Francisco, addressed the question: “How can we build a society that delivers on the promise of equal opportunity and inclusive success?” Her answer in part was that “the Fed has a critical role to play”².

Recent central bank policy itself has played a role in triggering debates about distribution. Most prominently, balance sheet policies at the zero lower bound work through changes in the price of financial assets (Bernanke, 2020). A substantial body of empirical work (summarized recently in Paul, 2020) points to the substantial and long-lasting effects of central bank policies on asset prices, typically through a risk premium channel. But the distribution of financial assets is highly unequal and portfolio differ across the wealth distribution: rich households own mostly equities and houses that are more strongly affected by changes in risk premia, whereas poor households have little wealth by definition and hold most of it in savings accounts.

In light of this different exposure of household portfolios to interest rate changes, accommodative monetary policy that pushes up the price of risky assets tends to widen wealth inequality, at least temporarily. Monetary policy that affects asset prices in an environment of large pre-existing differences in portfolio structure and wealth will therefore not be distributionally neutral.

Central banks have responded to that criticism by pointing out that the effects of such policies on the income distribution tend to go in the other direction: By creating more jobs and employment, looser monetary policy helps people at the bottom of the income distribution who depend more on labor income (Draghi, 2016). In their paper on the distributional effects of monetary policy in the U.S., Coibion et al. (2017) refer to this effect on low-income workers as the earnings channel that

² <https://www.frbsf.org/economic-research/publications/economic-letter/2020/october/is-federal-reserve-contributing-to-economic-inequality-speech/>

helps poor households. They find that contractionary monetary policy increases income inequality and that consumption rises more for wealthy households than for poor (and often minority) households. There is certainly some truth to this, although recent studies point a more nuanced picture with arguably better data, for instance from Sweden (Amberg et al., 2021).

A few papers have examined the effect of monetary policy on wealth inequality. Adam and Tzamourani (2016) use Euro-area data from the Household Finance and Consumption Survey to estimate the impact of asset price changes on the wealth distribution.³ They conclude that the most important effects work through housing and equity prices. That is, the effect of monetary policy on the wealth distribution is due to asset price changes and portfolio composition differences among households. As a consequence, they conclude that unconventional monetary policy has important distributional consequences primarily due to its impact on the wealth of the very rich. Holm, Paul, and Tischbirek (2020) find evidence that contractionary monetary policy shocks increase income inequality, but decreases wealth inequality. Andersen et al. (2021) use Danish microdata to study the effects of monetary policy on income, consumption and wealth inequality. They find that households benefit from expansionary monetary policy at all income levels in terms of disposable income, net wealth and durable consumption, but that rich households benefit much more than poor ones.

As a first approximation, it seems that the regressive effects of monetary policy easing on the wealth distribution have to be balanced against the effects on employment and income. This means that policy trade-offs emerge that did not exist before: on the one hand, more accommodative monetary policy may benefit poor households by reducing unemployment and increasing labor market participation and earnings, thereby helping to reduce the income gap. Yet on the other hand, the same policies may widen wealth differences as rich households tend to benefit more from rising asset prices than poor households because of their portfolio composition and greater financial wealth. In recent work, Bartscher et al. (2021) study both effects for the U.S. and come to the conclusion that over long-time horizons the wealth gains for rich households are far larger than the income gains for poor households.

Recent theoretical work has also started to take the asset price channel of monetary policy transmission seriously (Auclert, 2019; Auclert, Rognlie, and Straub, 2020). How do capital gains resulting from monetary policy changes affect economy? First, changing asset prices can affect household consumption through a standard wealth effect. Because people get richer, they increase

³ They show that the European Central Bank's Outright Monetary Transactions had large effects on asset prices. Similarly, large effects of quantitative easing on equity prices are shown in Haldane et al. (2016). Domanski, Scatigna, and Zabai (2016) use survey data from six countries and some stylized assumptions on returns to explain changes in the wealth distribution during the financial crisis. Glover et al. (2020) also emphasize portfolio differences as an important source of redistribution after asset price changes when exploring business-cycle-induced changes in asset prices during the Great Recession.

their consumption. In a recent paper, Berger et al. (2018) demonstrate that a heterogeneous agent model is quantitatively consistent with large-estimated asset price effects on consumption. Second, asset price changes lead to redistribution between prospective buyers and sellers of assets, as emphasized in Moll (2020). This is because households planning to buy the asset that appreciates in value experience welfare losses, whereas households who plan to sell gain from it. Life-cycle savings motives in the tradition of Modigliani and Brumberg (1954) readily create short and long positions in assets between young and old households. Glover et al. (2020) explore such redistribution with a focus on the life cycle with a focus on the consequences of the large asset price changes during the financial crisis.

Yet so far, the effects of monetary policy on the wealth distribution have not attracted much attention for two reasons. First, the asset price effects of monetary policy were often considered short-lived. However, the recent literature has pointed to more persistent effects of monetary policy on asset prices. Market participants have few doubts that monetary policy moves markets, or that it validates risk-taking and run-ups in asset prices ex-post – the so-called “Fed put” (Authers, 2020; Cieslak and Vissing-Jorgensen, 2020). There is a growing consensus now that monetary policy moves asset prices over extended periods. Rigobon and Sack (2004) and Bernanke and Kuttner (2005) pioneered empirical approaches. Both studies found substantial effects of policy surprises on stock prices that mainly come from changes in risk premia (excess returns). In both studies, a surprise 100bp shock lowers stock prices by between 5% and 7%. Jordà, Schularick, and Taylor (2015) document substantial effects of exogenous changes in monetary conditions on all major asset classes over multi-year horizons in a long-run cross-country data set. A recent paper by Paul (2020) argues that monetary policy today has larger and more persistent effects on asset prices than in the past.

Even over shorter horizons, temporary changes in asset prices can have permanent effects if households buy assets at depressed prices (Glover et al., 2020) or if capital gains are used to upgrade houses, move to better neighborhoods, or finance education expenditures (Bernanke, 2020). At the same time, the rise of non-conventional monetary policy that operates through changing the prices of assets in financial markets has also intensified interest in the nexus between monetary policy, risk premia, and asset prices (Bernanke, 2020; Wu and Xia, 2016). In sum, recent evidence suggests that the effects on asset prices are measurable and persistent over a horizon of many years. Table 1 shows the estimated effects of a 100bp monetary policy shocks following Pascal Paul’s (2020) recent paper. A 100 bp policy shock raises stock prices by about 10-12%, and house prices by 2%. The effects persist over a 5-year horizon.

The second reason why the effects of monetary policy on the wealth distribution have only recently come into focus is that systematic differences in households have only recently become a concern for

macro-economists. Monetary policy affects household balance sheets if and when household portfolios differ systematically between poor and rich households (Brunnermeier and Sannikov, 2013; Kaplan, Moll, and Violante, 2018). For instance, Kuhn, Schularick, and Steins (2020) show that household portfolio composition differs with socioeconomic characteristics. In particular, in the U.S. the holdings of risky asset such as stocks and corporate bonds are highly concentrated among white households at the top of the wealth distribution.

Table 1: *Time-varying VAR responses following Paul (2020), 100 bp expansionary shock*

Shocks	Horizon	House Prices (%)	Stock Prices (%)
Paul (2020)	1y	1.4	13.85
		(-3.1, 5.82)	(-0.99, 29.48)
	2y	1.98	12.41
		(-5.34, 9.54)	(-4.2, 30.69)
	3y	2.19	11.29
		(-6.51, 12.1)	(-6.49, 30.95)
	4y	2.14	10.64
		(-8.03, 14.24)	(-8.69, 31.45)
	5y	1.95	10.12
		(-9.02, 16.24)	(-9.84, 32.93)

Notes: Approximate 90% Confidence Intervals in parentheses. Estimation includes monthly effective Federal Funds Rate and the unemployment rate in addition to variables shown. TVVAR method uses Gibb's sampling to uncover the distribution of responses over different time periods. Source: Bartscher et al. (2021).

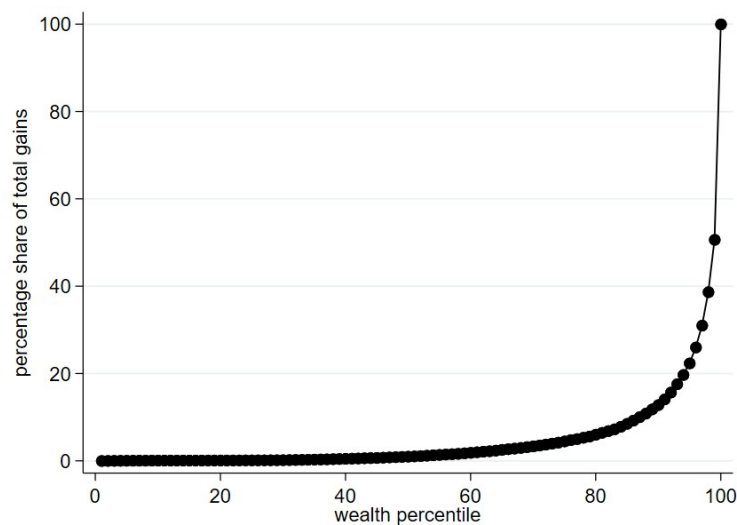
Using Norwegian data, Fagereng et al. (2021) show that capital gains have a greater impact on the wealth distribution than differences in the saving rate between rich and poor households. Almost everywhere income-poor households hold substantially different portfolios and in particular less financial assets than rich households so that monetary policy potentially has larger effects on rich households' portfolios. The median poor household has no stock holdings, nor owns a house. Thus, any effect that monetary policy has on the price of such assets bypasses the majority of poor households. Figure 1 confirms this by showing the portfolio effects of asset price gains following a 100bp easing shock in the U.S.

A mentioned above, Bartscher et al. (2021) study the impact of monetary policy on racial groups in the U.S. They find that, on average, a 100-basis-point accommodative monetary policy shock leads to capital gains for white households from asset price changes of at least \$25,000 which is about one-quarter of their average income (and about 40 percent of median income). By contrast,

the wealth gain that black households experience is substantially smaller, about \$5,000, corresponding to 9 percent of their average annual income. Looser monetary policy therefore aggravates racial wealth disparities.

Moreover, they compare the earnings and wealth effects directly and present evidence that the effects of accommodative monetary policy on the wealth of rich households are potentially large, while the effects on employment are small. As a result, accommodative monetary policy shocks widen wealth inequality in their framework but lower income inequality (to some extent).

Figure 1: *Lorenz curve of portfolio gains following a 100bp monetary policy shock*



Notes: The graph shows the Lorenz curve of the total portfolio effect along the wealth distribution five years after a monetary policy shock. Source: Bartscher et al. (2021).

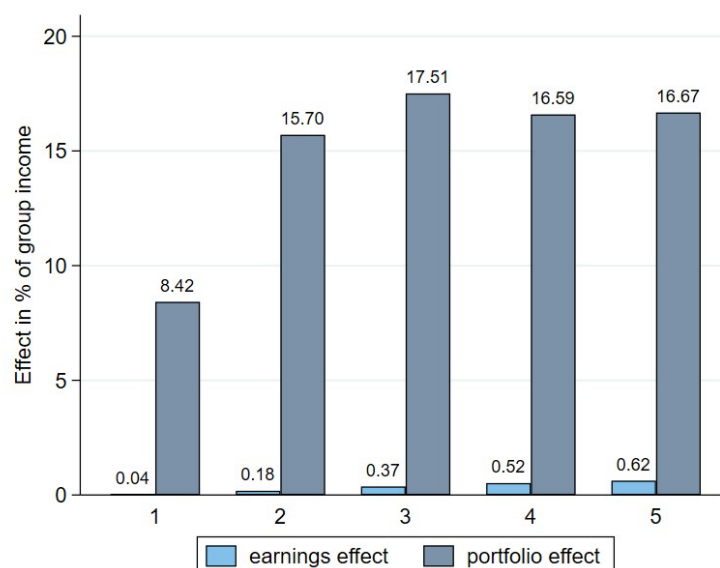
This result that monetary policy shocks widen wealth inequality meshes with the idea that lower interest can beget higher wealth inequality (Greenwald et al., 2021).

For instance, the magnitudes of the effects on wealth and income can be compared by considering the impact of capital gains on consumption. Combining the Bartscher et al. (2021) estimate that a 100bp monetary easing translates into an average capital gain of roughly \$25,000 for white households with a conservative estimate of the marginal propensity to consume out of wealth of 3% yields additional consumption expenditures of \$750 – almost eight times the size of the yearly earnings effect that they estimate for black households. Put differently, under plausible assumptions, the wealth effect on consumption for white households alone is larger than the earnings effects for black households.

However, there is an important conceptual difference between the two effects. The earnings effect applies to the flow of earnings while the capital gains are a gain on the stock of wealth. Thus, the capital gain is a one-time change in the valuation of assets while the earnings effect applies to incomes also in subsequent years. To take this difference into account, we compare the difference in

capital gains between white and black households over the five-year horizon to the accumulated estimate of the (differential) earnings effect over this time period. Figure 2 shows the year-by-year accumulated earnings effects and the difference in the portfolio effects on black and white households from a monetary policy shock. Capital gains are larger for white households and earnings gains are larger for black households. Yet even as the earnings effect accumulates over time, it remains orders of magnitude smaller than the effects from capital gains.

Figure 2: *Comparison of earnings and portfolio effects from policy shocks for black and white households*



Notes: Source: The graph compares the cumulative earnings effect to the portfolio effect based on Romer-Romer shocks. Bartscher et al. (2021).

5. CENTRAL BANKS AND THE FINANCIAL SECTOR

In this last part of the paper, I want to talk about challenges that have to do with the interaction of central banks and financial markets in a fiat currency world. By historical standards, our current fiat money standard is a rather recent experiment. It is barely 50 years old. It dates back to a televised speech on August 15, 1971. President Nixon blamed foreign speculators for an attack on the dollar and then let the cat out of the bag: “I have instructed Secretary Connolly to suspend temporarily the convertibility of the dollar into gold.” When Nixon ended the convertibility of the dollar into gold, the world’s money supply was no longer exchangeable into a scarce commodity with intrinsic value. Forms of fiat or paper money have existed before in history, from China to the North American colonies. But these were short-run deviations from commodity monies. Outside wars and major emergencies, commodity-linked money had been the normal state of monetary affairs for millennia.

By and large, central banks have been successful keeping inflation low in the paper money world. The rate of price increase has generally been low and not far from levels that are in line with the cherished concept of price stability. In Europe and the U.S., average inflation since 1980 has been

below 3% per year. However, when it comes to stabilizing the economy, the record of 40 years of the fiat money standard is much more mixed. This is because the last decades have been marked by costly economic crises, a return of financial instability and war-like expansions of central bank balance sheets. This observation brings us to a deeper paradox of central bank stabilization policy that is rarely discussed.

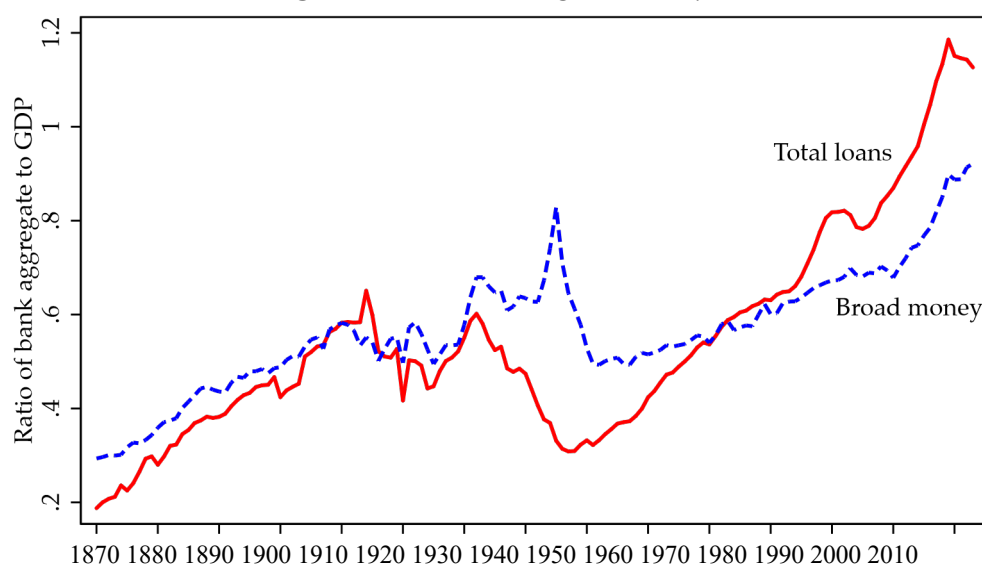
With central banks freed from golden fetters to move interest rates and the money supply to stabilize the economy and to support ailing financial institutions, the world should have become safer. But has it? By the 1990s, most advanced economies had independent central banks that were liberated from previous constraints to fine-tune and manage the economy. And to some extent the world has become a safer place. Both output and consumption have become less volatile under the fiat money standard.

But there is a catch. While short-run business cycle fluctuations have become less pronounced, big disasters have not. On the contrary, the frequency of severe recessions, often coinciding with financial crises, has increased again. Rare but extraordinarily severe recessions and crashes have not become less likely under the fiat money regime and are no less harmful today than at the height of the gold standard. In technical terms, business cycles have become more skewed. Most of the time, cyclical fluctuations are mild, but we live in a world of pronounced left tail events. In the last 20 years every second recession was associated with a major financial crisis. Before the fiat money era, only every fourth recession went hand in hand with a financial crisis.

This opens up a larger set of questions. Let's start with the idea that central bank stabilization policy reduces aggregate risks in the economy. Recessions will be shallower, unemployment fluctuations smaller, corporate cash-flows more stable than in, say, a gold standard world without central bank smoothing. Agents will observe and understand that whenever an aggregate shock hits the economy, there is a central bank that will do whatever it can to cushion the impact. Forward-looking agents will react to this new safety cushion and take on more risk. A stable macroeconomic environment invites risk taking and higher leverage. But more debt and more risk make the economy more fragile over time. They can lead to financial stability down the road. The idea that stability breeds instability goes back to Hyman Minsky. But it is very much alive in current thinking in the form of the "volatility paradox", "occasionally binding leverage constraints" as well as in research in behavioral finance that links financial risk-taking to periods of the presumed safety and stability of economic conditions. In essence, a rational investor will respond to the central bank aggregate risk insurance by taking on more leverage, because she understands that the world is safer for more debt.

Yet over time more leverage makes the system more fragile. So when the next shock comes, central banks have to run ever faster just to stand still. The more leveraged the economy is, the harder it becomes to withstand repeated shocks, to stabilize the economy and get out of the slumps. The experience of the past 40+ years experiment with fiat money can be interpreted in this light. We have witnessed a massive increase in leverage that has created a more fragile system that has become more and more dependent on central bank backstops.

Figure 3: *A more leveraged economy*



Notes: The graph shows total bank lending over GDP for 18 countries. Source: Jorda, Schularick, and Taylor (2015).

The Covid-shock in March 2020 provides a telling example. It played out to a now well- established script. Global debt stood at record highs when the pandemic arrived. In advanced economies, households' and companies' debt was roughly equal in value to three years of economic output. Companies around the world had used a decade of low interest rates after the 2008 crisis to leverage up and boost their returns on equity. In the pandemic, these debts turned into a massive risk, threatening not only the survival of businesses but also the integrity of the financial system. Concerns over how many of these debts would be repaid, which companies would be able to withstand this new crisis, and how big the damage would be for lenders, especially banks, quickly came into focus. Within a week in March 2020, equity markets lost one third of their value, the prices of corporate bonds fell dramatically, bank share prices collapsed, and even the market for US government debt—usually one of the most liquid financial markets in the world—froze. The policy response followed a well-known playbook. It was the same used during the Great Recession. Central banks rushed to contain the financial fallout with emergency lending, asset purchases, and liquidity injections to "stabilize the price of risk". Central banks' balance sheets provided the backstop for the financial system and were expanded at unprecedented speed.

Not only have the abilities of central banks to insure the economy against shocks invited risk-taking. A commitment to "clean-up" after a crisis and support the price of risk can also be a source of excessive risk taking. In a fiat money world, a central bank can never credibly commit not to bail out the financial system. This means that the incentive for intermediaries to take correlated macroeconomic risks that cannot be diversified but only insured by the central bank have increased. We see this in the data. Intermediaries have loaded up on macro risks such as housing and interest rates – and earn returns on them – that are at least partly underwritten by the central bank. The balance sheet health of financial intermediaries today is to a large extent a function of asset prices in the economy, especially housing. Those are de facto underwritten by central banks as the integrity of the financial system depends on them. We live in an age of latent financial fragility, kept together by government backstops that have come to play a crucial role in stabilizing an inherently fragile credit system. We have gotten used to, paraphrasing the words of Hyman Minsky, stabilizing an ever more unstable economy.

When financial liberalization started in the late 1970s and early 1980s, on both sides of the Atlantic, this outcome was not what had been envisaged. On the contrary, freeing up and deregulating the financial sector came with the promise of more opportunity, higher growth, and better risk-sharing through more complete markets. The promise was that a liberalized financial system would bring more diversification, risk-sharing – and growth: a larger financial sector would make the world not only richer, because of higher growth, but safer too, because of diversification. With more complete markets, there are more possibilities to insure against all eventualities and shocks. The prevailing school of thought said that bigger was better and safer—and it looks like they were wrong. Instead, we have seen growing financial fragility as the past 40 years have witnessed a dramatic rise in the frequency of financial crises and correlated risk-taking, with increasing economic and political damage. The invisible hand of the market has needed an outsized helping hand to assist it. Nobel-prize winning economist James Tobin once called debt "the Achilles heel of capitalism." Written in the 1980s, it was a prescient statement.

6. CONCLUSION

I started this essay with the observation that important parts of the macroeconomic paradigm have shifted over time, and so have central bank mandates. The consensus on what the role of central banks is and how they should interact with the real economy is not set in stone, but reflects the shift in academic thinking and political priorities. In light of this observation on the historicity of central bank mandates, I put forward the hypothesis that over the next decade or two another shift in central bank mandates appears likely. This is because central assumptions on which the current framework is built have been challenged and slowly eroded by new economic thinking.

In particular, this essay discusses three challenges to the “stabilization and inflation control” mandate that I consider of special importance. But there are at least three other challenges that could become equally important: the role of central banks in assisting the ecological transformation and adaptation to climate change; the rise of digital currencies; and the complex relationship between fiscal and monetary policy in a world with low interest rates and high debt. The three challenges I focused on have their origin in recent research in macroeconomics and macro-finance. The first and the second are the by-product of integrating heterogeneity and distributional questions into macroeconomics.

More precisely, I sketched two immediate consequences of the heterogeneous agent revolution in macroeconomics. First, the concept of “divine” coincidence of inflation and output stabilization no longer holds. There are trade-offs again between keeping inflation at some level or full employment. How central banks should act in the face of such trade-offs is a question that in democracies the principal, i.e., the people, have the ultimate say on. Second, in a real-world setting where households have different income and wealth profiles, monetary policy is no longer distributionally neutral. Just like fiscal policy, raising or lowering interest rates makes some households better off than others. This is not an accidental by-product, but one of the key features of monetary transmission through financial markets. Finally, the relationship between risk-taking financial institutions and the central bank in a fiat currency world is now widely considered a source of instability and risk-taking. By insuring aggregate risks, central banks are inviting the correlated macro risk-taking that makes the economy more fragile. This helps explain why despite the extension of central banks’ instruments and balance sheets, the world has not become a safer place in the past four decades.

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