

PONTIFÍCIA UNIVERSIDADE CATÓLICA DO RIO DE JANEIRO
DEPARTAMENTO DE ECONOMIA



Monografia de Final de Curso

**A Critique of the Federal Reserve's Conduct During The
Post Pandemic Period**

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Rio de Janeiro, junho de 2023

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"Declaro que o presente trabalho é de minha autoria e que não recorri para realizá-lo, a nenhuma forma de ajuda externa, exceto quando autorizado pelo professor tutor".

Henrique Gebran Vaisman

"As opiniões expressas neste trabalho são de responsabilidade única e exclusiva do autor".

Acknowledgements

I would like to thank my parents, Fernanda and Mauricio, for their unconditional support throughout every stage of my life and for being my role models. Thank you for always giving me your all and shaping me up to be the person I am today.

To my dear sister Sofia, thank-you for always being my safe-haven, helping me through thick and thin and never complaining.

To my old colleague, Felipe, for putting me under your wing and teaching me so much.

And to my advisor Yvan, for helping me with this project.

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Introduction

The COVID-19 pandemic has unleashed a cascade of economic disruptions, creating an unprecedented challenge for governments and central banks worldwide. In response to the ensuing economic downturn, the Federal Reserve, as the United States' central bank, implemented a series of measures aimed at stabilizing financial markets and stimulating economic recovery. However, the post-pandemic period has witnessed a surge in inflationary pressures, prompting a critical evaluation of the Federal Reserve's conduct in managing and addressing this significant macroeconomic concern.

This paper aims to provide a comprehensive critique of the Federal Reserve's management of inflationary forces during the post-pandemic era. By examining the policies and actions taken by the Federal Reserve in response to the economic fallout, we seek to assess their timing and execution.

Inflation, measured by changes in consumer price indices, has gained momentum in recent months, leading to rising concerns among policymakers, economists, and the public at large. This surge in inflationary pressures has been fueled by various factors, including supply chain disruptions, pent-up consumer demand, fiscal stimulus measures, and accommodative monetary policies. As the central bank responsible for maintaining price stability, the Federal Reserve's response to these inflationary forces is of critical importance.

This analysis will delve into the Federal Reserve's approach to inflation management, including its decisions regarding interest rates and forward guidance. By establishing certain parameters grounded on monetary policy theory, the goal is to answer the question of whether

or not the action undertaken by the FOMC members was adequate as well as understand why it may have been problematic.

This critique does not seek to undermine the Federal Reserve's efforts or dismiss the complexities involved in managing an economy during a period of heightened uncertainty. Instead, our aim is to provide an informed analysis of the Federal Reserve's conduct, in order to contribute to a deeper understanding of the challenges central banks face in maintaining price stability and fostering sustainable economic growth. This analysis also serves to foster a constructive dialogue on the efficacy of monetary policy tools in addressing inflationary pressures and explores potential avenues for improvement in future policy frameworks.

1- Was the Fed late to raise rates?

1.1- Why use the Taylor Rule?

As of 1977 the Federal Reserve has been tasked by the Congress with the dual mandate of pursuing the economic goals of maximum employment and price stability¹. Their policy decisions are therefore introduced in order to achieve such goal. Prior to commencing the evaluation of the latest sequence of monetary policy decisions done by the Fed it is necessary to understand the guidelines the U.S. central bank follows in order to deal with the changes in economic conditions and the economic outlook. The note “*Principles for the Conduct of Monetary Policy*”² from the Federal Reserve is used to present these guidelines.

The first principle states that “*monetary policy should be well understood and systematic*”. In order to achieve this, policymakers should consistently and predictably address economic changes and outlook. They should communicate their policy strategy and actions clearly to the public and remain committed to previous policy announcements unless circumstances require adjustments.

The second states that “*the central bank should provide monetary policy stimulus when economic activity is below the level associated with full resource utilization and inflation is below its stated goal. Conversely, the central bank should implement restrictive monetary policy when the economy is overheated, and inflation is above its stated goal.*”. This should be done preemptively in cases of unexpected shocks that could lead to strained economic conditions the future such was the case for the large-scale asset purchases during the Covid-19 pandemic. This plays a significant role in the understanding of the shadow-rate during zero-lower bounds environments.

And the third states that “*the central bank should raise the policy interest rate, over time, by more than one-for-one in response to a persistent increase in inflation and lower the policy rate more than one-for-one in response to a persistent decrease in inflation.*”. For this

¹ See Federal Reserve Reform Act of 1977

² See Principles for the Conduct of Monetary Policy (2018). Federal Reserve official site

principle, it is important to highlight the word “*persistent*” as it is one of the main points of contention when it comes to discussion regarding policy rates during the 2021-22 inflationary period.

With the intention of analyzing policy makers decisions based on the aforementioned principles, policy rules can be used to connect the tools available in the central bank's arsenal, namely the Federal Funds Rate, to economic variables. The Taylor Rule, introduced by economist John Taylor in 1992 and detailed in his 1993 study "Discretion Versus Policy Rules in Practice"(Taylor,1993)³ offers a monetary policy framework that advises central banks on adjusting interest rates in response to inflation and other economic factors. This rule serves as a valuable guideline for policymakers, enabling them to make informed decisions regarding monetary policy. Supported by economic theory and empirical evidence, the Taylor Rule holds credibility and serves as a useful benchmark for evaluating policy choices.

According to the Taylor Rule, the Federal Reserve should raise interest rates when inflation exceeds the target level or when GDP growth surpasses its potential. Conversely, it suggests that the Fed should decrease rates when inflation falls below the desired level or when GDP growth lags behind its potential following the second principle. The rule takes the form of a formula that links a central bank's policy rate to inflation and economic growth, assuming an equilibrium federal funds rate 2% higher than the annual inflation rate. This equilibrium rate is then adjusted based on deviations in inflation and real GDP growth from the central bank's targets. The equation the Fed uses is shown in their note “*Policy Rules and How Policymakers Use Them*”⁴ with the following coefficients:

$$FFR_t = r_t^* + \pi_t + 0.5(\pi_t - \pi^*) + 0.5(y_t - y_t^P) \quad (1)$$

where

³ See *Discretion Versus Policy Rules in Practice*

⁴ See *Policy Rules and How Policymakers Use Them – Federal Reserve*

FFR_t is the appropriate Fed funds rate

r_t^* is the neutral natural rate of interest

π_t is the inflation in the current period

π^* is the target inflation

y_t is the log of real GDP

and y_t^P is the log of potential real GDP

In cases of inflation and growth exceeding the desired targets, the Taylor Rule raises the policy rate, whereas shortfalls in these areas prompt a lowering of rates

The Taylor Rule provides policymakers with a means to effectively communicate their decisions to the public and financial markets, thereby increasing transparency and reducing uncertainty. Moreover, the rule can be adapted to incorporate various economic variables or policy preferences, allowing for flexibility in different economic contexts.

John Taylor, however, has made certain criticisms about his own rule both in his 1993 study as well as in his 1999 "*A historical Analysis of Monetary Policy Rules*" (Taylor, 1999) citing factors as the difficulty to incorporate all the relevant considerations for making policy in a complex, dynamic economy acknowledging that the model may need to be modified to incorporate different economic variables or policy preferences, depending on the economic situation. The output gap, a significant piece of the model was also targeted as a problem since it assumes that policymakers know and can agree on the size of the output gap which often isn't the case.

To deal with these problems, in this analysis, the coefficient of the Taylor Rules used are derived through an OLS regression as well as an auto-regressive model, the goal of which is to encapsulate the previous policy making profile of the FOMC in order to reduce confirmation bias. For the inconsistent interpretation of output gap, the regressions were estimated and tested with three different variables of output-gap and the one with the highest coefficient of determination was chosen as that represents the most likely M.O. of the FOMC.

After establishing this basis, in order to start discussing whether the FOMC was late to raise rates we need to establish what late would be. The following chapter start with a backward-looking monetary policy analysis followed by a forward-looking market expectations one and finish with a qualitative and quantitative examination of the inflationary process.

1.2- Backward-looking approach

The backward-looking approach is divided into two parts, the first is a classical Taylor Rule and the second is an inertial model that considers the Feds actions from previous periods. By separating these two we can reach a better conclusion by giving both a classical monetary policy theory outlook as well as a more practical one.

For the first estimation, “*Equation (1)*” was used to derive the following regression equation:

$$FFR = \beta_0 + \beta_1\pi^{ex} + \beta_2y^{GAP} \quad (2)$$

where

π^{ex} is the deviation of inflation from the target

y^{GAP} is the percent deviation of real GDP from the potential GDP

The second equation uses the same base but adds the inertial auto regressive component:

$$FFR_t = \beta_0 + \beta_1FFR_{t-3} + \beta_3 + \beta_2\pi^{ex} + \beta_3y^{GAP} \quad (3)$$

where

FFR_{t-3} is the Fed Funds rate from the previous quarter

Regarding the inflation data, personal consumption expenditures excluding food and energy (core PCE) in year over year percent change was used despite the inflation target being set in headline terms. The reason for this comes from Federal Reserve Chairman Jerome Powell comments throughout the past years where he often said that core CPE is the metric used in the FOMC decision making process:

*“Our inflation goal is for total inflation, of course, as food and energy prices matter a great deal for household budgets. But core inflation often gives a more accurate indicator of where overall inflation is headed.”*⁵ - Powell, 2022

The lower volatility presented in the core CPE also helps the model as it often alleviates shocks that are not related to the exogenous variables.

For the output gap variable, there were four main possibilities which are often found on the literature, the first is through the percent deviation of real GDP from the potential GDP, a metric the Fed has mentioned in their note *“Monetary Policy Principles and Practice”* where they describe policy rules they could use (in the note they use the log approximation). The following options are all derived through an Okun’s Law⁶ using the deviance of the current employment rate. The first of these three is proposed by the current secretary of the U.S. treasury, Janet L. Yellen in a 2017 speech⁷, where she proposed that the longer-term average level of the unemployment rate was to be used in the formulation. The 2 last variations com from president of the Federal Reserve of St. Louis, James B. Bullard these approaches use the non-accelerating inflation rate of unemployment (NAIRU) and the Longer Run FOMC Summary of Economic Projections for the Civilian Unemployment Rate Median respectively⁸.

⁵ See Speech by J. Powell titled “Inflation and the Labor Market” November 30, 2022

⁶ See PLOSSER, C. I.; SCHWERT, G. W. Potential GNP: Its measurement and significance. Carnegie-Rochester conference series on public policy, v. 10, p. 179–186, 1979.

⁷ See "The Economic Outlook and the Conduct of Monetary Policy"

⁸ See “Is the Fed using a modernized Taylor Rule” part 1 and 2



Figure 1. Output Gaps

After establishing the different types of output gap that could be used, the regressions were calculated for each of them. While comparing their Coefficient of determination, it was concluded that the option that provides the best fit for the model is the output gap derived from the percent deviation of real GDP and potential real GDP.

The period used in the calculation begins in the year 1985 and ends right before the pandemic in 2020. It was picked as it is closest date to the start of the Federal Reserve's dual mandate without covering the 1980s oil shocks and stops before the Covid shock.

The resulting coefficients are then used to estimate an appropriate rate given the economic conditions of the 2021-22 inflationary process.

Table 1. Regression Results for Classical Taylor Rule (standard deviations from the mean)

Classic Taylor Rule Regression

Dependent variable:

	Fed Funds Rate
Inflation - Target	2.065*** (0.068)
Output Gap	0.780*** (0.037)
Constant	4.260*** (0.086)
Observations	420
R ²	0.789
Adjusted R ²	0.788
Residual Std. Error	1.281 (df = 417)
F Statistic	781.264*** (df = 2; 417)

Note: *p<0.1; **p<0.05; ***p<0.0

The initial regression shows a strong significance in its estimators nevertheless it does lack predictive power. “Equation 1” was also tested and proved to have an even smaller coefficient of determination (0.593). Both fitted values are shown on the following graph:

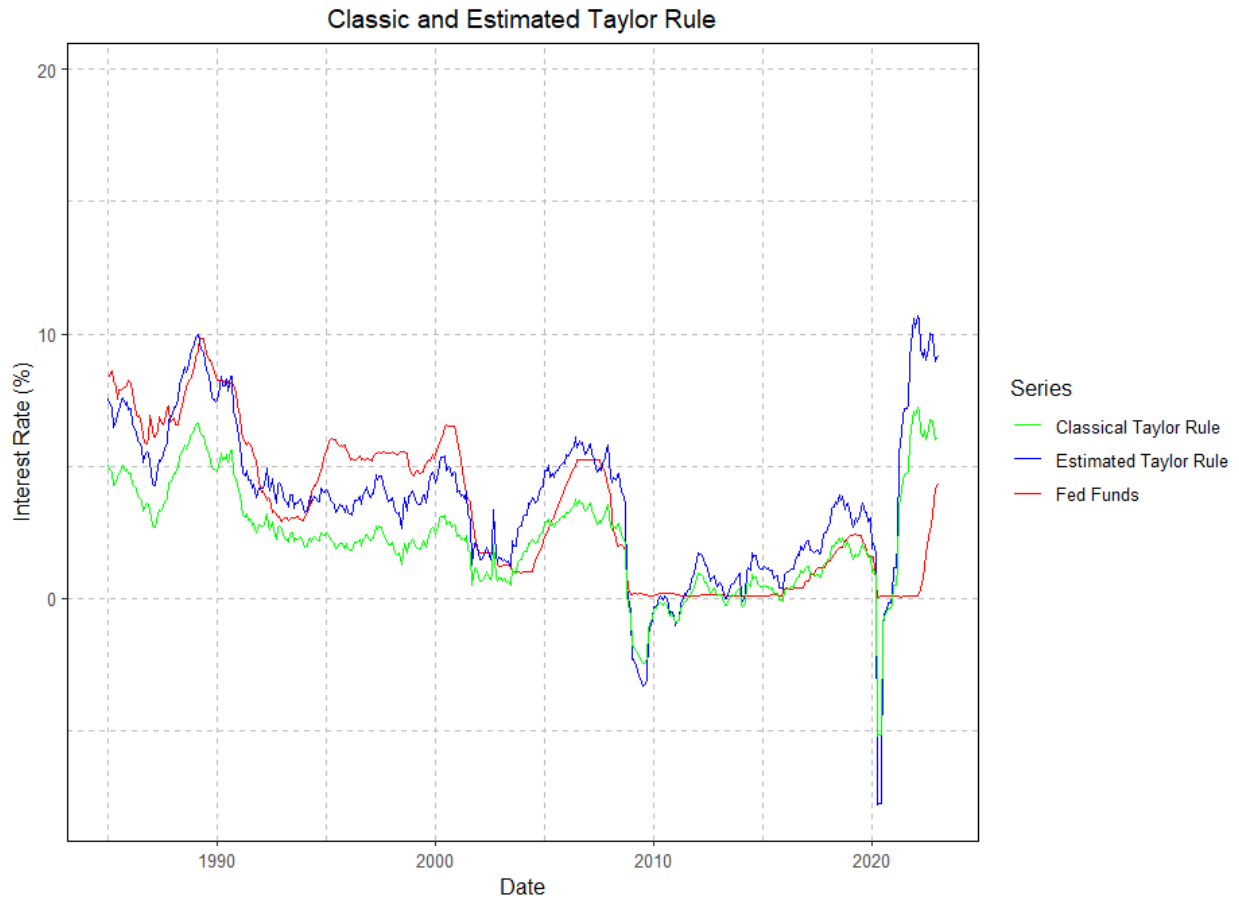


Figure 2. Fitted Values of Classical and Estimated Taylor Rules

It is clear that while it adds significant value to a discussion regarding the direction of monetary policy, even when estimated from prior FOMC decisions, the classical rule is not the most accurate at predicting the timing or size of the movements.

In order to reach a more accurate representation, the inertial version of the rule was estimated.

Table 2. Regression Results for Inertial Rule (standard deviations from the mean)**Inertial Taylor Rule Regression**

	<i>Dependent variable:</i>	
	Fed Funds Rate	
Inflation - Target	0.258***	(0.038)
Output Gap	0.156***	(0.016)
Lagged Fed Funds Rate	0.859***	(0.014)
Constant	0.629***	(0.067)
Observations	420	
R ²	0.978	
Adjusted R ²	0.978	
Residual Std. Error	0.416 (df = 411)	
F Statistic	6,132.609*** (df = 3; 416)	

The
results show
significance of

Note:

*p<0.1; **p<0.05; ***p<0.01

regression
the

an inertial Taylor rule model as a display of how the Fed operates their monetary policy. In the same note as the classical rule the Fed presents the inertial rule they use:

$$R_t^I = 0.85R_{\{t-1\}} + 0.15 \left[r_t^{\{LR\}} + \pi_t + 0.5(\pi_t - \pi^*) + (y_t - y_t^P) \right]$$

where

R_t^I is the appropriate Fed funds rate for the quarter

$R_{\{t-1\}}$ is the Fed funds rate of the previous quarter

(4)

When tested, it also shows a smaller R^2 (0.927) when compared to the estimated one.

By using the coefficients given by the regression, we can then estimate how the FOMC would normally act in order to fight rising prices.

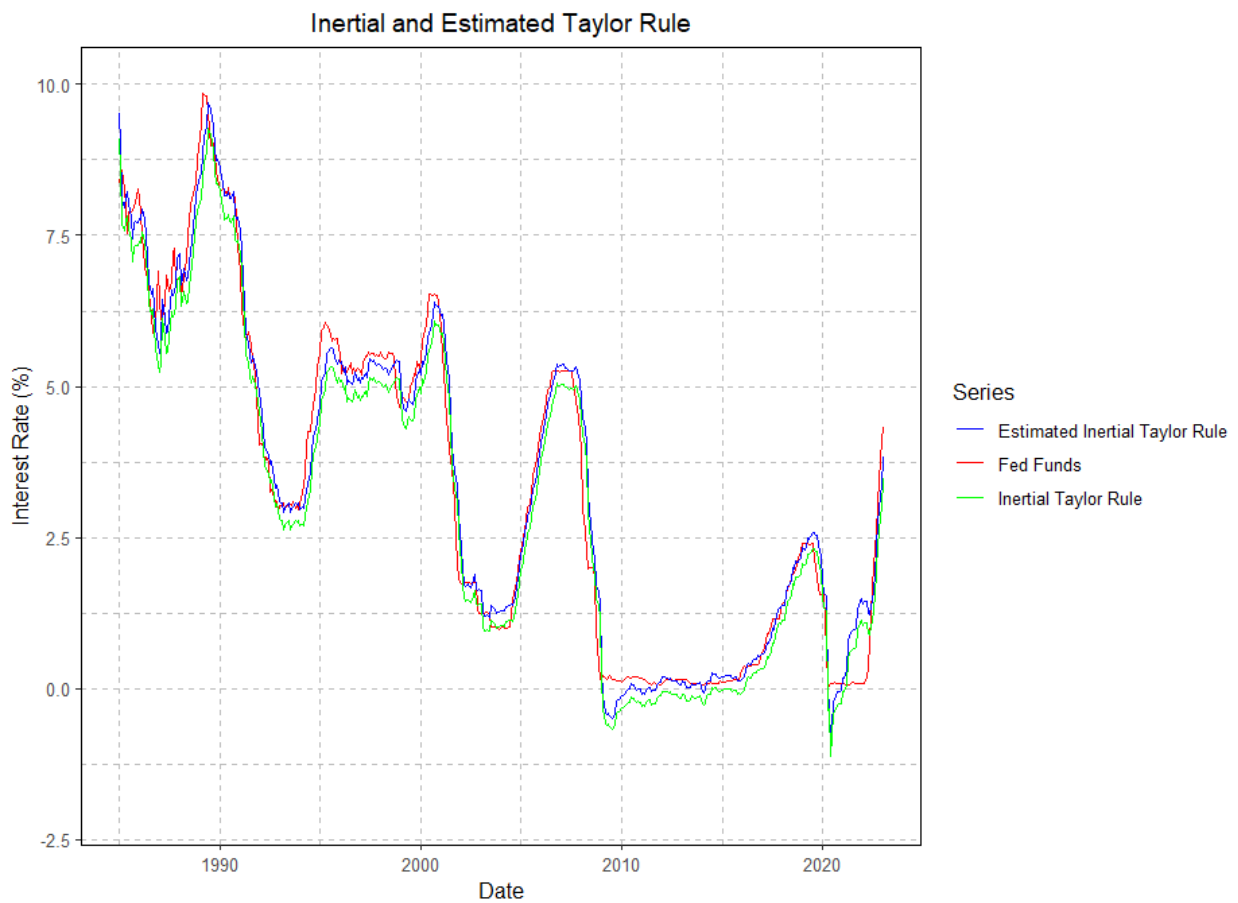


Figure 3. Fitted Values of Inertial and Estimated Taylor Rules

The estimated inertial rule is therefore the best variation of the models presented in this paper when it comes to estimating the behavior of the Federal Reserve regarding their interest rate decisions and will therefore be the metric used for the analysis on whether or not the FOMC was late to raise rates.

1.3- The forward-looking approach.

For this approach, the 2-year treasury is the object of analysis. While a lot of work regarding the effects of forward guidance can be found in the current literature, most papers such as *Del Negro et al., (2015), "The forward guidance puzzle"* or *Campbell et al. (2012), 'Macroeconomic effects of Federal Reserve forward guidance' (2012)* explore the effects of the FOMC forward guidance when the interest were at the effective zero-bound range and the literature on the effects of forward guidance specifically for rate hikes environments is lacking. What can be taken, however, from the current available literature is that the relationship between the forward guidance and treasury rates is in fact significant.

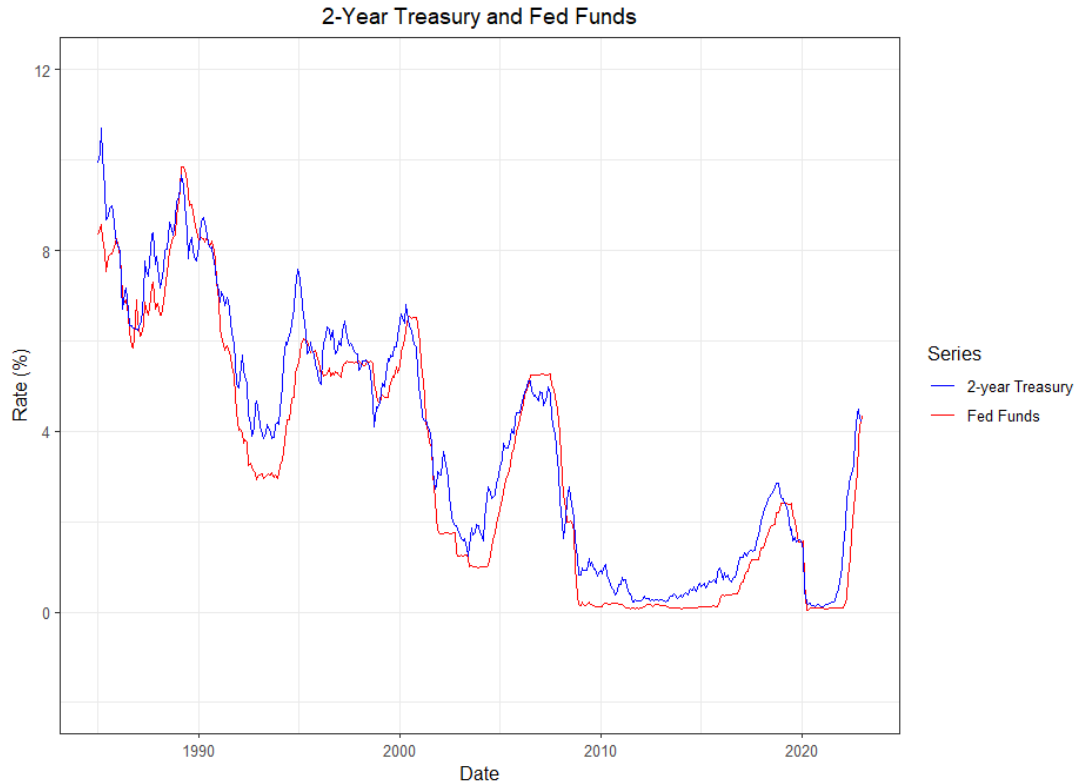


Figure 4. 2-Year Treasury Rates and Fed Funds

While this approach doesn't come from monetary policy theory, the market expectations of how the FOMC will be raising rates does show what most market participants expect as the logical futures steps to be taken in monetary policy. The purpose this serves is not to establish where the Fed funds should be but where it is likely going to end up in the near future as it is illustrated in the graph (see figure. 4) and reinforced by Michelle W. Bowman, member of the Board of Governors of the Federal Reserve System in her speech by saying *"Outside of such periods⁹, our focus should be on changes in the target range for the federal funds rate-the Committee's primary tool for implementing monetary policy decisions-in communicating the stance of monetary policy and in providing more qualitative guidance regarding how the Committee will be thinking about its future policy decisions. Our recent experience with using qualitative forward guidance in our post-meeting statements illustrates this point. In the first half of this year, when the Committee began to signal that it would increase the target range for the federal funds rate and that it anticipated that "ongoing increases in the target range will be appropriate," longer-term interest rates rose, and financial conditions tightened."*¹⁰

⁹The periods in question are when rates are and will likely remain on the effective zero-lower bound.

¹⁰ See Michelle W Bowman: Forward guidance as a monetary policy tool - considerations for the current economic environment (2022)

1.4- Critiquing The FOMC

Having determined the appropriate metrics for the analysis, the following graph zooms in on the period in question.

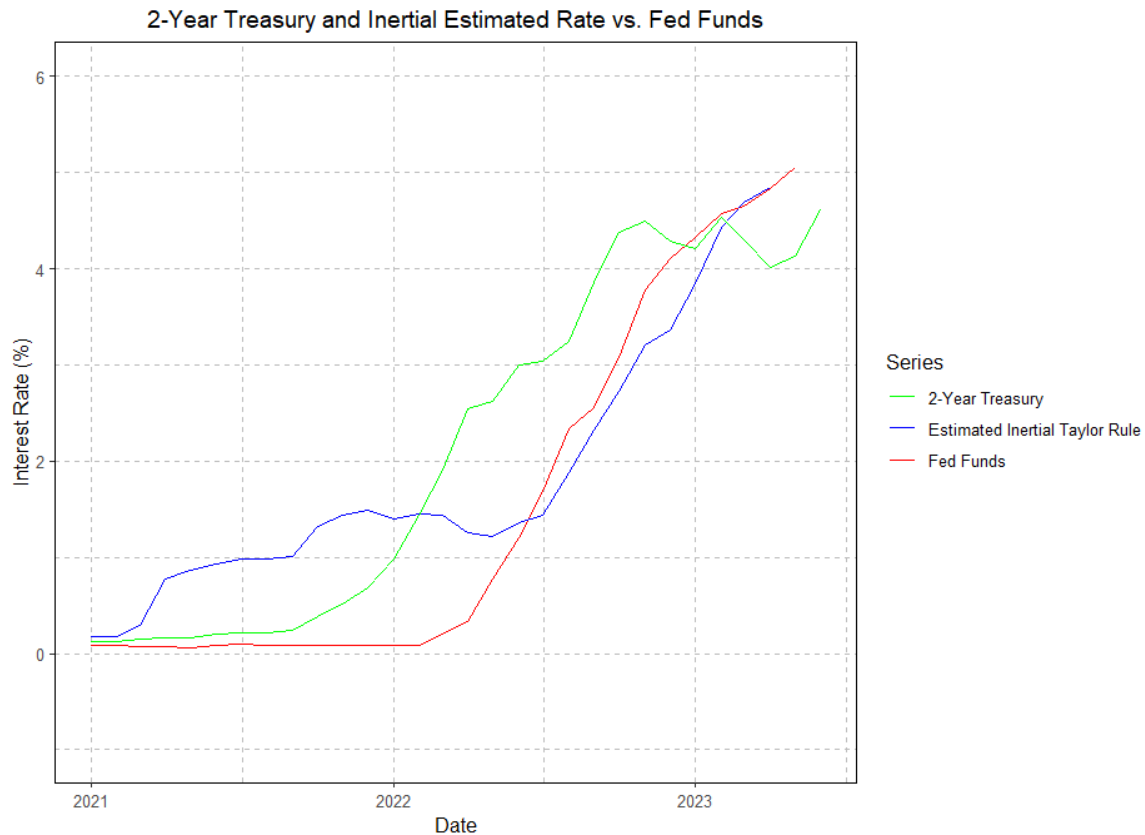


Figure 5. Fed Behavior Analysis

Starting with the estimated inertial Taylor Rule this method, as it is based entirely on monetary policy theory, attempts to eliminate any bias by focusing entirely on data. It is important to note that the rate prescribed for that time in the inertial rule, unlike the classical one, is not the “appropriate” terminal rate. The rate presented is therefore much lower than one would deem appropriate for the presented economic conditions as a result of the strong coefficient of the lagged Federal funds rate of approximately 0.85 that represents the smooth hike cycle the Fed usually seeks to incorporate.

It is visible then that, according to the rule, the Federal Reserve should have started raising rates in winter 2021 (January) instead of late spring 2022. It took the FOMC participants 15 months to start raising rates when in the March 2022 FOMC meeting it was

voted for a 0.25 basis points hike. The committee did soon pickup the pace surpassing the inertial rule estimate in only 5 months however when it comes to question of whether they were late or not, through the lens of the, backward looking, monetary policy, the answer is a resounding yes.

The same answer holds true with the forward-looking point of view. In this case however the Federal Reserve took much longer to reach the expected rate.

1.4.1- Focusing only on Inflation

During the post pandemic period the FOMC had to deal with a significantly overheated U.S. economy and the inflation that ensued. According to their principles for conducting monetary policy, the interest rate should have been risen by more than one for one, once inflation surpassed their 2% target and yet, it was only when inflation had already surpassed 5% that rates were raised (see figure. 6). With just this information one could already argue that the Fed was late however going back to their principles, the reason for the Fed to not act against inflation earlier can be traced back to a single word, "persistent", while the core CPE had already reached digits that would warrant rate hikes, the thought that the process was transitory allowed policy makers to substantially delay their response.

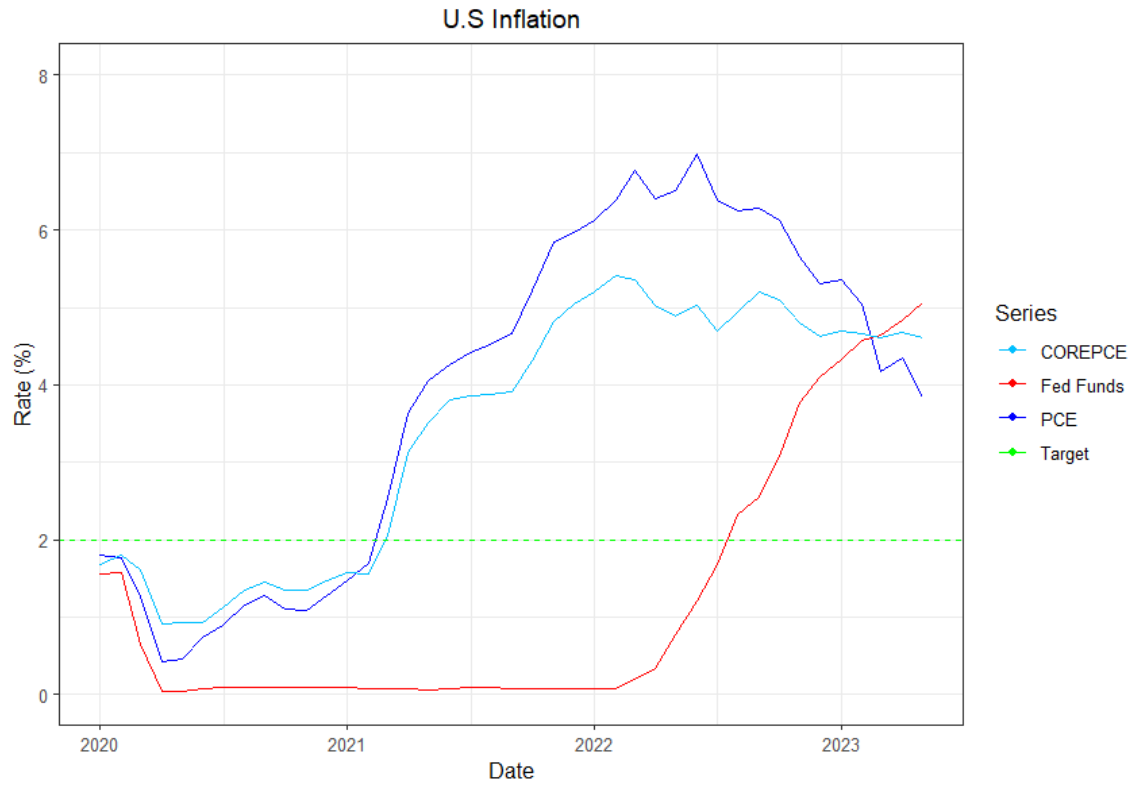


Figure 6. U.S. Inflation and Fed Funds

The following chapter aims to develop this idea and show how the FOMC could have predicted that inflation was in fact not transitory.

2 - The Inflationary Process of the Post Pandemic Period

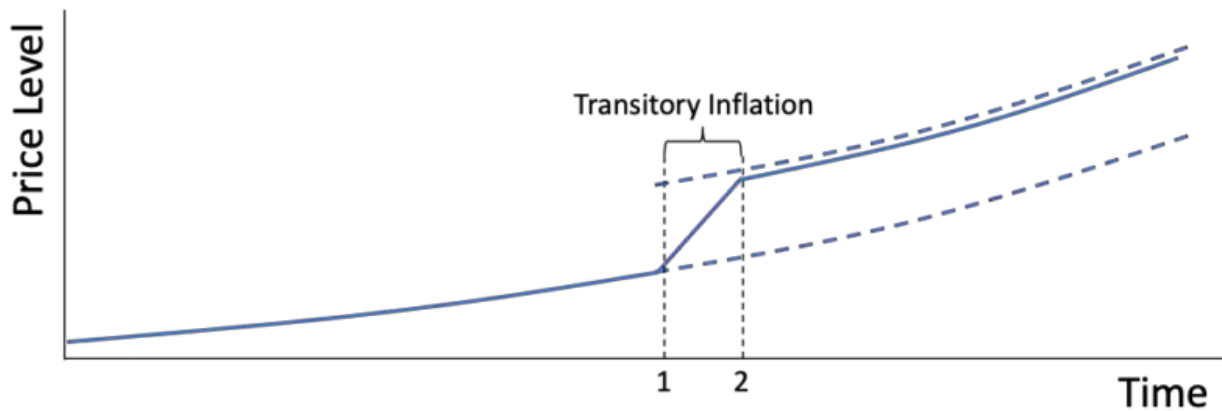
While the economy was at full employment, prices had been continuously rising since the first quarter of 2021. Despite the fact that inflation had already been accelerating for a few months at that time, it was only in November of 2021 that the Fed pivoted on its aggressive expansionary monetary policy by announcing it would begin tapering its large-scale asset purchase, which began taking place in 2020 due to the Covid-19 pandemic, and later in March, 2022 the FOMC deemed appropriate to start raising rates, something the majority of economists and even members of the FOMC now acknowledge to have taken too long.

The cause for such a delayed policy adjustment is a result of the Fed's misreading of the inflationary process as for most of 2021 the word most associated with the current inflation was "transitory" but what is a transitory inflationary process? And why did the Federal Open Market Committee perceive inflation in such a way?

According to The American Institute of Economic Research, transitory inflation is "*a rate of inflation that does not remain high permanently. In some cases, the temporary high inflation rate is followed by a period of lower inflation.*"¹¹ Meaning that the upsurge in prices was caused by shocks and would soon return to its regular pattern. There are then two possible patterns for transitory inflation:

¹¹ See "What does transitory inflation really mean" by AIER

Transitory inflation with a permanent price level effect.



And transitory inflation without a permanent price level effect.

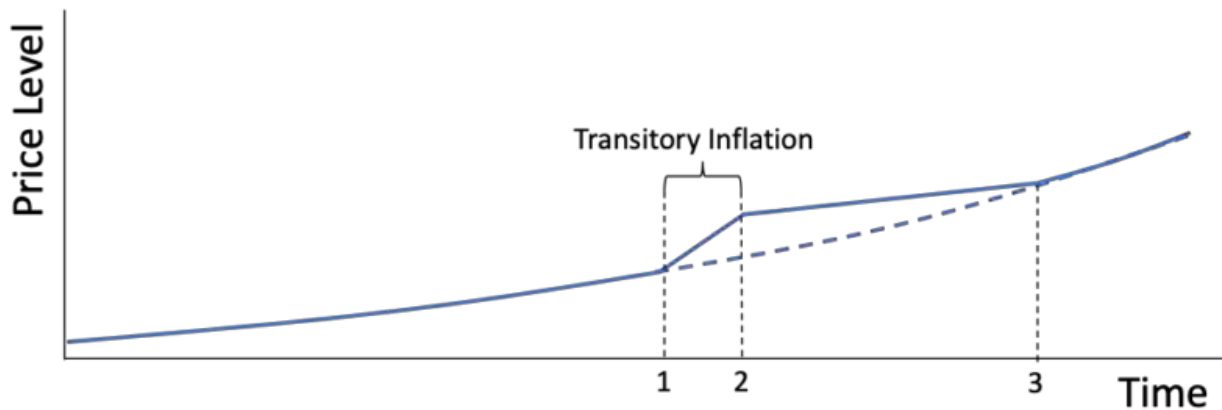


Figure 7.. Transitory Inflation

Now as to why it was believed this was the case for the U.S. economy, Fed Chair Jerome Powell and other Fed officials argued that high inflation was caused by a series of unusual circumstances, such as supply chain issues caused by the reopening of the economy and the base effects of the extremely low PCE numbers of March and April 2020. It was also

argued that inflation was not broad-based, being driven only by a handful of goods, used cars being used consistently as an example (see figure 9).

In reality, while the shocks contributed to a likely transitory, cost-push, inflation causing an aggregate supply shift to the left, there was not only wage-inflation but also a demand-pull inflationary process taking place. In the following chapter data will be presented to further prove this point.

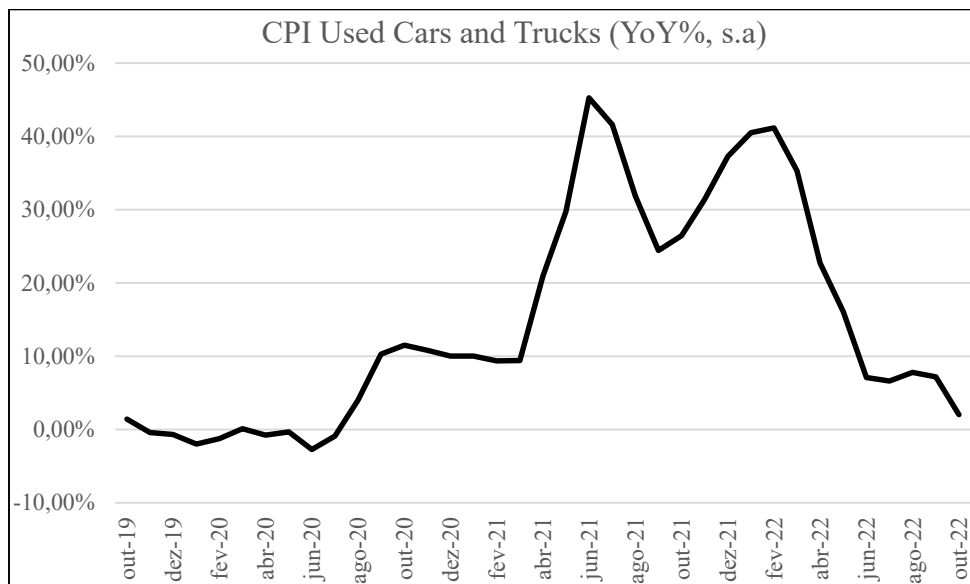


Figure 8. Used Cars Inflation

2.1 The Case for Transitory

The COVID-19 pandemic caused disruptions in global supply chains, including factory closures, transportation challenges, and restrictions on movement and trade. These disruptions led to shortages of key inputs and components, impacting various industries (Amiti et al., 2021). As the focus of this paper is not the transitory aspects of inflation, these will only be covered briefly and mostly through reference.

One notable supply chain disruption has been the shortage of semiconductors, used in many electronic devices including cars. The production of these chips is an extremely complicated process requiring massive factories to be completed. These factories take

billions of dollars and at least three years to be built¹² because of that the chip shortage did not have a close end in sight. This shortage has affected multiple industries and has been a significant challenge.¹³

Shipping and logistics challenges have also emerged, including port congestion, limited container availability, and increased freight costs. These challenges have led to delays in the movement of goods and increased transportation costs reaching upwards of 870% increases¹⁴. The problem with the increase on shipping cost goes even further as the contracts are closed 6 to 24 months before the actual shipping of products and because of that despite prices having eased on the following months the effects of these price drops on inflation are substantially delayed.

Disruptions in the availability of raw materials, such as lumber, steel, and commodities, have been observed as well. These disruptions have contributed to increased input costs and supply constraints¹⁵

It is clear that there were substantial reasons for the FOMC to consider inflation transitory. The goal of this paper is therefore not to prove that this factor was not at play but to show how at the same time of the supply shocks other factor were leading to a longer lasting inflation profile.

2.2 - Consumer Data

A significant factor regarding the intensity of inflation during 2021 was consumer strength and the demand-pull inflation it generated. The U.S. government issued three Economic Impact Payments during the coronavirus pandemic for those who were eligible. The amount issued was \$1,200 in April 2020, \$600 in December 2020/January 2021 and \$1,400 in March 2021. These checks had a very clear impact on consumers disposable income (see figure 10), as well as on their spending.

¹² See INTEL “What does it take to build a fab”

¹³ See Suedekum & von Gaudecker, (2021)

¹⁴ See Freightos Logistics

¹⁵ See OECD data

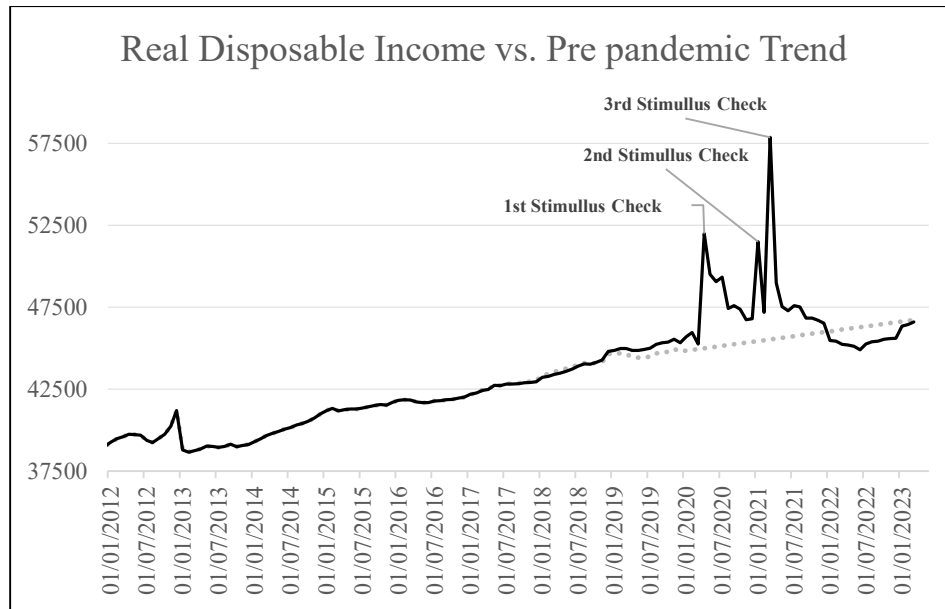


Figure 9. Disposable Income

The third wave of checks allowed for consumer spending to recover and even surpass its pre-pandemic trend. This recovery was guided first by goods spending and services lagging for a couple months. Despite the drop of disposable income in January 2022, consumer spending remained elevated showing signs that the increased demand was not transitory or at least not as transitory as it was once thought.

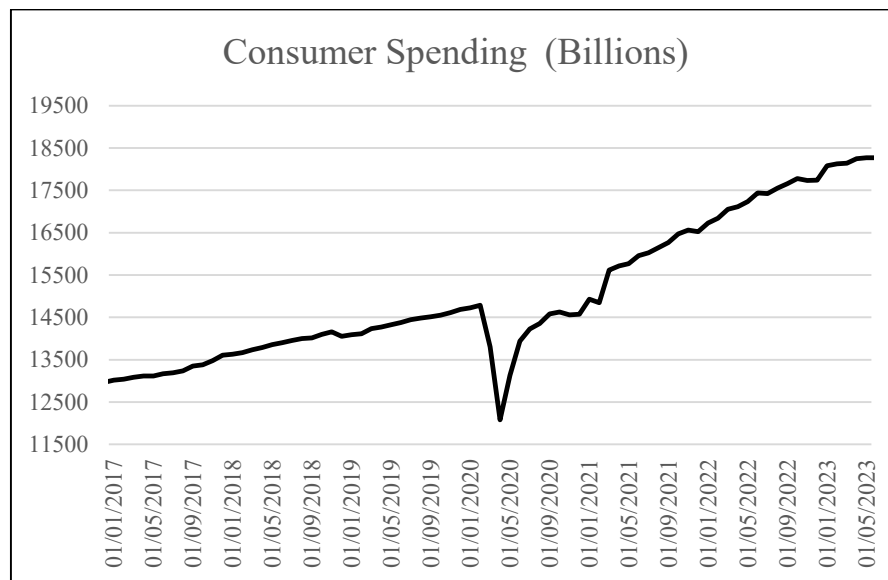


Figure 10. Consumer Spending

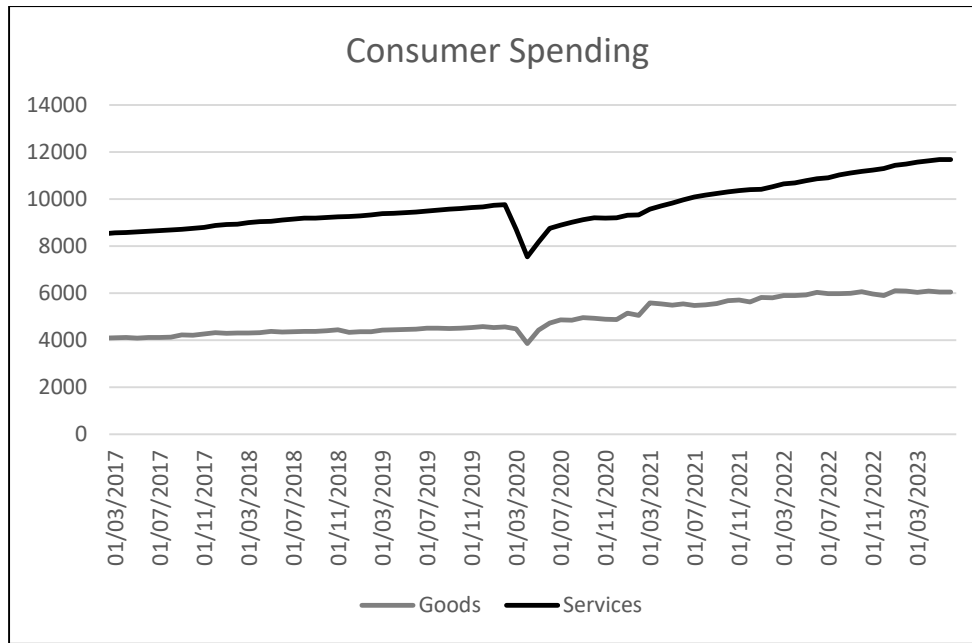


Figure 11. Consumer Spending by Type

It was expected that as the reopening took place, spending would transition from goods to services and the price pressures would transition with it. The stimulus packages coupled with the high performance of the U.S stock market led household assets to skyrocket (see figure 12) subsequently causing issues in the Fed's fight against inflation as a strong consumer makes recalibrating domestic demand harder as well as, changing certain labor market dynamics (will be presented further in this paper).

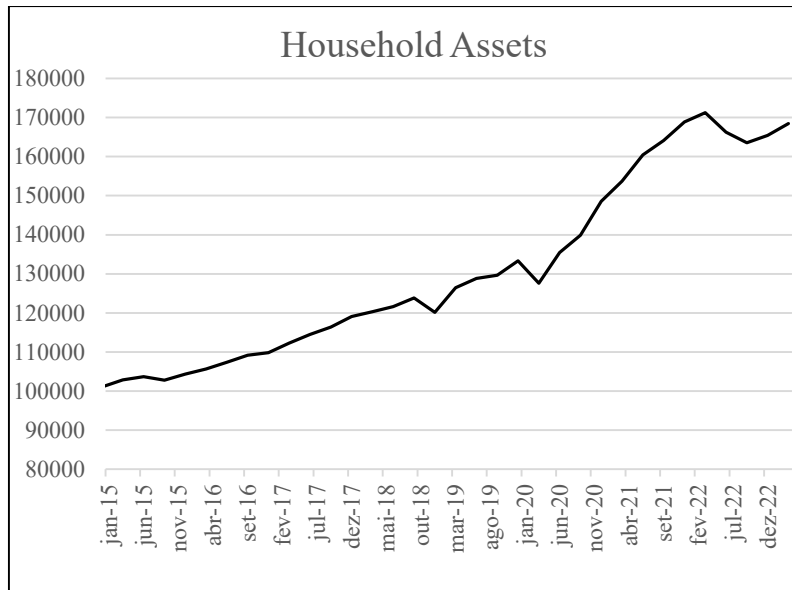


Figure 12. Household Assets

While services spending did in fact increase throughout the year, goods spending remained strong for longer than expected causing inflation to increase on both ends.

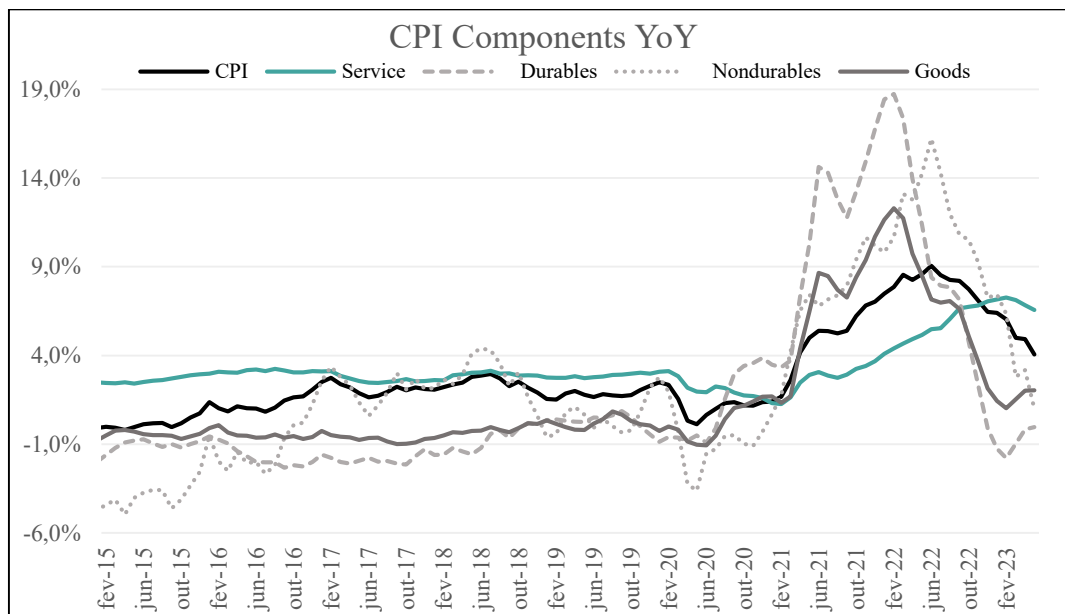


Figure 13. CPI Components

2.3 – The Labor Market

The post pandemic labor market conditions had never before been seen. With a substantial amount of data suggesting it to be the tightest it has ever been with a research paper done by Alex Domash and Lawrence H. Summers¹⁶ reaching the conclusion that “firm-side indicators are highly significant for predicting wage inflation, and that the current level of vacancies and quits observed in the labor market correspond to a degree of labor market tightness previously associated with unemployment rates below 2 percent.”. In recent years the original Philips curve of the U.S. had substantially flattened however the post pandemic period saw a return to Philips original structure. The associated 2 percent unemployment found in the paper, therefore, is a dangerous sign for the U.S inflation.

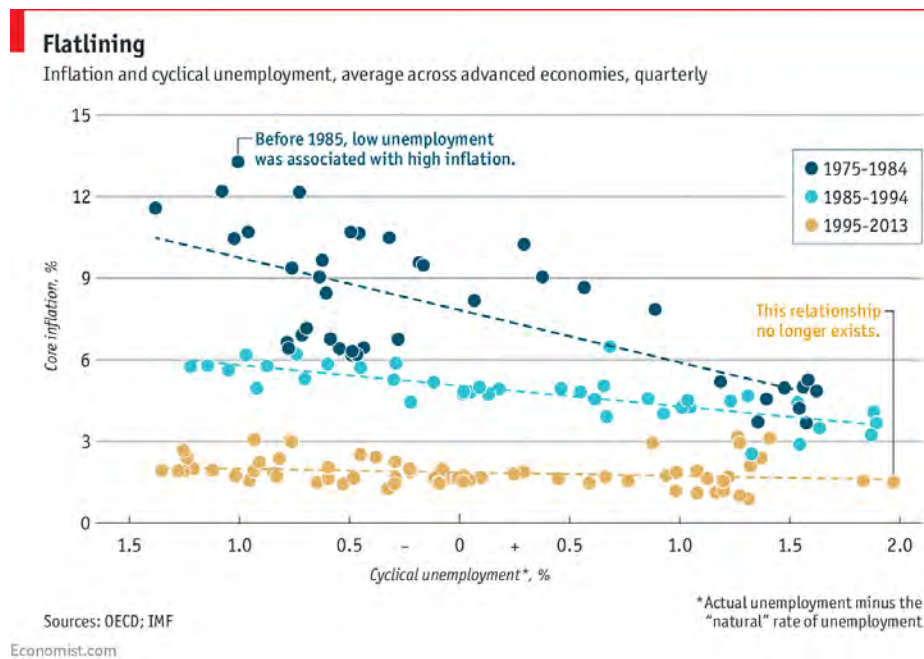


Figure 14. U.S. Philips Curve

¹⁶ See NBER How Tight are U.S. Labor Markets?

**Figure 1 Inflation vs. Unemployment
May 2020 to May 2021**

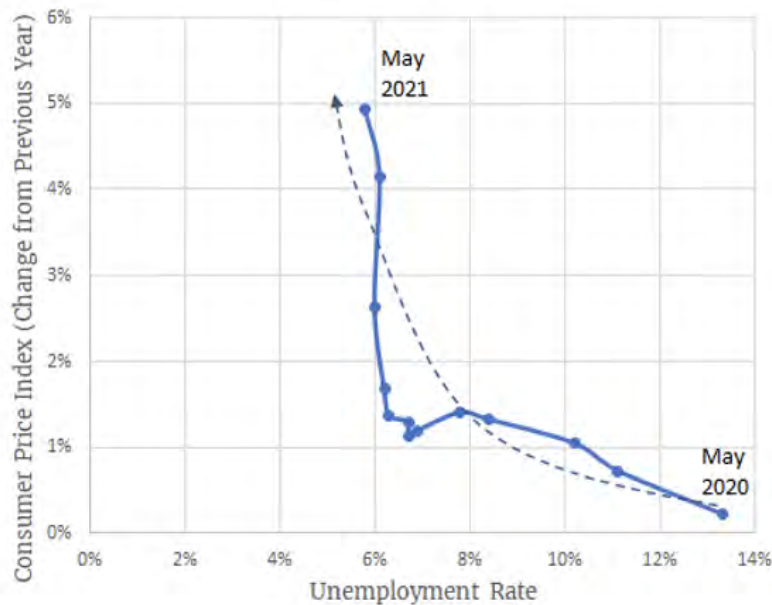


Figure 15. Recent Philips Curve¹⁷

In his original work, A. W. Philips, presents an exponential relation between unemployment rate and wage inflation which picks up significantly after it crosses the 3% threshold.

After the initial shock caused by the Covid-19 pandemic, it was expected for the labor force participation rate to return to its normal level however this proved to not be the case (see figure 17). The cause for this was presented in the NBER paper “Has The Willingness to Work Fallen During The Covid Pandemic?” by R. Jason Faberman, Andreas I. Mueller, and Ayşegül Şahin.

This paper analyzes the impact of the Covid pandemic on labor market underutilization and labor supply behavior of workers. The study builds upon the Aggregate Hours Gap (AHG) framework developed by Faberman, Mueller, Şahin, and Topa (2020)¹⁸. The findings reveal contrasting patterns between the AHG and the unemployment rate during

¹⁷ Source: Is the Phillips Curve Back? When Should We Start to Worry About Inflation?

¹⁸ See Job Search Behavior among the Employed and Non-Employed

the Covid pandemic compared to the Great Recession. Despite the pandemic, the labor market remains relatively tight, with the AHG already below its pre-pandemic level by the end of 2021. This is primarily due to individuals leaving the labor force and part-time workers experiencing a significant drop in desired work hours.

The decline in desired work hours is more pronounced than the decrease in the labor force participation rate and remains consistent throughout the pandemic. To further understand this phenomenon, the researchers conduct a counterfactual exercise by assuming desired work hours remain at their pre-pandemic average within specific labor force and demographic groups. This analysis reveals that the decline in desired work hours accounts for a 2.5 percentage point (12.5 percent) reduction in the AHG relative to its estimated value at the end of 2021, explaining most of the discrepancy between potential work hours and the labor force participation rate.

Contrary to the popular notion that reduced labor supply is primarily driven by women responding to childcare demands, the study finds that the decline in desired hours affects various demographic groups, with larger declines observed among those with less than a college degree. The decrease is concentrated among individuals who prefer infrequent work and part-time hours, referred to as the intensive margin of labor force participation.

The research also indicates that the Covid pandemic likely plays a significant role in the observed reduction in desired work hours, including lower desired hours among individuals in jobs with higher potential exposure to Covid. However, the effects on job search behavior diminish by the end of 2021. The study identifies persistently higher reservation wages among most individuals during the pandemic, suggesting a reassessment of their labor supply decisions.

Overall, the findings suggest that a general decline in willingness to work has led to a contraction in labor supply, which persists throughout the Covid pandemic and the following periods. This decline has contributed to the rapid tightening of the labor market since the start of the pandemic.

The conclusion to the paper leads us to believe that at least a portion of the decrease would likely be permanent if no Fed action were to be taken. The rebound happened after the rate hikes and was more prevalent on the prime age participants.

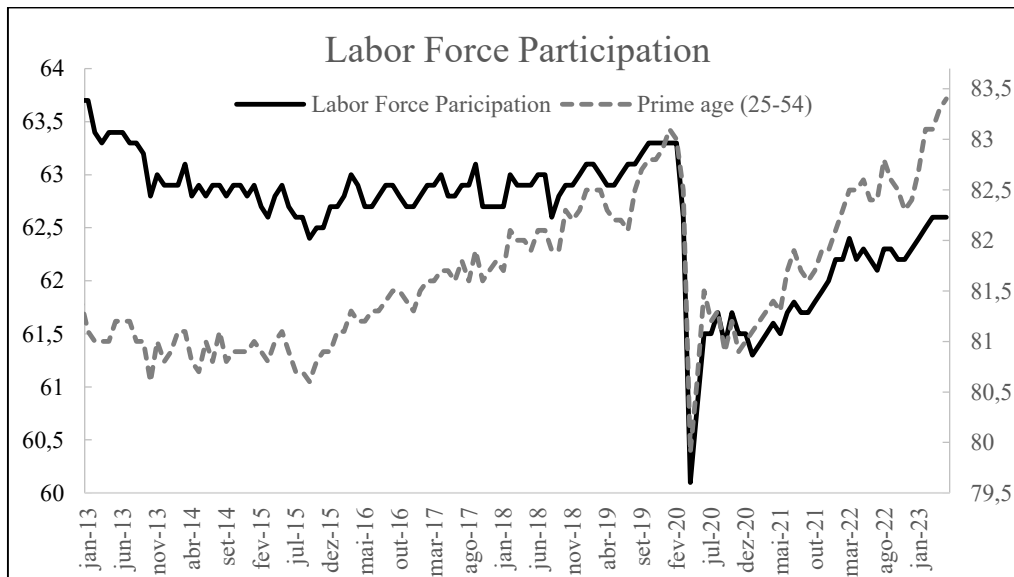


Figure 16. Labor Force Participation

The tightness can be very clearly observed when analyzing the amount of job openings per unemployed worker (see figure. 17). This number which peaked at 2.0 and is currently at 1.8 is the highest it has ever been.



Figure 17. Job Opening per Unemployed Workers

This degree of labor market tightness requires a significantly higher Federal Funds Rate to fight off inflation as the increased labor demand generated by the strong economy coupled with the shorter demand leads to substantial wage inflation.

The wage increases have been broad base affecting all quartile of earners which shows how the entirety of the job market is extremely tight (see figure.18) and the higher growth levels on job switcher (see figure.19) shows how employers are having to offer significantly higher wages in order to be able to poach employees. The wage increases are more significant for higher earnings individuals representing that higher qualified workers were harder to hire during the period.

In conclusion, the labor market environment of the 2021-22 period was undeniably extremely tight and the wage increase resulted from it led to a progressively stickier inflation reaching a point where Fed action was required in order for it to be controlled.

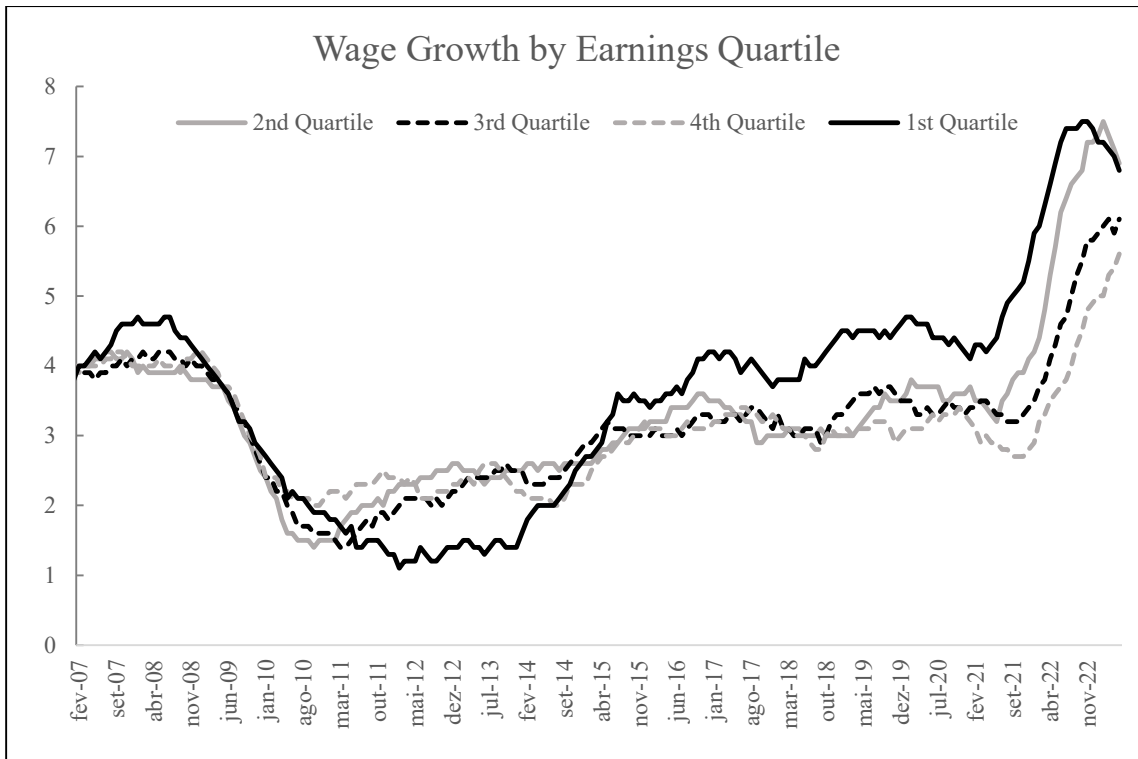


Figure 18. Wage Growth by Earnings Quartile

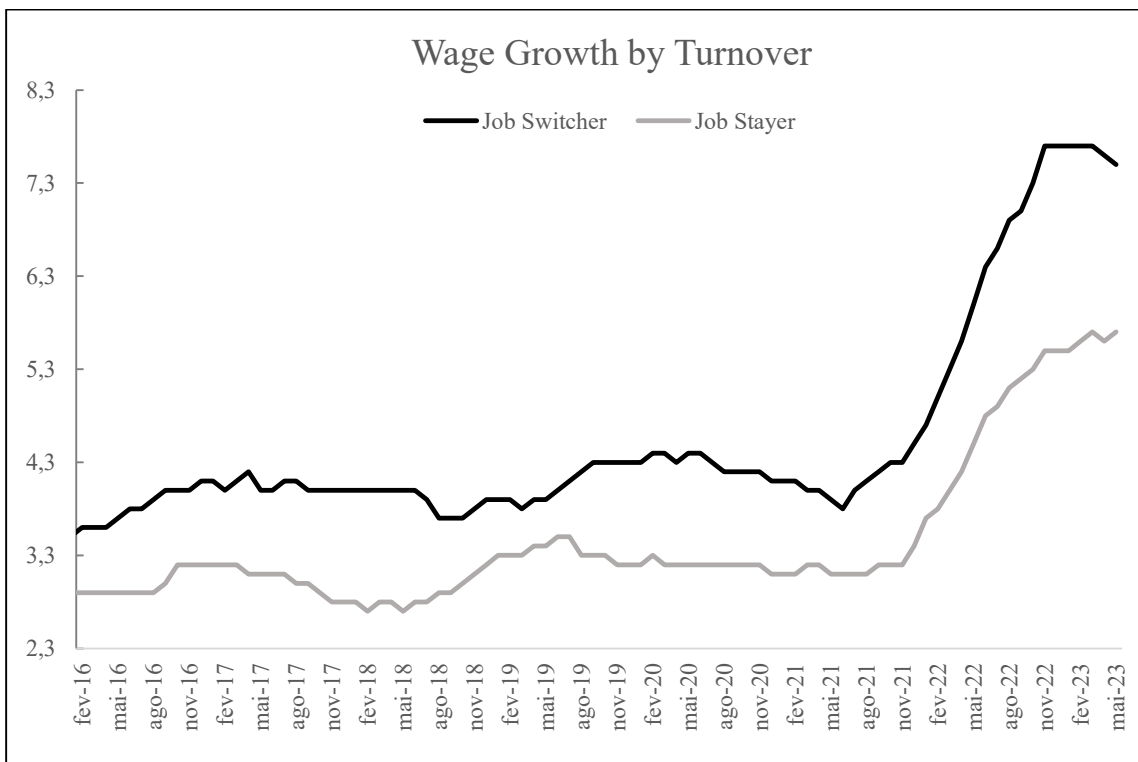


Figure 19. Wage Growth by Turnover

Conclusion

The goal of this paper was to provide an answer to the questions of whether the Federal Reserve was late when it came to dealing with inflation and why such a policy error could happen.

In the past chapters multiple interpretations for the first question were presented including a backward looking, a forward looking and an inflation only approach. The answer in all of this methods, although slightly different in their details, was **yes**. The data presented throughout 2021 and early 2022 proved to be enough for an understanding that rates needed to be higher given the economic conditions. The reason for the delay in policy was also presented in an attempt to explain why the policy error that occurred.

The more broad-based non transitory inflation may have been noticed earlier if the focus for its causes had shifted from the supply shocks to the labor market and strong consumer data which lead to stickier inflation.

In conclusion, the Federal Reserve could have acted in a more appropriate way in dealing with inflation. The delay in policy could lead to problems down the line in financial conditions and the overall state of the economy.

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The economist