Why Do Workers Dislike Inflation? Wage Erosion and Conflict Costs*

Joao Guerreiro Jonathon Hazell Chen Lian Christina Patterson

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Abstract

How costly is inflation to workers? Answers to this question have focused on the path of real wages during inflationary periods. We argue that workers must take costly actions ("conflict") to have nominal wages catch up with inflation, meaning there are welfare costs even if real wages do not fall as inflation rises. We study a menu-cost style model, where workers choose whether to engage in conflict with employers to secure a wage increase. We show that, following inflation, wage catchup resulting from more frequent conflict does not raise welfare. Instead, the impact of inflation on worker welfare is determined by "wage erosion"—how inflation would lower real wages if workers' conflict decisions did not respond to inflation. This result implies that measuring welfare using observed wage growth understates the costs of inflation. We conduct a survey showing that workers are willing to sacrifice 1.75% of their wages to avoid conflict. Calibrating the model to the survey data, the costs of inflation incorporating conflict are two times larger than the costs of inflation via falling real wages.

*Guerreiro: UCLA, jguerreiro@econ.ucla.edu; Hazell: London School of Economics and CEPR, j.hazell@lse.ac.uk; Lian: UC Berkeley and NBER, chen_lian@berkeley.edu; Patterson: University of Chicago and NBER: christina.patterson@chicagobooth.edu. The survey was approved by University of Chicago IRB, ID number 24-0060. We thank Salomé Fofana, Seyed Hosseini, and Daniela Villacreces Villacis for excellent research assistance. We thank Hassan Afrouzi, Andrew Atkeson, Adrien Auclert, David Baqaee, Matthias Doepke, Martin Eichenbaum, Joel Flynn, John Grigsby, Guido Lorenzoni, Erik Hurst, Loukas Karabarbounis, Ben Moll, Laura Pilossoph, Ricardo Reis, Matthew Rognlie, Jon Steinsson, Joe Vavra, Conor Walsh, and seminar participants at the Bank of England, the Bank of Portugal, the Bank of Portugal and Bank of Spain Macroeconomics Conference, the "Pizzanomics" Conference, LSE and the University of Surrey for comments that greatly improved the paper.

1 Introduction

People think inflation is one of the United States' worst problems (Pew Research Center, 2022, 2023). Why do people dislike inflation so much? One reason could be that prices rise faster than nominal wages during inflation episodes, meaning real wages fall and workers become poorer (Shiller, 1997; Stantcheva, 2024). A classic view, for instance from Fischer and Modigliani (1978) or Mankiw (2020)'s textbook, suggests that this cost of inflation is small. The argument is that nominal wages generally keep up with prices after an inflationary shock. As a result, real wages do not persistently fall and workers do not suffer much through this channel.

This paper instead studies *how* nominal wages catch up with prices. We propose that firms do not automatically give workers raises in response to inflation. Instead, workers have to fight for these raises by placing themselves in conflict with employers. Inflation can then harm workers even if nominal wages keep up with prices and real wages do not fall. What matters for workers is not wage growth per se, but rather wage growth net of the "conflict costs" that workers had to pay. We measure conflict costs using a survey of US workers, who, on average, would sacrifice 1.75% of their wages to avoid conflict. In a menu cost-style model calibrated to our estimates, conflict doubles the costs of inflation to workers.

We start the paper with motivating survey evidence about the relationship between conflict and inflation. We fielded a survey to 3000 US workers at the start of 2024, in the aftermath of the post pandemic inflation, and arrive at two conclusions. First, we find that conflict is important for determining wage growth. A significant portion of workers say they took costly actions—that is, they engaged in conflict—to achieve higher wage growth than their employer offered. These actions include having tough conversations with employers about pay, partaking in union activity, or soliciting job offers. We find that conflict leads to higher wages, as participants who took these actions believe their wage growth would otherwise have been 3 percentage points lower. Conversely, those who did not take the costly actions believe conflict would have raised wages by 2 percentage points, suggesting sizable conflict costs that offset the benefit of higher wages.

Second, we investigate when workers engage in conflict and find that conflict rises with inflation. Consistent with previous findings from Stantcheva (2024), respondents say that the costly actions were primarily motivated by wanting wages to catch up with inflation. Additionally, when asked how they would behave at different rates of inflation, respondents were more likely to conflict with employers at higher levels of inflation. We complement this result with real-world evidence that conflict is more common when inflation is higher. In cross-country panel regressions using data from 1964 to 2022, we document a robust correlation between inflation and conflict, proxied by the prevalence of labor market strikes.

We then use a model to investigate how conflict affects the welfare costs of inflation. In the model, workers receive a default nominal wage offer from their employer, in line with our survey evidence. Unless the offer is fully indexed to inflation, the worker's offered real wage falls when inflation rises. In response, workers optimally choose whether to conflict with employers. Conflict increases the worker's nominal wage beyond their employer's offer, so that wages catch up with inflation. Similar to the menu cost literature, workers face idiosyncratic productivity shocks, and the conflict cost of increasing wages beyond the employer's offer takes the "Calvo-plus" form of Nakamura and Steinsson (2010) and Auclert et al. (2024).

Consistent with our motivating evidence, conflict is more likely in the model when inflation increases. Intuitively, as inflation increases, workers receive greater real wage cuts absent conflict. As their real wage lags further, the wage gain that they can achieve through conflict becomes larger, meaning more workers choose conflict. Inflation fails to increase conflict only if employers' default wage offers are fully indexed to inflation.

Our main analytical result is that the wage catch up after inflation does not raise workers' welfare. The reason is that wage catchup requires more frequent conflict. The extra conflict costs exactly cancel out the benefits of the higher wage growth that conflict causes. Exact cancellation follows from worker optimality and the envelope theorem of Milgrom and Segal (2002), applied to discrete conflict choices. Therefore the path of real wages after an inflation shock is not sufficient for welfare. Instead, we show that the impact of inflation on worker welfare is determined by "wage erosion"—how inflation would lower real wages if workers' conflict decisions did not move with inflation.[1] As such the welfare costs of inflation in the labor market are potentially significant even if real wages do not fall. Moreover unlike falls in the real wage, which redistribute from workers to firms, conflict costs represent aggregate losses.

How large are the welfare costs of inflation due to conflict? We show that two factors matter: the cost to workers of conflict with an employer, and whether employers' default wage offers index to inflation. We quantify both factors using our survey. First, we find that workers dislike taking actions that lead to conflict with employers. According to our survey, the median worker would sacrifice 1.75 percent of their wage to avoid conflict. We validate the survey by showing that our measure of conflict costs predicts workers' self reported conflict decisions in 2023. Second, workers believe that employers' wage offers are weakly indexed to inflation. Specifically, we asked workers to consider various hypothetical levels of inflation. Absent conflict, workers believe that employers will raise their wage offer by 0.05 percentage points for every percentage point increase in inflation. Together, these

[1] Our definition of wage erosion relates to the intensive margins of price adjustment in Auclert et al. (2024), however we study wage instead of price setting and normative rather than positive implications. Previous work by Jo (2019) and Costain, Nakov and Petit (2019) studies positive implications of state dependence in wage setting.

estimates suggest that the welfare costs of inflation to workers are substantial. Workers either pay large costs from conflict, or experience large real wage falls if they do not engage in conflict.[2]

We then quantify how conflict affects the welfare costs of specific inflationary episodes. We show how to discipline our model using the survey measures. We use the Sequence-Space Jacobian methods developed in Auclert et al. (2021) and Auclert et al. (2024) to solve the model. We then study how conflict alters the welfare costs of the post pandemic inflation of 2021-2023. We find that the costs of inflation to workers, considering conflict costs, are at least twice as large as the costs that arise from falling real wages alone. As such, the costs of inflation in the labor market are high even though real wages seem to have recovered fairly quickly after the post pandemic inflation (Lorenzoni and Werning, 2023*b*). The conflict costs of inflation remain large in various extensions—for instance when we allow households access to asset markets, or account for the determination of employment in general equilibrium.

Related literature. This paper contributes to the large literature on the costs of inflation. Previous work identifies inflation costs from a range of mechanisms, such as "shoe leather costs" of holding less money (e.g. Bailey, 1956; Friedman, 1969; İmrohoroğlu, 1992; Lucas, 2000); "menu costs" from changing prices and the associated price distortions (e.g. Burstein and Hellwig, 2008; Nakamura et al., 2018; Alvarez et al., 2019); tax distortions (e.g. Feldstein, Green and Sheshinski, 1978; Altig et al., Forthcoming); uncertainty due to volatile inflation (Friedman, 1977); cognitive costs due to complexity and difficulty in budgeting (Shiller 1997; Stantcheva 2024); and broader social and economic costs such as declining trust in government. Fischer and Modigliani (1978) review many of these costs in a unified framework. Binetti, Nuzzi and Stantcheva (2024) present survey evidence about which of these costs are perceived to be most important. Besides these other costs, we argue for significant "conflict costs" of inflation via the labor market.

A range of papers study how inflation leads to welfare costs in the labor market, by lowering real wages. Shiller (1997) and Stantcheva (2024) show using surveys that people dislike inflation in large part because they believe high inflation lowers real wages. Del Canto et al. (2023), Ferreira et al. (2023), and Pallotti et al. (2023) use a sufficient statistic approach to estimate the effect of inflationary shocks on welfare, taking into account amongst other channels the effect of inflation on real wages.[3] We argue that the behavior of real wages is an important but incomplete account of the costs of inflation that operate in the labor market. Rather, having nominal wages catch up with prices entails significant

[2]Alternatively, one could measure the conflict costs of inflation by calibrating our model to moments of the wage change distribution, analogous to the menu cost literature (e.g. Alvarez, Le Bihan and Lippi, 2016). However in our model, wage changes need not associate with conflict if firms partially index their wage offers to inflation. As a result, one requires hard-to-verify assumptions to map from the distribution of wage changes to conflict costs.

[3]Doepke and Schneider (2006) estimate the redistributional effect of inflation via asset markets, as opposed to labor markets. Auclert (2019) is a seminal application of the sufficient statistic approach to measuring the welfare effect of macroeconomic shocks.

additional welfare costs due to conflict.

In arguing that inflation leads workers to take costly actions, our paper relates to some previous evidence. Stantcheva (2024) provides key survey evidence about how inflation affects workers' behavior. The survey shows that workers believe firms have discretion over whether to grant higher nominal pay growth during times of inflation; while people react to inflation by taking costly actions such as searching for other jobs or asking for pay increases. Pilossoph and Ryngaert (2022) show that workers with higher inflation expectations are more likely to search for new jobs in order to secure nominal pay increases. Hajdini et al. (2023) show that workers who receive an information treatment about higher inflation are more likely to search for other jobs. Besides providing additional survey evidence consistent with these papers, we model the welfare effects of inflation due to these costly actions, and quantify the costs with our survey and model. In this way, our paper contributes to a broader agenda that fields surveys to generate qualitative and quantitative insights about macroeconomic phenomena (Stantcheva, 2023).

In contemporaneous work, Afrouzi et al. (2024) explain how job search affects the welfare cost of inflation for workers, based on a rich quantitative search model, disciplined by information on labor market flows. We instead model a range of costly actions via a reduced form "conflict cost," within a menu-cost style model, disciplined by a survey. Reassuringly, the two quite different approaches reach a similar conclusion—the effects of inflation due to costly actions by workers are large.

There is an empirical literature studying whether nominal wages catch up with inflation. An older literature found that aggregate nominal wages tended to catch up with inflation (Kessel and Alchian, 1960; Bach and Stephenson, 1974). Modern work such Blanco, Drenik and Zaratiegui (2024) emphasizes that wage catch up depends on factors such as the nature of the inflationary shock and especially workers' position in the wage distribution. Consistent with this view, poorer workers experienced stronger real wage growth during the post pandemic Inflation (Autor, Dube and McGrew, 2023). A common finding is that most workers experience at least some wage catch-up—motivating our model of *how* wages catch up with inflation.

Finally, Lorenzoni and Werning (2023*a*,*b*) study related themes concerning inflation and conflict. The aspect of conflict studied in these papers is disagreement between workers and firms over relative prices. In this way, conflict is a proximate cause of inflation dynamics. We study a related but different aspect of conflict: how inflation induces workers to take costly actions that put them in conflict with their employers in order to raise wages. Rather than investigate the cause of inflation, we ask how conflict affects the costs of inflation to workers.

2 Survey Design

Our main empirical results about conflict costs come from a survey that we ran between February and March 2024. We used Prolific, a survey marketplace that recruits respondents for research studies. We designed the survey to achieve three objectives. First, we elicited qualitative information on the way that wages were determined in 2023. Second, we used hypotheticals to test the key prediction of our framework, namely that conflict rises with inflation. Third, we designed questions to quantify conflict costs and the extent to which employers' default wage offers are indexed to inflation.

We collected a total of 2500 responses, with participation limited to individuals aged 22 to 60, employed either full-time or part-time, and not self-employed. We used an attention check to filter out careless participants.[4] We further imposed quotas, requiring a certain number of respondents within groups by gender, education and political affiliation. The quotas for gender and education targeted population shares from Current Population Survey (CPS) data for March 2023. The quota for political affiliation targeted data from Gallup 2024. Respondents were rewarded at an average rate of $1.40 for completing the survey, equivalent to $12 per hour.

Table B.1 compares our sample characteristics to the US population. Our sample broadly matches the demographic distribution of the US population, albeit with a higher representation of individuals in their thirties and a smaller proportion of respondents in their fifties. Additionally, our sample includes more educated participants, with a higher percentage of undergraduates and graduate degree holders and a lower percentage of individuals with a High School diploma/A-levels.

The survey consisted mostly of closed-ended questions. However, following best practices for "hybrid" open- and close-ended questions, we include an "Other" option in several questions throughout our survey (Stantcheva, 2023). This option allowed participants to express their thoughts in an open-ended fashion, enabling us to avoid imposing our preconceptions. Participants took an average of 7 minutes and 15 seconds to complete our survey. The full questionnaire is in Appendix E.

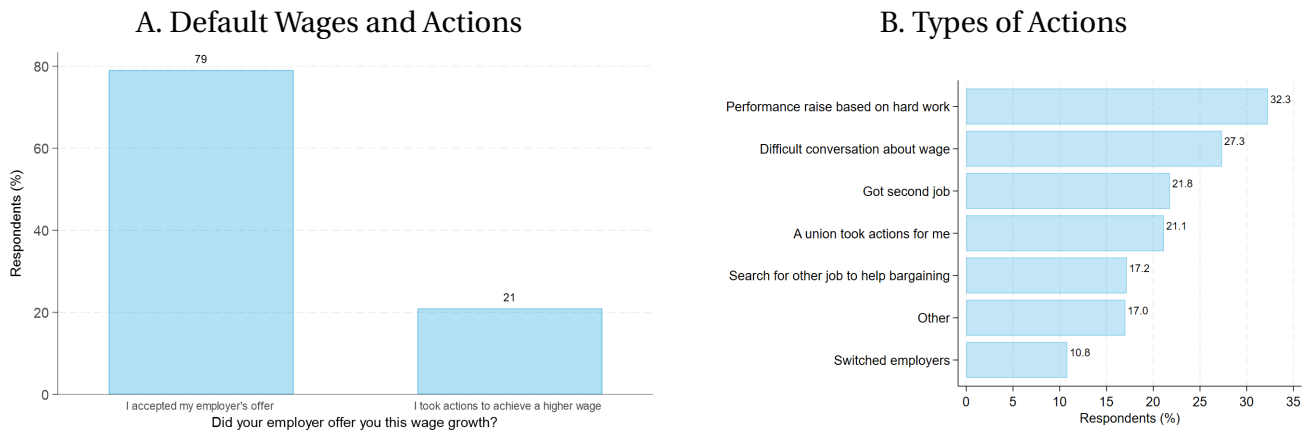
In the survey, we ask questions about "pay growth" and not "wage growth". In preliminary tests, we discovered that survey respondents found the "pay growth" language easier to understand. However, for consistency with the rest of the paper, we refer to "wage growth" as we describe our results.

3 Motivating Evidence: Wages, Inflation and Conflict

This section presents four findings relating conflict, wage growth, and inflation. Our first three findings establish the importance of conflict for wage setting. Our fourth finding investigates when work-

[4] Participants who failed the attention check were compensated for their participation and asked to return their submissions, allowing other respondents to take their place.

Figure 1: Default Wage Growth and Costly Actions



Panel A illustrates the percentage of survey participants who either accepted their employers' default wage offer or took action, either individually or through their unions, to achieve a higher wage during 2023. Panel B displays the percentage of survey participants who undertook costly actions to secure higher wage growth in 2023. Participants were asked to choose all actions that applied to them. Each bar in the figure corresponds to the following answer choices in order: "I worked longer hours or performed better at work to get a performance-based pay increase"; "I initiated a difficult conversation with my employer about my pay"; "I obtained a second job in addition to my main job"; "A union bargained for higher pay on my behalf"; "I searched for a higher-paying job with other employers to facilitate pay negotiations with my employer"; "Other, please add additional comments below"; and "I switched employers to get a raise."

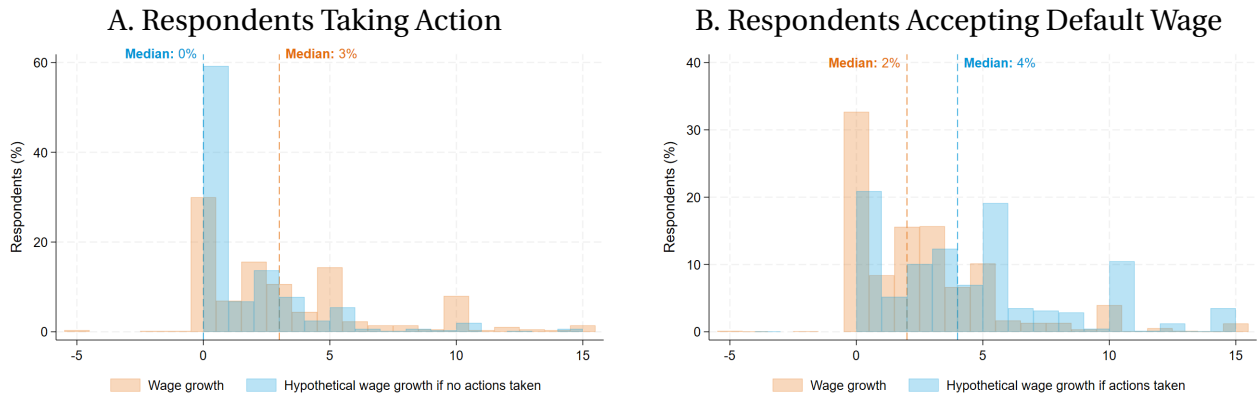
ers engage in conflict and shows that conflict rises with inflation.

Finding 1: Workers choose between accepting employer's "default wage" and engaging in conflict. Our survey shows that the employer's default wage offer is key for determining wage growth. After eliciting the respondent's wage growth in the previous year, we asked respondents whether they accepted a wage offered to them by their employers, or whether they took costly actions in order to secure this wage growth. The left panel of Figure 1 shows that 79% of workers accepted the wage offer made by their employer, while 21% of workers took actions to secure their wage growth. Appendix Figures B.1 and B.2 shows how the prevalence of conflict varies with observable characteristics of the worker. We find modest heterogeneity, with those who are younger, have higher incomes, or work in the government being slightly more likely to accept the default wage offers. The only group that was much less likely to have accepted the default wage offer were those in unionized sectors.

We then investigated which actions respondents took to in order to increase their pay.[5] Workers took a diverse set of actions, as the right panel of Figure 1 shows. Respondents were allowed to select all that apply. We see that 27% had difficult conversations with their employer, 17% secured an offer from another employer to raise pay with their current employer, and 21% had a union negotiate on their behalf. Together, 57% of respondents taking actions did one of these three, all of which place

[5]To answer this question without imposing preconceptions, we took two steps. First, in a pilot of 100 people, we asked respondents who took actions to explain them in open-ended form. Second, we grouped these actions into a set of categories, and asked the full survey to select actions from within these categories. We also allowed respondents to select an "other" option, and randomized the order of the categories.

Figure 2: The Effectiveness of Conflict



Note: Panel A and B depict the distribution of reported wage growth during 2023 and the hypothetical wage growth respondents reported they would have received if no actions had been taken or if actions had been taken to achieve a higher pay, respectively. The medians of both distributions are highlighted in each subfigure. The data range has been truncated, with values ranging from a minimum of -5% to a maximum of 15%. Panel A restricts to respondents who took actions to achieve a higher pay during 2023, asking the question "Above, you indicated that you got a pay raise by either initiating a difficult conversation with your employer about your pay, searching for a higher paying job with other employers or switching employers in order to get a raise." Panel B restricts to respondents who accepted their employers' default wage during 2023, asking the question "[w]hat pay growth do you think you could have attained this past year if you had taken actions such as initiating a difficult conversation with your employer to ask for a raise, searching for higher paying jobs with other employers, or switching employers in order to get a raise?".

them directly in conflict with their employer. Respondents also report taking other actions, namely working harder to secure a merit-based raise, switching jobs, or getting a second job.[6] While these actions per se do not involve direct conflict with the employer, they are nevertheless a costly reaction by the worker to increase wages beyond the employer's default wage offer.[7] This wide range of actions will motivate us to model conflict as a reduced from cost paid by the worker to secure a pay rise.

Finding 2: Conflict raises wages. Workers who engage in conflict believe these actions increase their wage growth. In blue in the left panel of Figure 2 , we plot the wage growth that these action takers report having received over the past year. We also asked respondents what wage growth they believe they would have received without taking actions, and plot this wage growth in orange. The distribution of hypothetical wage growth without actions is generally to the left of actual wage growth, with a median wage growth of 0% compared to a median wage growth with these actions of 3 percentage points.[8]

There is a similar pattern, both quantitatively and qualitatively, from directly comparing the wage growth for those workers in our survey who engaged in conflict in 2023 to those who did not. Those

[6]Working harder to secure a merit-based raise is somewhat different from the other actions—while clearly costly the worker, there might not be conflict with the firm. While merit-based raises were the most commonly reported action, only 11% of respondents reported that this was the only action taken to secure wage growth. Therefore, the prevalence of conflict is similar even if we ignore wage growth through merit based raises.

[7]Several recent papers model how during inflations, workers search for other jobs to raise their wage (Afrouzi et al., 2024; Pilossoph, Ryngaert and Wedewer, 2024). Our survey supports their finding that search is important. Our notion of conflict costs aims to capture a range of actions that workers can take to negotiate for higher wages.

[8]The left panel of Appendix Figure B.3 plots the difference in wage growth, with or without action, for each worker who takes costly actions to increase their pay. The average worker reported that costly actions raised their wage by 2%.

who conflicted experienced wage growth of 5.1% in 2023, compared to wage growth of 3.14% for those who accepted their employer's offer.

Finding 3: Workers who do not engage in conflict believe it would have raised their wages. We have seen that workers who engage in conflict believe it raises their wages. What about the workers who do not engage in conflict? One possibility is that workers do not engage in conflict because they believe conflict does not raise wages. Another possibility is that these workers dislike conflict, even though it might raise wages. The evidence suggests the latter. In the right panel of Figure 2, we plot the wage growth of people who did not take actions, as well as the wage growth they believe they would have received if they had taken actions. These workers believe that median pay would have been 2 percentage points higher if they had taken actions.[9] Evidently, workers perceive substantial costs associated with conflict, as they are willing to sacrifice significant wage growth to avoid taking action.[10]

Finding 4: Inflation leads to conflict. Our final finding considers when workers choose to engage in conflict. We present several pieces of evidence that suggests that inflation leads to conflict. First, we asked workers taking costly actions to report why they chose to take these actions in 2023.[11] The answers, in Figure 3, show that rising inflation was their main motivation, with 67% of the action takers reporting that they needed to combat a high cost of living. The next most important reason, that people deserved higher pay due to their performance, mattered for only 38% of respondents. Reassuringly, only 14% of respondents selected the "other" option. This result echoes a finding by Stantcheva (2024), who previously showed that workers take costly actions in order to raise wages after an inflation.

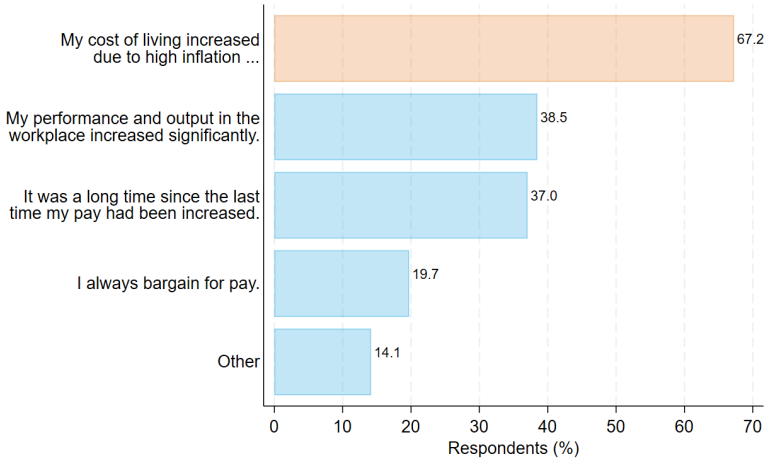
Second, we used a hypothetical question to explore whether workers are more likely to engage in conflict when inflation is high. We randomly assigned participants into five equally sized groups, each of which were offered a hypothetical scenario in which inflation was expected to be 2%, 4%, 6%, 8% or 10% over the next 12 months. We stipulated that other aspects of employment such as hours and firm would remain the same. We first asked respondents what wage they thought their

[9]The right panel of Appendix Figure B.3 plots the difference in wage growth, with or without action, for each worker who does not take take costly actions to increase their pay. The average worker who did not take costly actions believes they sacrificed 1.8 percent of wages by accepting the employer's offer.

[10]The qualitative responses explaining why workers chose to accept their employer's default wage offer also suggest that conflict is costly. Appendix Figure B.4 explores the reasons that people who accepted the wage offer made by their employer did not take further action. The most common reason to accept the offer is a lack of alternative job options, suggesting high costs to searching for another job in order to raise wages at the current job. The second most common reason is that negotiations are not allowed by the company. Overcoming a norm that wages cannot be negotiated is difficult, implying high conflict costs for this group.

[11]To do so, we again followed a procedure to avoid imposing preconceptions. We asked our pilot of 100 respondents to discuss in open-ended form why they took costly actions, and grouped their reasons into a set of categories that we presented to the full survey. Again, we allow respondents to select an "other" option, and randomized the order in which the categories were presented.

Figure 3: Motivation for Costly Actions in 2023



Note: The figure shows the percentage of survey participants who stated their motivations to take actions to achieve a higher pay during 2023, answering the question "[w]hat was your motivation for accepting your employer's default wage offer and not taking other actions to negotiate a higher pay raise?" Each bar in the figure represents the following answer choices in order: "My cost of living increased due to high inflation, therefore I needed more money to fund my spending and saving plans"; "My performance and output in the workplace increased significantly"; "It was a long time since the last time my pay had been increased"; "I always bargain for pay"; and "Other, please add additional comments below". The data includes only respondents who indicated that they, either individually or through their unions, took actions to achieve higher pay during 2023.

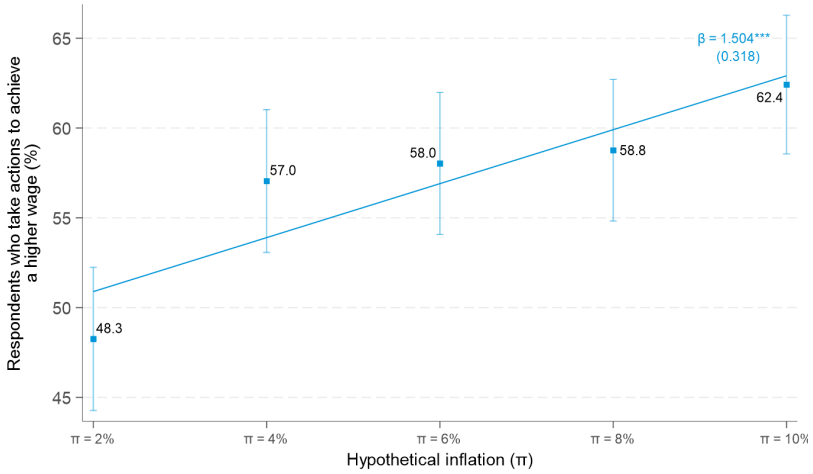
employer would offer them in that scenario. We then asked whether respondents would choose to take actions to achieve higher wages. Figure 4 shows the results. The y-axis shows the fraction of respondents who, when given a particular hypothetical scenario, say they would engage in conflict with their employer to achieve higher wages. The x-axis is hypothetical inflation under each scenario. When hypothetical inflation is 2%, less than half of respondents say they would take actions to achieve higher wage growth. However, when inflation is hypothetically 10%, more than 60% of respondents would conflict. The regression line indicates that for every percentage point increase in inflation, people believe they would be 1.5 percentage points more likely to take actions that put them in conflict with their employer.

Third, we find similar patterns in real-world data. Systematic data on conflict between workers and firms is typically hard to collect. One exception is unions, who publicly report when they choose to conflict with employers by going on strike. Consistent with our survey result, strikes rise significantly with inflation. Specifically, we estimate

$$\Delta \log \text{Strike}_{c,t} = \beta \Delta \pi_{c,t} + \gamma_c + \gamma_t + \varepsilon_{c,t} \tag{1}$$

where $\text{Strike}_{c,t}$ is the number of workers on strike in country c in year t, sourced from the International Labour Organization, and $\Delta \pi_{c,t}$ is the 5-year change in the rate of inflation in country c. γ_c and γ_t are country and year fixed effects, respectively. We include data on 78 countries from 1974-2022. We are interested in β, which captures relationship between the 5-year growth rate of the number of workers

Figure 4: Inflation and the Probability of Conflict



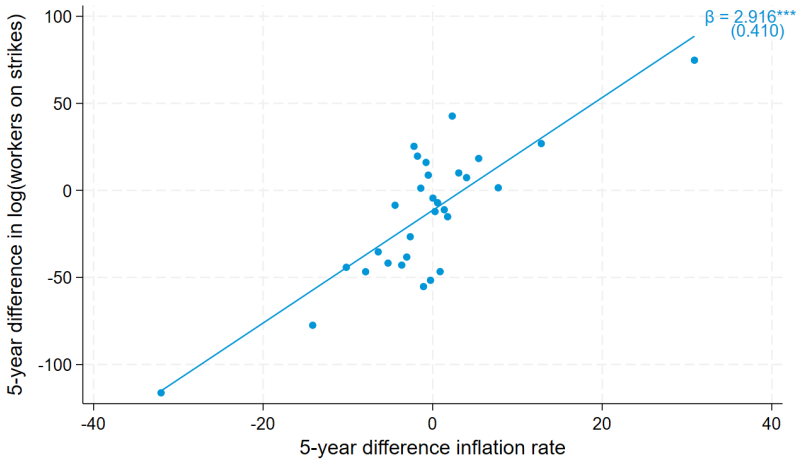
Note: This scatterplot displays the relationship between the indicator of whether respondents would take actions to secure a higher wages than the default wage growth, offered by their employers under a hypothetical inflation scenario, and the hypothetical inflation rate. The indicator is equal to one if respondents would take actions to secure a higher wage; otherwise zero. Standard errors are in brackets. The stars indicate levels of statistical significance: 1% (***), 5% (**), and 10% (*). The sample is all respondents. Respondents answered the following question. "Consider a hypothetical situation in which inflation is expected to be 2% in the next 12 months. Suppose that you are working at the same job at the same place you currently work, and working the same number of hours. Would you accept your employer's offer without taking any actions to increase your pay or would you do your best to increase your pay using any strategies at your disposal?"

on strike in a given country and the change in inflation in that country over the corresponding 5-year period. Figure 5 shows the binned scatterplot underlying the estimate of β in Equation (1), after controlling for fixed effects. There is a clear positive relationship – when inflation in a country rises by 10 percentage points over a 5-year period, the number of workers on strike increases by 23 percent. Appendix Table B.2 shows that this cross-sectional correlation is robust to various choices that define this specification, such as the time difference, measure of inflation, and sample period. While this relationship does not identify the causal effect of inflation on conflict, it is consistent with the premise that higher inflation leads to more conflict between workers and firms.

4 Model: Wage Erosion and the Conflict Costs of Inflation

We use a model to investigate how conflict affects the welfare costs of inflation. In the model, which is in partial equilibrium, workers receive a nominal wage offer from their employer that may not be fully indexed to inflation. Workers optimally choose whether to engage in costly conflict with employers in order to secure pay raises that keep up with inflation. We show that wage catch up through costly conflict does not raise welfare, because on the margin, worker optimality implies that the costs of conflict exactly cancel out the benefits of wage catch-up. The impact of inflation on workers' welfare is solely determined by the negative effect of wage erosion—how inflation would lower real wages if

Figure 5: Cross-country correlation between inflation and union strikes



Notes: This binned scatterplot illustrates the relationship between labor market strikes and inflation, based on the specification: $\Delta \log(\text{workers involved in strikes}) * 100_{i,t,t-5} = \beta \Delta \pi_{i,t,t-5} + \varepsilon_{it}$. The dependent variable is the 5-year log difference of "Workers involved in strikes and lockouts," sourced from the International Labour Organization, multiplied by 100 for ease of interpretation. We use headline inflation, sourced by the World Bank, trimmed at 2.5\% on each tail. Observations are unweighted, and standard errors are clustered at the country level. The analysis includes 78 countries spanning from 1969 to 2022. Data availability varies by year and country. The countries considered are described in Appendix Section \#\#. The coefficient of this relationship is displayed, with the standard errors enclosed in brackets. Stars denote levels of statistical significance: 1% (***), 5% (**), and 10% (*).

workers' conflict decisions did not respond to inflation. The behavior of real wages misses an important component of workers' welfare, namely the conflict costs that are required for wages to catch up with inflation.

4.1 The Worker's Problem

Time is discrete and indexed by $t \in \{0, 1, \cdots\}$. The economy is populated by a continuum of workers $i \in [0, 1]$. Each worker's preference is given by

$$\mathbb{E}\left[\sum_{t \geq 0} \beta^t \left(\log c_{i,t} - \kappa_{i,t} \mathscr{I}_{i,t}\right)\right], \tag{2}$$

where $c_{i,t}$ is worker's consumption, over which they have logarithmic utility.[12] $\mathscr{I}_{i,t}$ is an indicator function, which takes a value of one if the worker chooses to take costly actions that place them in conflict with their employer in order to increase pay. $\kappa_{i,t}$ is the utility cost to worker i of taking the costly action at time t. The conflict cost takes the "Calvo-plus" form of Nakamura and Steinsson

[12]The log utility case provides a clean benchmark because, in this case, conflict decisions are independent of the level of wages that a worker has.

(2010) and Auclert et al. (2024).[13] That is, with probability λ, conflict is not costly to the worker. With probably $1-\lambda$, the worker must exert a utility cost $\kappa > 0$ to increase pay, that is

$$\kappa_{i,t} = \begin{cases} \kappa & \text{with probability } 1-\lambda \\ 0 & \text{with probability } \lambda \end{cases}.$$

The cost $\kappa_{i,t}$ is i.i.d. over time and across workers.

Each worker i receives a real wage $w_{i,t} = \frac{W_{i,t}}{P_t}$, where $W_{i,t}$ is the nominal wage and P_t is the price level. If the worker does not take actions to increase pay $\left(\mathscr{I}_{i,t} = 0\right)$, they earn a default wage, which is $W^{\mathrm{d}}_{i,t} = W_{i,t-1}e^{\alpha+\gamma\pi_t}$ in nominal terms, or $w^{\mathrm{d}}_{i,t} = w_{i,t-1}e^{\alpha-(1-\gamma)\pi_t}$ in real terms. Here, α denotes the growth rate of the default nominal wage under zero inflation, $\gamma \in [0,1]$ is the degree of indexation to inflation shocks ($\gamma = 0$ is no indexation and $\gamma = 1$ is full indexation), and $\pi_t = \log\frac{P_t}{P_{t-1}}$ is the inflation rate.[14] If the worker takes actions to increase their pay $\left(\mathscr{I}_{i,t} = 1\right)$, they can raise it to an conflict-induced (real) wage $w^*_{i,t}$ that keeps up with inflation and productivity. That is, the worker $i's$ real wage is given by:

$$w_{i,t} = \begin{cases} w_{i,t-1}e^{\alpha-(1-\gamma)\pi_t} & \text{if } \mathscr{I}_{i,t} = 0 \\ w^*_{i,t} & \text{if } \mathscr{I}_{i,t} = 1 \end{cases}. \tag{3}$$

The conflict-induced real wage $w^*_{i,t}$ is exogenous and grows in line with productivity, meaning the conflict-induced nominal wage keeps up with prices. Therefore the conflict-induced real wage is

$$\log w^*_{i,t} = \log w^*_{i,t-1} + g_z + z_{i,t}, \tag{4}$$

where $z_{i,t}$ represents idiosyncratic productivity shocks and g_z represents trend productivity growth. The idiosyncratic shock has a mean of $\mathbb{E}\left[z_{i,t}\right] = 0$, is i.i.d. across workers and time, and has probability density function f.

In the main analysis, we study the case where the worker is hand-to-mouth and $c_{i,t} = w_{i,t}$. In extensions below, we also study the case that the worker faces a standard borrowing constraint and verify that our main conclusion stands.

To summarize the worker's problem conveniently, we introduce a "wage gap", defined as $x_{i,t} \equiv$

[13] We adopt "Calvo-plus" costs for simplicity, however versions of our main results will hold with general menu costs as in Alvarez, Lippi and Oskolkov (2022).

[14] Our model is flexible enough to accommodate different degrees of indexation to inflation shocks (parametrized by γ) and steady-state inflation (parameterized by α).

$\log w_{i,t} - \log w^*_{i,t}$. Based on equation (3), we can write the dynamics of the wage gap as

$$x_{i,t} = \begin{cases} x_{i,t-1} - \left(\mu + z_{i,t}\right) - \left(1-\gamma\right)\left(\pi_t - \pi^{ss}\right) & \text{if } \mathscr{I}_{i,t} = 0 \\ 0 & \text{if } \mathscr{I}_{i,t} = 1 \end{cases}, \tag{5}$$

where $\mu \equiv g_z - \alpha + \left(1-\gamma\right)\pi^{ss} \geq 0$ parametrizes the drift of the wage gap in steady state.

We make an auxiliary assumption about the support of idiosyncratic shock: $f\left(z_{i,t}\right) \geq 0$ for $z_{i,t} \in \left[-\overline{z}, \overline{z}\right]$ and $f\left(z_{i,t}\right) = 0$ otherwise, where $\overline{z} \in \left[0, \mu\right]$. This assumption guarantees that, with probability one, $w_{i,t} \leq w^*_{i,t}$, so that the steady state distribution of wage gaps has a non-positive support. This assumption ensures that if the worker takes action to conflict with the employer, pay will always increase.

Our model captures features of wage setting from the survey evidence of Section 2. Workers choose between a default wage offered to them by the employer, or instead taking costly actions to increase pay. These costs include initiating a difficult conversation with the employer, searching for higher-paying jobs to negotiate higher pay at the current job, switching to a higher paid job, or partaking in industrial action. Since there is a diverse range of actions, we model their costs with a single reduced form parameter κ, representing time and monetary costs, as well as psychological costs from dispute with employers. The actions ensure a wage $w^*_{i,t}$ that reflects both inflation and productivity growth. In the absence of these actions, workers receive a default wage offered by the employer that may not be fully indexed to inflation shocks, if $\gamma < 1$. In other words, the default contract between workers and employers is potentially incomplete (Grossman and Hart, 1986; Hart and Moore, 1990). The degree of incompleteness is indexed by a single parameter γ, which we will later discipline with data.

In this setup, we have assumed that firms respond to inflation shocks through indexing their wage offer (γ) and by responding to workers when they engage in conflict. While firms themselves do not pay the conflict costs, they do pay workers more when workers take costly actions. Alternative, more sophisticated, wage setting policies could have firms setting wages to prevent conflict entirely. For instance, firms could always offer wages that are just high enough that workers do not choose to engage in conflict, in essence marking wages down by exactly the worker's conflict cost. However, this more sophisticated wage setting is not consistent with several features of our survey. First, this more sophisticated policy means that default wage offers are fully indexed to inflation, as the firm must continue to keep workers exactly indifferent to conflict when inflation rises. Second, with the sophisticated policy, we would not observe conflict in equilibrium. Neither prediction is supported by our survey. Given these findings, we choose to summarize the behavior of the firm with the degree of indexation γ to inflation shocks, which we will measure in the data.

Our model takes place in partial equilibrium, which allows us to focus on the worker's problem. As such, the real rate of return on savings, r, and the conflict-induced real wage, $w^*_{i,t}$, are exogenous. Moreover, workers are always employed in our setup regardless of their wage (we have assumed that the distribution of wage gaps has non-positive support, meaning firms also have no incentives to fire the worker). These assumptions will be relaxed in the general equilibrium model of Section 6. By studying the partial equilibrium problem, we can isolate the effects of inflation shocks on worker welfare, regardless of the underlying source of the inflation movements (e.g., driven by aggregate demand shocks or aggregate supply shocks).

Our model is also similar to the standard, state-dependent menu cost model of price setting (e.g. Alvarez, Le Bihan and Lippi, 2016).[15] However, we apply the model to wage setting instead. As such, our model can be usefully contrasted to common time-dependent models of wage setting (e.g. Erceg, Henderson and Levin, 2000).[16] Time-dependent models impose a fixed probability that workers' wages optimally reset, and do not allow the timing of wage adjustment to be affected by conflict. Our model includes time dependence as a special case as $\lambda > 0$ and the conflict cost κ becomes infinitely large.

4.2 The Impact of Inflation Shocks on Worker Welfare and Wages

The economy starts from a steady state with inflation $\pi^{ss} \geq 0$. An unexpected aggregate shock to the path of inflation, $\{\hat{\pi}_t\}_{t=0}^{+\infty} \equiv \{\pi_t - \pi^{ss}\}_{t=0}^{+\infty}$ is realized at the beginning of period 0. The economy does not face other aggregate shocks. We are interested in characterizing how the inflation shock affects workers' welfare and wages. Specifically, workers' aggregate welfare and wages are defined as

$$\mathcal{W} \equiv \int_0^1 \mathbb{E}\left[\sum_{t=0}^{\infty} \beta^t \left\{u\left(c_{i,t}\right) - \kappa_{i,t}\mathcal{I}_{i,t}\right\}\right] di \quad \text{and} \quad \log w_t \equiv \int_0^1 \log\left(w_{i,t}\right) di, \tag{6}$$

where $\mathbb{E}$ averages over the realization of idiosyncratic shocks (after the realization of the aggregate shock). The impact of the inflation shocks on workers' welfare and wages is denoted by $\hat{\mathcal{W}} \equiv \mathcal{W} - \mathcal{W}^{ss}$ and $\{\hat{w}_t\}_{t=0}^{\infty} \equiv \{\log w_t - \log w^{ss}\}_{t=0}^{\infty}$.

To characterize the responses, we first derive the rule characterizing the worker's optimal choice over whether to engage in conflict with their employer. Specifically, we can rewrite the utility of worker

[15] One key difference between our model and the menu cost model is that, in the menu cost model, the firm's objective depends on a quadratic loss based on the gap between the current price and the optimal reset price, while in our model, the worker's objective depends on a linear loss based on the gap between the current wage and the conflict-induced wage.

[16] Another key difference from Erceg, Henderson and Levin (2000) is that they focus on the intensive margin of labor supply adjustment, while we focus on the extensive margin. Because of this difference, in Erceg, Henderson and Levin (2000) workers ask for a lower wage to increase pay (because the elasticity of labor demand is greater than 1). This feature of the model is counterfactual.

i in equation (2) as a function of wage gaps, conflict decisions, and an exogenous constant that is invariant to decisions and the path of inflation:

$$\mathbb{E}\left[\sum_{t\geq 0}\beta^t\left[\log\left(w^*_{i,t}e^{x_{i,t}}\right)-\kappa_{i,t}\mathscr{I}_{i,t}\right]\right]=\mathbb{E}\left[\sum_{t\geq 0}\beta^t\left[x_{i,t}-\kappa_{i,t}\mathscr{I}_{i,t}\right]\right]+\underbrace{\mathbb{E}\left[\sum_{t\geq 0}\beta^t u\left(w^*_{i,t}\right)\right]}_{\text{Exogenous}}. \tag{7}$$

Worker i's problem can then be summarized by:

$$\max_{\{\mathscr{I}_{i,t}\}_{t=0}^{\infty}}\mathbb{E}\left[\sum_{t\geq 0}\beta^t\left[x_{i,t}-\kappa_{i,t}\mathscr{I}_{i,t}\right]\right]\quad\text{s.t.}\quad(5). \tag{8}$$

In each period t, a worker faces two options. First, the worker can choose conflict with the employer ($\mathscr{I}_{i,t}=1$), increasing pay and eliminating the wage gap ($x_{i,t}=0$). Second, the worker can refrain from taking costly actions $\left(\mathscr{I}_{i,t}=0\right)$ and allow the wage to adjust according the employer's default wage offer, $x_{i,t}=x_{i,t-1}-\left(\mu+z_{i,t}\right)-\left(1-\gamma\right)\hat{\pi}_t$. The worker's optimal choice can be characterized by a threshold rule. For example, at steady state, we have $\mathscr{I}^{ss}_{i,t}=1$ if $x<\underline{x}^{ss}$ and $\mathscr{I}^{ss}_{i,t}=0$ if $x\geq\underline{x}^{ss}$, where $\underline{x}^{ss}$ is the value of x such that the worker is indifferent between conflict with employers and accepting the default wage.[17]

First, we provide a simple illustration. In the model, inflation raises the fraction of workers engaging in conflict, consistent with the real world and survey evidence of Finding 4 above. We define $\text{frac}_t=\int_0^1\mathbb{E}\left[\mathscr{I}_{i,t}\right]di$ as the share of workers who conflict with the employer at each time t.

Proposition 1. *If $\gamma<1$, then an increase in inflation at $t=0$ leads to a larger fraction of workers engaging in conflict at $t=0$, so that $\partial frac_0/\partial\pi_0>0$.*

The intuition for this result is straightforward. Suppose that inflation increases. As long as default wages are not fully indexed to inflation ($\gamma<1$), workers receive greater real wage cuts absent conflict. As workers' nominal wages lag further behind prices, more workers are pushed over their conflict threshold and choose conflict. If default wage offers are fully indexed to inflation ($\gamma=1$), then real wages do not fall, meaning that workers' incentives do not change as inflation rises. This result occurs because wage setting is state dependent in the model. Alternatively, if wage setting were time dependent—a special case of our model with $\kappa\to\infty$ and $\lambda>0$—then conflict would not change with inflation. However, our motivating evidence of Finding 4 favors the state dependent model.

We now turn to the impact of inflation on aggregate worker welfare and how it connects with the responses of aggregate wages. We first decompose the response of aggregate wages to inflation shocks

[17] Away from steady state, there exist thresholds $\{\underline{x}_t\}_{t=0}^{+\infty}$ such that the worker's optimal choices in (8) are given by $\mathscr{I}_{i,t}=1$ if $x<\underline{x}_t$ and $\mathscr{I}_{i,t}=0$ if $x\geq\underline{x}_t$.

into two terms:

$$\hat{w}_t = \hat{w}_t^{\text{erosion}} + \hat{w}_t^{\text{catch up}}.$$

The first term, which we call *wage erosion*, is the impact of inflation on real wages while holding each worker's conflict decision $\{\mathscr{I}_{i,t}\}_{t=0}^{+\infty}$ as if the aggregate inflation were fixed at the steady state level. The second term, which we call *wage catch-up*, captures wage adjustment to inflation arising from the impact of the inflation shocks on each worker's conflict decision.

Formally, let $\omega_t\left(\boldsymbol{\pi}_t, \mathscr{I}_{\boldsymbol{i,t}}, h_{i,t}\right)$ denote worker i's real wage at time t for a given path of inflation $\boldsymbol{\pi}_t = \{\pi_\tau\}_{\tau=0}^t$, conflict choices $\mathscr{I}_{\boldsymbol{i,t}} = \{\mathscr{I}_{i,\tau}\}_{\tau=0}^t$, and history of idiosyncratic conditions $h_{i,t} \equiv \left(\{z_{i,\tau}, \kappa_{i,\tau}\}_{\tau=0}^t, w_{i,-1}\right)$. Wage erosion measures how aggregate real wages would change, holding conflict decisions fixed at their steady state value, that is:

$$\hat{w}_t^{\text{erosion}} \equiv \int_0^1 \log\left(\omega_t\left(\boldsymbol{\pi}_t, \mathscr{I}_{\boldsymbol{i,t}}^{\boldsymbol{ss}}, h_{i,t}\right)\right) di - \int_0^1 \log\left(\omega_t\left(\boldsymbol{\pi}^{\boldsymbol{ss}}, \mathscr{I}_{\boldsymbol{i,t}}^{\boldsymbol{ss}}, h_{i,t}\right)\right) di. \tag{9}$$

Here, $\mathscr{I}_{i,t}^{ss}$ is what conflict decisions would have been, given steady-state inflation, as well as the same history of idiosyncratic shocks. Wage catch-up is the component of wage adjustment that results from changes in conflict choices due to the inflation shock:

$$\hat{w}_t^{\text{catch up}} \equiv \int_0^1 \log\left(\omega_t\left(\boldsymbol{\pi}_t, \mathscr{I}_{\boldsymbol{i,t}}, h_{i,t}\right)\right) di - \int_0^1 \log\left(\omega_t\left(\boldsymbol{\pi}_t, \mathscr{I}_{\boldsymbol{i,t}}^{\boldsymbol{ss}}, h_{i,t}\right)\right) di. \tag{10}$$

Now, we can examine the impact of inflation on aggregate worker welfare. From (6), we can decompose the response of worker welfare to the inflation shock into two components:

$$\hat{\mathscr{W}} = \underbrace{\sum_{t=0}^{\infty} \beta^t \hat{w}_t}_{\text{aggregate wage responses}} - \underbrace{\hat{\varkappa}}_{\text{conflict costs}}, \tag{11}$$

where the first term captures the effect of inflation on the present value of aggregate wages, and the second term

$$\hat{\varkappa} \equiv \int_0^1 \mathbb{E}\left[\sum_{t=0}^{\infty} \beta^t \kappa_{i,t}\left(\mathscr{I}_{i,t} - \mathscr{I}_{i,t}^{ss}\right)\right] di = \kappa \sum_{t=0}^{\infty} \beta^t \left(\text{frac}_t - \text{frac}_t^{ss}\right)$$

captures how the inflation shock changes the total utility costs borne by workers from engaging in conflict with their employers. The second term is equal to the utility cost per conflict multiplied by how inflation changes the share of workers who engage in conflict, as studied in Proposition (1). We now connect the two components of the welfare change to the two components of wage adjustment, and in doing so, present the main analytical result of the paper.

Theorem 1. *The first order impact of inflation shocks $\{\hat{\pi}_t\}_{t=0}^{\infty}$ on aggregate worker welfare is given solely*

by wage erosion, whereby

$$\hat{\mathscr{W}} \approx \sum_{t=0}^{\infty} \beta^t \hat{w}_t^{erosion} = \underbrace{\sum_{t=0}^{\infty} \beta^t \hat{w}_t}_{\text{real wage responses}} \underbrace{- \sum_{t=0}^{+\infty} \beta^t \hat{w}_t^{catch\ up}}_{\text{catch up}}, \tag{12}$$

because the benefits of wage catch-ups to inflation shocks to worker welfare are offset by the associated conflict costs:

$$\hat{\varkappa} \approx \sum_{t=0}^{\infty} \beta^t \hat{w}_t^{catch\ up}. \tag{13}$$

Equation (12) shows that the response of workers' welfare to the inflation shock depends only on wage erosion. The benefits of wage catch-up equal the conflicts associated with the wage catch-up, meaning catch-up is irrelevant for worker welfare. To illustrate, consider a sequence of positive inflation shocks $\hat{\pi}_t \geq 0$ for all t. These shocks erode real wages, captured by the negative wage erosion term $\hat{w}_t^{\text{erosion}}$, and negatively impact worker welfare. As in Proposition 1, inflation shocks lead more workers to engage in conflict to raise their wages, resulting in positive wage catch-up $\hat{w}_t^{\text{catch up}}$. Due to worker optimality, the workers pushed over the conflict threshold by the inflation shock and who switch into conflicts are marginal. Their benefits from the wage catch-up are equal to the conflict costs to a first order, which explains equation (13). Our results use the envelope theorem in Milgrom and Segal (2002), which applies to discrete choices, i.e., workers' optimal choices of whether to conflict with employers $\{\mathscr{I}_{i,t}\}_{t=0}^{\infty}$. As explained in detail in the proof, this envelope theorem holds almost surely at the worker level (everywhere except the point where the worker is indifferent between accepting the default wage offer and conflicting with employers to raise pay) and everywhere at the aggregate level.

As such, the impact of inflation on worker welfare, which depends only on wage erosion, and its impact on real wage, which also includes catch-up through costly conflict, can be quite different. Even if the aggregate wage catches up with inflation, meaning that the impact of inflation shocks on the aggregate real wage $\sum_{t=0}^{\infty} \beta^t \hat{w}_t$ is close to zero, inflation could still harm worker welfare. Much of the welfare gains of wage growth could be offset by the costly actions that were needed to secure that wage growth. As a result, the extent to which aggregate wages catch up with prices during an inflationary episode does not measure worker welfare.

Finally, it is worth contrasting our model with time-dependent models of wage setting. This case is nested in our model with $\lambda > 0$ and $\kappa \to \infty$. Theorem 1 still holds. In that case, all wage catch-up come from costless, exogenous Calvo adjustment opportunities so conflict costs κ are always zero.[18]

[18] Both $\hat{\varkappa}$ and $\left\{\hat{w}_t^{\text{catch up}}\right\}_{t=0}^{\infty}$ are zero, the later comes from the definition in equation (10) and the fact $\mathscr{I}_{i,t} = \mathscr{I}_{i,t}^{ss}$ for all i and t. That is, $\mathscr{I}_{i,t} = 1$ when and only when exogenous Calvo adjustment opportunities arrive.

As a result, the impact of inflation shocks on the aggregate real wage $\sum_{t=0}^{\infty}\beta^t\hat{w}_t$ is sufficient to capture the impact of inflation on worker welfare.

What determines the magnitude of wage erosion, and as such the impact of inflation on worker welfare? The following Proposition links wage erosion to two objects: first, the indexation of the default wage; and second the probability that the employer's default wage offer "survives" for s periods without conflict (Φ_s). Rigorously, $\Phi_s \equiv \int_0^1 \left(\Pi_{k=0}^{s}\left(1-\mathscr{I}_{i,t+k}^{ss}\right)\right)di$ is defined as the fraction of workers who never engage in conflict with the employer to raise pay during the period $t,\ t+1,\cdots,\ t+s$ for any $t\geq 0$ at steady-state inflation. For example, consider the time-dependent case ($\lambda>0$ and $\kappa\to\infty$), where $\mathscr{I}_{i,t+k}^{ss}=1$ only when the costless wage adjustment opportunities with probability λ. In this case, the survival probability is $\Phi_s=(1-\lambda)^s$.

Proposition 2. *To a first order, wage erosion and the impact of inflation on worker welfare is given by*

$$\hat{w}_t^{erosion}\approx-\left(1-\gamma\right)\sum_{s=0}^{t}\Phi_{t-s}\hat{\pi}_s\quad\forall\, t\geq 0\quad \textit{and}\quad \hat{\mathscr{W}}\approx-\left(1-\gamma\right)\sum_{s=0}^{\infty}\sum_{k=0}^{\infty}\beta^{s+k}\Phi_k\hat{\pi}_s. \tag{14}$$

From (14), the impact of the inflation shock $\hat{\pi}_s$ on worker welfare is given by $-\left(1-\gamma\right)\sum_{k=0}^{\infty}\beta^{s+k}\Phi_k\hat{\pi}_s$, the sum of how much inflation erodes real wages for each period after the shock. Wage erosion in turn depends on the degree of indexation γ and the "survival" probability of the employer's default wage offer.

Proposition 2 provides a perspective on the two objects determining how conflict impacts the welfare costs of inflation . First, a higher conflict cost κ increases the magnitude of wage erosion and raises welfare costs of inflation, by raising the survival probability of the employer's default wage offer $\{\Phi_s\}$. Second, a lower degree of indexation γ does the same by letting an inflation shock decrease the employer's default real wage offer more. In the coming section, we will discipline both objects with survey evidence.

4.3 Extensions

We now consider various extensions of the baseline model. The core result—that the impact of inflation on workers' welfare is determined by wage erosion and not by real wage growth—continue to apply.

Allowing other aggregate shocks. In the main analysis, we study the case in which the only aggregate shocks are inflation shocks. Our main result, Theorem 1, can be extended to the case with other aggregate shocks (e.g., TFP shocks, allowing productivity growth $g_{z,t}$ to be time varying). As elaborated in Appendix C, the impact of inflation $\{\hat{\pi}_t\}_{t=0}^{+\infty}$ on aggregate worker welfare is now given by

$$\hat{\mathscr{W}} = \sum_{t=0}^{\infty} \beta^t \left(\hat{w}_t^{\text{erosion}} + \underbrace{\frac{1}{1-\beta} \hat{g}_{z,s}}_{\text{direct impact of TFP shocks}} \right),$$

where deviations from their steady-state values, still denoted by hats, are driven by both inflation and TFP shocks. Wage erosion now arises from both inflation and aggregate TFP shocks and is given by

$$\hat{w}_t^{\text{erosion}} \approx -\left(1-\gamma\right) \sum_{s=0}^{t} \Phi_{t-s} \hat{\pi}_s - \sum_{s=0}^{t} \left(1-\gamma^z\right) \Phi_{t-s} \hat{g}_{z,s} \quad \forall t \geq 0, \tag{15}$$

where γ^z captures the degree of indexation of default wages to TFP shocks and $\hat{g}_{z,t} \equiv g_{z,t} - g_z^{ss}$. This extension clarifies that the impact of inflation shocks on worker welfare does not depend on the underlying source of inflation shocks. Regardless of whether $\{\hat{\pi}_s\}$ comes from TFP shocks $\{\hat{g}_{z,s}\}$ or demand shocks independent of $\{\hat{g}_{z,s}\}$,the extent to which inflation shocks lead to wage erosion (the first term in (15)) and impact worker welfare remains the same. TFP shocks also impact worker welfare through additional channels.

Beyond hand to mouth consumers. In the main analysis, we study the case in which the worker has log utility and is hand-to-mouth. Our main result, Theorem 1, can be extended to the case where the worker faces a standard borrowing constraint and/or does not have log utility. As elaborated in Appendix C, the impact of inflation $\{\hat{\pi}_t\}_{t=0}^{+\infty}$ on aggregate worker welfare is now given by

$$\hat{\mathscr{W}} \approx \sum_{t=0}^{\infty} \beta^t \int_0^1 u'\left(c_{i,t}^{ss}\right) w_{i,t}^{ss} \hat{w}_{i,t}^{\text{erosion}} di, \tag{16}$$

where $\hat{w}_{i,t}^{\text{erosion}} \equiv \log\left(\omega_t\left(\boldsymbol{\pi}_t, \mathscr{I}_{i,t}^{ss}, h_{i,t}\right)\right) - \log\left(\omega_t\left(\boldsymbol{\pi}^{ss}, \mathscr{I}_{i,t}^{ss}, h_{i,t}\right)\right)$. Compared to (12), the only difference is that different workers' wage erosion may receive different weights $\frac{u'\left(c_{i,t}^{ss}\right) w_{i,t}^{ss}}{\int_0^1 u'\left(c_{i,t}^{ss}\right) w_{i,t}^{ss} di}$. The envelope theorem logic, where the benefits of wage catch-up to inflation shocks on worker welfare are offset by the costs from more frequent conflicts, remains true.

Allowing unemployment. In the main analysis, we study the case in which workers are always employed. Our main result, Theorem 1, can be extended to the case allowing unemployment, and inflation can impact worker welfare also through its impact on employment rates (i.e., inflation greases the wheel of the labor market and increases employment rates), as in the general equilibrium analysis of Section 6. As elaborated in Appendix C, the envelope theorem logic still holds, and the impact of inflation $\{\hat{\pi}_t\}_{t=0}^{+\infty}$ on aggregate worker welfare is now given by

$$d\mathcal{W} = \sum_{t=0}^{\infty} \beta^t \left[E_t \cdot \hat{w}_t^{\text{erosion}} - \log(\phi) \cdot \hat{E}_t \right],$$

where E_t captures the fraction of workers employed at period t, $\hat{E}_t = E_t - E^{ss}$ captures its deviation from its steady state value, and ϕ captures the unemployment benefits (as a fraction of workers' steady state real wages).

5 Measuring Conflict Costs of Inflation

As we have discussed, two factors determine how conflict affects the costs of inflation: first, how much workers dislike taking actions to get higher pay (i.e., how costly conflict is); second, the degree of indexation of employers' default wage offers. We use our survey to directly measure these two factors. The survey suggests that workers are willing to sacrifice a significant portion of their wages to avoid conflict, and default wage offers are not fully indexed to inflation. Therefore the conflict channel is important for determining the welfare costs of inflation to workers. Our survey measures also discipline key parameters in our model that help us quantify the conflict costs of inflation in the next section.

5.1 Eliciting Costs of Engaging in Conflict

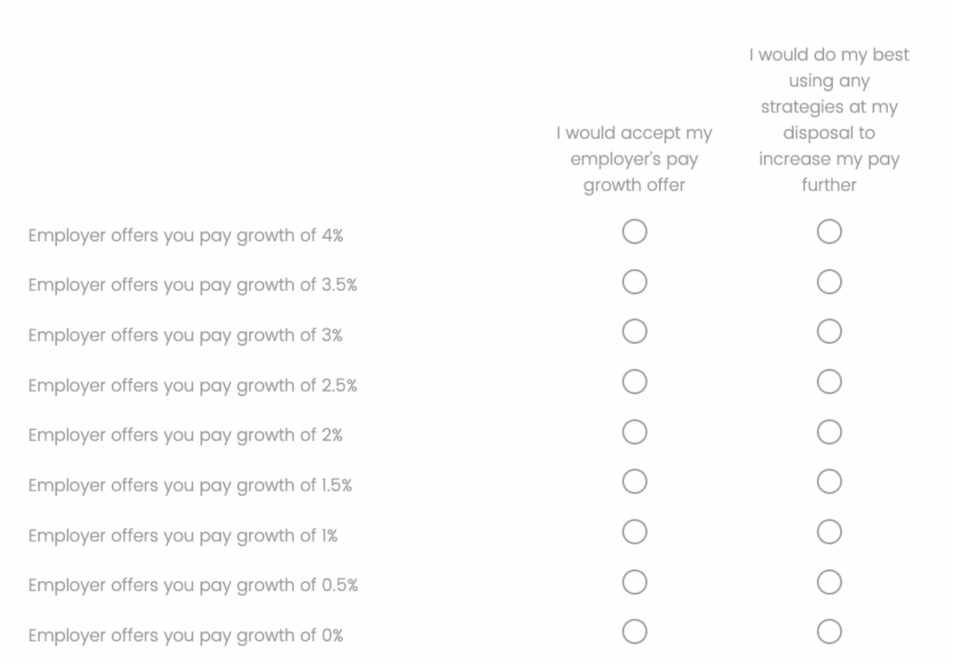
We first measure what fraction of their wages workers would sacrifice to avoid conflict with their employers. We take two steps. First, we elicit wage growth workers believe they could secure from their employer if they took costly actions to increase pay. Second, we elicit the default wage growth that workers are indifferent between accepting if offered by employers versus choosing conflict. The difference between these two wages measures the cost of conflict as a fraction of wages.

To elicit wage growth induced by conflict, we ask respondents to think ahead 12 months, while holding fixed their current work place, employer, job and working hours. We ask the worker what nominal wage growth they think they could achieve if they used any strategies at their disposal, $\Delta W^{\text{conflict}}$.

We then elicit the default nominal wage growth for which workers are indifferent between accepting their employer's offer versus choosing conflict, ΔW^{indiff}. The fraction of the wage that workers would sacrifice to avoid conflict is then $x^{\text{conflict}} = \Delta W^{\text{conflict}} - \Delta W^{\text{indiff}}$.

To elicit ΔW^{indiff}, we adapt the standard "multiple price lists for willingness to pay elicitation" used in experimental economics (e.g., Jack, McDermott and Sautmann, 2022). Based on the reported conflict-induced nominal wage growth $\Delta W^{\text{conflict}}$, we constructed a menu of nominal wage growth

Figure 6: Survey Question to Elicit Indifference Wage



Notes: this figure contains the question from the survey eliciting the indifference wage. For each pay growth offered by the employer, respondents are required to choose whether they would accept the offer or take costly actions to increase pay. Respondents first answer a question that reveals their conflict induced wage: "[c]ommon strategies to increase pay include initiating a difficult conversation about pay with employers, or searching for higher paid jobs with other employers. Please, think ahead to 12 months from now. Suppose that you are working at the same job at the same place you currently work, and working the same number of hours. What pay growth do you think you would get if you do your best to increase pay using any strategies at your disposal, including the common strategies listed above?". In order to elicit indifference wage growth, respondents then answer the question "[y]our employer increases pay for everyone in your position, including you, by z% (possible values listed below). Would you accept your employer's offer without taking any actions to increase your pay or would you do your best to increase your pay using any strategies at your disposal (such as initiating a difficult conversation about pay with employers, or searching for higher paid jobs with other employers)? Remember that you have said that if you do your best to increase pay using any strategies at your disposal, you would have a pay growth of X%." Here, X is their answer to the previous question.

options where the maximum nominal wage growth is $\Delta W^{\text{conflict}}$ and the minimum is $\Delta W^{\text{conflict}}$ minus 4 percentage points, with a gradient of 0.5 percentage points. Figure 6 shows this menu, for an example in which the respondent reported an conflict-induced wage growth $\Delta W^{\text{conflict}} = 4\%$. For each hypothetical wage growth in the menu, we asked participants whether they would accept the offer or take actions to achieve a higher pay.[19] In the top row, employers offer wage growth equal to the conflict induced wage. If conflict is costly, workers should always accept this wage. In the bottom row, employers offer far less wage growth than the conflict induced wage, meaning workers should choose conflict unless the costs are prohibitively high. At some intermediate wage growth hypothetically offered by the employer, workers should switch between accepting and conflicting. The switching wage growth bounds the worker's indifference wage growth (ΔW^{indiff}) within a 0.5% interval. Specifically, letting $\Delta W^{\text{accept}} \in \left[\Delta W^{\text{indiff}} - 0.5\%,\ \Delta W^{\text{indiff}}\right]$ denote the lowest nominal wage growth where workers

[19] We randomized whether the menu was ascending or descending, and whether accepting or conflicting is ordered first, which means that the average results are unaffected by any anchoring due to page location. Fortunately, we find that the cost of conflict is the same across groups, meaning order is not important.

accept the employers' offer, we can find

$$x^{\text{conflict}} \in \left[\Delta W^{\text{conflict}} - \Delta W^{\text{accept}},\ \Delta W^{\text{conflict}} - \Delta W^{\text{accept}} + 0.5\%\right].$$

We set x^{conflict} at the median of the interval. For those those who would take costly actions at all default wage offers, we assign x^{conflict} of less than 0.25%. For those who would never take actions that put them in conflict with their employer, we assume that x^{conflict} is higher than 4%.[20]

Figure 7 illustrates the full distribution of x^{conflict} in our sample. These conflict costs are large and heterogeneous. The median worker would sacrifice 1.75% of their wages in order to avoid taking costly actions that put them in conflict with their employer. There is large dispersion around this median value of x^{conflict}, with more than 15% of the sample being willing to sacrifice at least 4 percent of their wages to avoid conflict. While there is substantial dispersion in conflict costs, we do not find much systematic heterogeneity across worker demographics or income. As a result, the cost of conflict that is residualized for worker observable characteristics is very similar to the overall distribution (See Appendix Figures B.1 and B.5).[21,22]

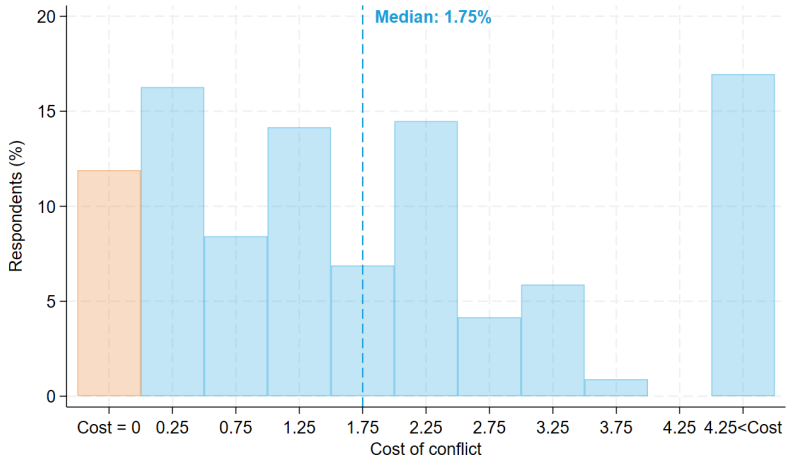
Our measure of conflict costs are derived from hypotheticals, but reassuringly, the cross sectional variation is consistent with respondents' self reported actions in 2023. First, we show that respondents with higher conflict costs were less likely engage in conflict. We see this in the left panel of Figure 8, where there is a strong negative relationship between the probability that the respondent took actions in 2023 on the y-axis and their elicited cost of conflict on the x-axis — those with a cost of conflict in the top quintile were 1.5 times less likely to have taken actions that put them in conflict with their employer than those who had a cost of conflict in the bottom quintile. Second, we further find that there is a tight link between the costs of conflict, actions taken, and the size of the workers' perceived wage gaps in 2023. Specifically, the right panel of Figure 8 restricts to those workers who did not engage in conflict in 2023 and relates their elicited cost of conflict to the wage gain that those workers think they could have achieved if they had taken action (i.e. the data displayed in the right panel of Figure 2). The positive relationship is exactly what we expect – the workers who did not take action in 2023 even when those actions would have resulted in large wage gains are precisely those who had large costs of conflict. Conversely, the workers who did not choose to take actions despite low conflict costs are precisely those who did not stand to gain as much from those actions. Together, these cross-

[20] The only group of respondents that we exclude from Figure 7 are those who give non-monotone responses, which fortunately is less than 7% of the sample.

[21] To assess magnitudes, one useful comparison is union dues, which approximate how much workers pay to avoid direct conflict with employers. Union dues are generally between 1-2% of wages per year. For example, dues for the Service Employees International Union (health care, 1.9 million members) were 1.7%, and United Auto Workers (auto manufacturing, 1 million members) were approximately 1.1%.

[22] Figure 2 reports related information on the wage increase that workers, who did not conflict in 2023, would hypothetically receive with conflict. This information bounds, but does not point identify, each worker's conflict cost.

Figure 7: Distribution of Conflict Costs Elicited from Survey



Note: this figure illustrates the distribution of the cost of conflict (x^{conflict}), showing the percentage of participants with each discrete value. x^{conflict} is defined as the difference between the wage growth participants would receive if they take actions to increase their pay ($\Delta W^{\text{conflict}}$) and their indifference wage (ΔW^{indiff}), which is defined as the minimum wage growth participants would be willing to accept if offered by their employers. The data is limited to respondents who bargain first and then accept the offer. We also include respondents who always and never take actions to achieve a higher pay with a x^{conflict} of less than zero and more than 4, respectively. The median cost of conflict, considering all individuals except participants who always bargain and thus have a cost of zero, is highlighted in the figure.

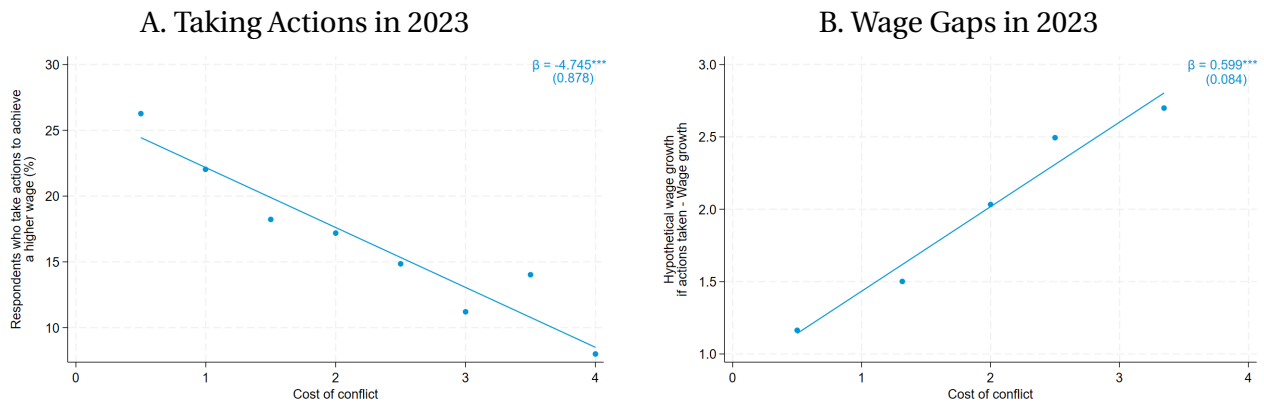
sectional patterns show consistent answers across sections of the survey and increase our confidence that the elicited conflict costs predict worker behavior.

5.2 Default Nominal Wage Growth and Inflation

The framework in Section 4 shows that the conflict costs of inflation depend on whether the default wage indexes with inflation. This object is hard to measure in real-world data, since one cannot easily distinguish between conflict-induced wage growth versus default wage growth offered by an employer. Instead, we elicit the degree of indexation of default wage offers to inflation shocks using survey hypotheticals. Similar to Section 3, we randomly assign participants into a hypothetical scenario in which inflation is expected to be 2%, 4%, 6%, 8% or 10% over the next 12 months. We then asked survey respondents what nominal wage growth employers would offer them in that setting (i.e. the "default" nominal wage growth).

Figure 9 shows that workers perceive that employers would offer almost the same default nominal wage growth at all levels of inflation. The y-axis is default wage growth that workers expect their employer to offer in the absence of any actions on their part. The x-axis is hypothetical inflation proposed to the respondent. For reference, we also plot the 45 degree line, which would reflect fully indexed wages. The blue circles plot the mean default wage growth expected by the respondents in the scenario that was posed to them. The regression line, with shaded 95% confidence intervals, has a

Figure 8: Validating Elicited Conflict Costs



Note: Panel A of this figure shows the relationship between the cost of conflict (x^{conflict}) and an indicator for whether the respondent took actions to achieve wage growth in 2023. x^{conflict} is defined as the difference between the wage growth participants would receive if they take actions to increase their pay ($\Delta W^{\text{conflict}}$) and their indifference wage (ΔW^{indiff}), which is defined as the minimum wage growth participants would be willing to accept if offered by their employers. The data is limited to respondents who bargain first and then accept the offer. The coefficient of this relationship is displayed, with the standard errors enclosed in brackets. Stars denote levels of statistical significance: 1% (***), 5% (**), and 10% (*). The binned scatterplot in Panel B shows the the relationship between the cost of conflict (x^{conflict}) and the difference between the wage respondents think they could have gotten if they had taken action and the wage growth they received in 2023. The sample is restricted to respondents who accepted their employers' default wage during 2023.

slope of 0.054, but is not statistically different from zero. Therefore, workers believe that a 1 percentage point increase in inflation leads to a 0.054 percentage point increase in employers' default wage offers, absent conflict.[23]

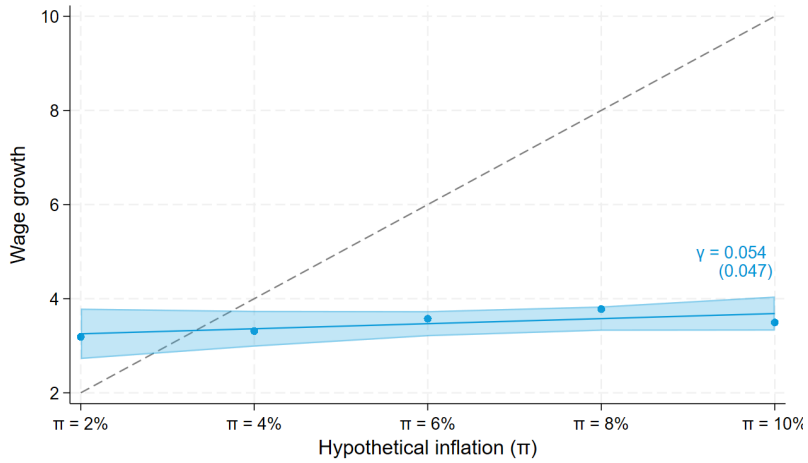
5.3 Mapping Survey Evidence to Model

Our survey findings suggest that the effect of inflation due to conflict is large. If workers choose to conflict, they must pay large costs of 1.75% of wages. If workers do not conflict, they suffer large real wage falls after an inflation shock, because the default wage barely changes in nominal terms. We can use these these two key survey objects to calibrate the key parameters of the model. The model lets us map from the survey objects to a measure of worker welfare, in order to evaluate the costs of specific inflationary episodes.

In terms of calibrating specific objects, our measure x^{conflict}, the percent of wages that workers would sacrifice to avoid conflict, directly maps to the threshold (default) wage gap $x^{\text{conflict}} = -\underline{x}^{ss}$. As discussed in Section 4, with a (default) wage gap of $\underline{x}^{ss} < 0$, the worker is indifferent between conflicting and accepting the default wage offer. In other words, $-\underline{x}^{ss}$ captures the percentage of wages that workers would sacrifice to avoid conflict in the model, exactly mapping to x^{conflict} in the survey. In particular, we use the median conflict cost to pin down the threshold wage gap $\underline{x}^{\text{ss}} = -1.75$ in the

[23] We find similar results when relating the default wage offer that workers think their employer will offer them next year to what they expect inflation will be next year (Appendix Figure B.6).

Figure 9: Default Nominal Wage Growth and Inflation



Note: This binned scatterplot depicts the relationship between the default wage growth respondents reported they would receive under a hypothetical inflation scenario and the hypothetical inflation rate, along with the 95\% confidence interval of the predicted relationship . The gray dashed line serves as a reference 45-degree line. The coefficient of this relationship is displayed, with the standard errors enclosed in brackets. The stars indicate levels of statistical significance: 1% (***), 5% (**), and 10% (*). The sample is all respondents. Respondents answered the following question. "Consider a hypothetical situation in which inflation is expected to be 2% in the next 12 months. Suppose that you are working at the same job at the same place you currently work, and working the same number of hours. What pay growth do you think you would get by default if you do not take any strategies at your disposal to increase your pay (such as initiating a difficult conversation about pay with employers, or searching for higher paid jobs with other employers)?"

model. We then further use $\underline{x}^{ss}$ to pin down the utility cost of worker engaging in conflict, κ.[24]

Furthermore, 11% of workers always conflict (the leftmost orange bar in Figure 7) and perceive that conflict is costless, which maps to $\lambda = 0.11$ in our model, i.e., the frequency of costless, exogenous opportunities for wage catch-up. Finally, we calibrate γ the extent to which default wage growth indexes to inflation. We calibrate $\gamma = 0.05$ based on the slope of the regression line in Figure 9, i.e. a small degree of indexation of the default wage. We do acknowledge that this regression captures the extent of perceived default wage indexation, which could be lower than actual default wage indexation. So we will also explore robustness to higher levels of γ.

Our survey measure elicits workers' costs of engaging in conflict directly. One could infer these conflict costs indirectly, by calibrating a model to match moments of the wage growth distribution as in the menu cost literature (e.g., Alvarez, Le Bihan and Lippi, 2016). In our model, wage changes need not associate with conflict and can come from growth in the default wage offered by employers. Without hard-to-verify assumptions, one cannot differentiate conflict-induced wage changes from default wage changes in the wage data, nor map the distribution of wage changes to conflict costs.

[24]Specifically, let $v_t(x)$ denote the worker's value given its wage gap at the end of period t in (8). That is, $v_t(x) \equiv \max_{\{\mathscr{I}_{i,t+k}\}_{k=1}^{\infty}} x + \mathbb{E}_t\left[\sum_{k\geq 0}\beta^{t+k}\left[x_{i,t+k} - \kappa_{i,t+k}\mathscr{I}_{i,t+k}\right]\right]$, subject to (5) and $x_{i,t} = x$. One can then find κ from the steady-state value function $v^{ss}(x)$ and $v^{ss}(0) - \kappa = v^{ss}\left(\underline{x}^{ss}\right)$.

Table 1: Main Analysis—Calibration

Parameter	*Description*	*Value*	*Target*
β	Discount factor	0.99	Standard
κ	Conflict cost	6.06%	Survey, such that $\underline{x}^{ss} = -1.75\%$
λ	Share of free adjusters	11%	Survey
g_z	Trend productivity growth	0.50%	2% annual growth
α	Default nominal wage growth, zero inflation	0.75%	Survey
γ	Indexation of default nominal wage	0.05	Survey
π^{ss}	Steady state inflation	0.5%	2% annual inflation
$\overline{z}$	Idios. shocks $z_{i,t} \sim U[-\bar{z}, \bar{z}]$	0.23%	Steady state wage gaps non-positive

6 Quantifying the Conflict Costs of Inflation

In this section, we analyze the quantitative implications of the model developed in Section 4 and calibrated in Section 5. The aim is to quantitatively assess the importance of conflict in determining the costs of inflation to workers. We find that the costs of inflation, considering conflict costs, are significantly larger than the costs of falling real wages alone.

6.1 Calibration

We calibrate the model of Section 4 at a quarterly frequency, as Table 1 summarizes. As we discussed above, we use our survey to measure the costs of conflicts ($\lambda = 0.11$ and $\kappa = 6.06\%$ such that $\underline{x}^{ss} = -1.75\%$) and the degree of indexation of the default wage ($\gamma = 0.05$). For the quarterly calibration, we set the discount factor to a standard value $\beta = 0.99$. The trend productivity growth rate $g_z = 0.5\%$ is chosen to map a steady-state average annual growth rate of real wages of 2%, a standard value. We assume $\pi^{ss} = 0.5\%$, implying a steady-state annual inflation of 2%, again a standard value. We find $\alpha = 0.75\%$, the growth of the default nominal wage at zero inflation, from our survey based on hypothetical inflationary scenarios. Specifically, α maps to the intercept of Figure 9, i.e., the growth rate of default nominal wages if inflation is zero. Finally, we assume that idiosyncratic productivity shock $z_{i,t}$ follows a uniform distribution with a mean of 0 and support $[-\bar{z}, \bar{z}]$, where $\bar{z} = \mu = g_z - \alpha + (1-\gamma)\pi^{ss} = 0.23\%$. This value of $\overline{z}$ maximizes the variance of idiosyncratic shocks given the constraint that the steady state distribution of wage gaps has a non-positive support. As we discussed, we require that steady state gaps are non-positive so that in steady state, workers pay always increases if they choose to engage in conflict.

6.2 Conflict, Wage Erosion and the Impact of Inflationary Shocks

We use the calibrated model to quantify the welfare costs of inflationary shocks to workers. The main finding is that, due to conflict, total welfare costs are significantly larger than the costs of falling real wages alone. We solve the first-order impact of inflation shocks $\{\hat{\pi}_t\}_{t=0}^{+\infty}$ using Sequence-space Jacobian methods, developed in Auclert et al. (2021) and Auclert et al. (2024). This approach allows us to analyze the welfare consequences of an arbitrary path of inflation.

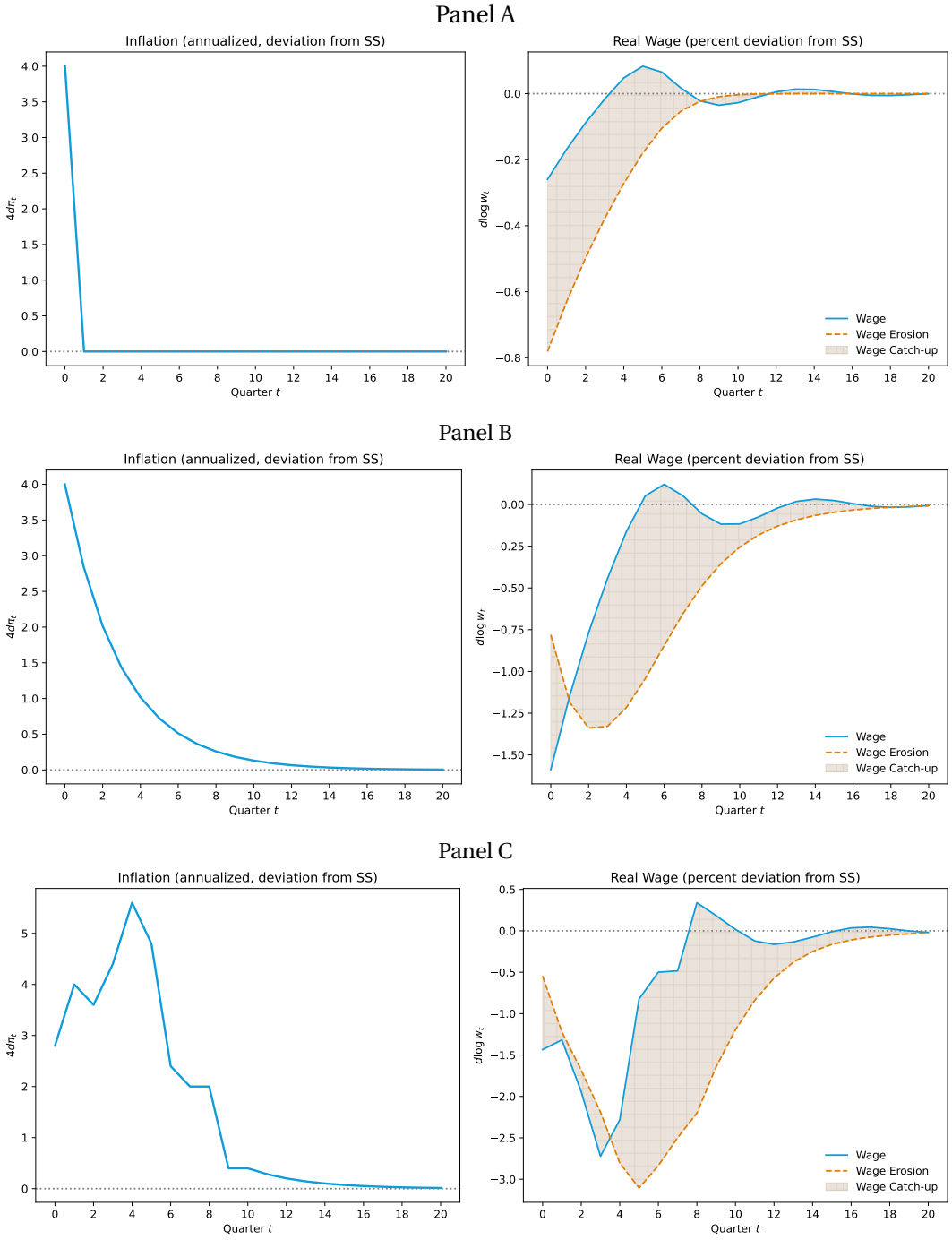
We evaluate three inflationary scenarios. The first scenario is transitory inflation shocks (Figure 10, Panel A), $\hat{\pi}_0 = 1\%$ and $\hat{\pi}_t = 0$ for $t \geq 1$. The second scenario is persistent inflation shocks (Figure 10, Panel B), $\hat{\pi}_t = \rho^t$ with $\rho = 0.71$, which matches the empirical autocorrelation of inflation in the US time series. The third scenario is the actual path of inflation between January 2021 and December 2023 (Figure 10, Panel C), based on the difference between quarterly headline Personal Consumption Expenditures Inflation and 2%. Following December 2023, we assume that inflation converges back to steady state at a rate of $\rho = 0.71$. The path of inflation in each scenario can be seen from the left panel of each corresponding figure. In the main analysis, as in Section 4, an unexpected aggregate inflation shock is realized at $t = 0$,and workers have perfect foresight about the path of inflation afterwards. In Appendix D, we show that removing the foresight assumption does not affect the main implications of our analysis.

The right panel of each corresponding figure shows the dynamic response of real wages and welfare under each scenario. In all cases, the overall welfare costs of inflation, measured by wage erosion, are significantly greater than the effect of inflation through lowering real wages. For each scenario, the full blue line displays the overall real wage response $\{\hat{w}_t\}_{t=0}^{+\infty}$. The dashed orange line displays the resulting wage erosion $\left\{\hat{w}_t^{\text{erosion}}\right\}_{t=0}^{+\infty}$. The shaded region is the difference between the two, measuring wage catch-up due to changing conflict decisions $\left\{\hat{w}_t^{\text{catch up}}\right\}_{t=0}^{+\infty}$.[25] Overall, the gap between real wages and wage erosion is large. Put differently, nominal wages partly catch up with inflation, so that real wages fall little. However, this masks a substantially larger fall in the welfare relevant wage erosion term, meaning that a substantial fraction of the wage growth was achieved through costly conflict. For example, for a purely transitory inflation shock, real wages fall by only 0.25% on impact, though welfare as measured by wage erosion falls by 0.8%. Conflicts costs are a major part of the overall costs of inflation to workers.

Table 2 confirms the importance of conflict for the overall welfare costs of inflation. The table displays the welfare costs of inflation to workers and decomposes them into real wage responses and conflict costs according to equation (12). In the table, welfare units are denoted in terms of percent of

[25] The overall real wage response $\{\hat{w}_t\}_{t=0}^{+\infty}$ can be positive in response to positive inflationary shocks. The reason is that positive inflation shocks lead to more conflict and nominal wage increases, which helps workers' wages catch up not only with inflation shocks but also with steady state inflation.

Figure 10: Real Wage Dynamics after Inflation Shocks



Notes: each panel plots the response to a given inflation scenario. In Panel A, there is a transitory shock to inflation lasting one quarter. In Panel B, there is a persistent shock, that decays at quarterly rate $\rho = 0.71$. In Panel C, the path of inflation matches headline quarterly PCE inflation over 2021-3. In the left figure of each panel, we plot the path of inflation, annualized, after subtracting a steady state inflation of 2%. In the right panel we plot the percent deviation of the real wage from steady state in the solid blue line. We plot the welfare effect of the inflationary shock in dashed orange, which is wage erosion. The gap between the two lines, shaded in grey, is wage catchup, which is associated with conflict costs.

Table 2: Welfare Decomposition

	Overall Welfare Change	*Real Wage Response*	*Conflict costs*
Transitory inflation	−0.73%	−0.10%	−0.63%
Persistent inflation	−2.46%	−1.06%	−1.39%
2021-2023 inflation	−5.85%	−2.84%	−3.01%

Notes: the first column shows the overall decline in welfare after a transitory inflation shock (column 1), persistent inflation shock (column 2) or the 2021-3 inflation (column 3) as a percent of annual consumption in the first year. The second column shows the response of real wages in each scenario, again as a percent of annual consumption in the first year. The final column shows the response of conflict costs, expressed in units of real wages.

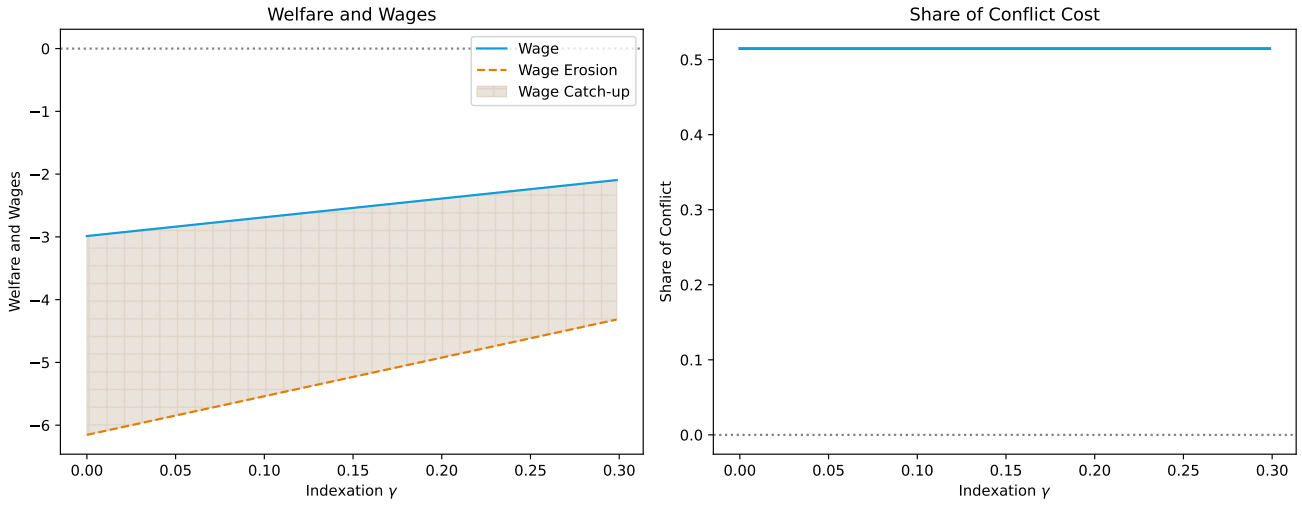
annual consumption in the first year. For all inflationary scenarios, we find that the costs of inflation to workers, considering conflict costs, are at least twice as large as the costs that arise from falling real wages alone. For example, for the 2021-23 inflation surge, the overall welfare costs of inflation for workers are 5.85%. Conflict costs are 3.01%, constituting more than half of the total costs.

One natural question is how indexation of the default wage affects our results. In the baseline analysis, we calibrate a default wage that does not vary much with inflation ($\gamma = 0.05$), based on the estimates of Section 5.2. If we instead allow the default wage to be partially indexed, then the costs of inflation via conflict fall. The reason is that real wages fall less absent conflict. As a result, workers choose to conflict less often. However, even with moderate indexation, the costs of conflict remain large. We show this result in the left panel of Figure 11. In the panel, we plot the decline in the present value of wages (blue solid line), and the wage erosion term (dashed orange line, which also captures welfare costs of inflation) as the degree of indexation γ varies between 0 and 0.3. Even with moderately high indexation of 0.3, the welfare costs of inflation from the wage erosion term remain high. Moreover, even though the overall costs of inflation fall as indexation increases, conflict costs still constitute a significant proportion of the costs of inflation. The right panel shows this result. The ratio of conflict costs to the overall costs of inflation remains around 0.5, even as the degree of indexation varies. Indeed, as we prove formally in Appendix C, this does not depend on the indexation parameter. A higher degree of indexation lowers the magnitudes of wage erosion and wage catch-up proportionally.

7 Conclusion

Why do people dislike inflation so much? One reason could be that prices rise faster than nominal wages, motivating the study of how quickly wages catch up with prices. In this paper, we have argued

Figure 11: Costs of Conflict as Indexation Varies



Notes: the left panel calculates the present value of the decline in real wages for the 2021-2023 inflation, in solid blue; and the value of wage erosion, in dashed orange. The value of both varies as the indexation parameter varies between 0 and 0.3. The right panel plots the ratio of these two terms as the indexation parameter varies.

that it is equally important to understand *how* nominal wages catch up with prices. Our survey evidence suggests that firms do not just give workers raises as prices go up. Workers have to fight for them by taking actions that place them in conflict with their employers. We find that workers dislike conflict, which becomes more frequent as inflation rises. Our model and quantitative exercises suggest that accounting for these conflict costs doubles the costs of inflation relative to considering the path of real wages alone.

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Appendix (For Online Publication)

Joao Guerreiro Jonathon Hazell Chen Lian Christina Patterson

A Proofs

Proof of Proposition 1 At time 0, the inflation shock is fully unanticipated. This means that, at $t = 0$, workers' wage gaps before the conflict decisions $\{\tilde{x}_{i,0}\}_{i\in[0,1]}$ are distributed with probability density function $g_0(\tilde{x}) = g^{ss}\left(\tilde{x} + (1-\gamma)\hat{\pi}_0\right)$ where $\tilde{x} \in \left[\underline{x}^{ss} - \mu - \overline{z} - (1-\gamma)\hat{\pi}_0, -(1-\gamma)\hat{\pi}_0\right]$ and g^{ss} is the steady state probability density function of wage gaps before the conflict decisions $\left\{\tilde{x}^{ss}_{i,\cdot}\right\}_{i\in[0,1]}$. Worker's optimal conflict decision at $t = 0$ as a function of $\tilde{x}_{i,0}$ is given by

$$\mathscr{I}_{i,0} = \begin{cases} 1 & \tilde{x}_{i,0} < \underline{x}_0 \\ 0 & \tilde{x}_{i,0} \geq \underline{x}_0 \end{cases}.$$

As a result,

$$\text{frac}_0 = \lambda + (1-\lambda)\left\{1 - \int_{\underline{x}_0}^{-(1-\gamma)\hat{\pi}_0} g^{ss}\left(x + (1-\gamma)\hat{\pi}_0\right) dx\right\},$$

and

$$\left.\frac{\partial \text{frac}_0}{\partial \hat{\pi}_0}\right|_{\{\pi_t = \pi^{ss}\}_{t=0}^{\infty}} = (1-\gamma)(1-\lambda)\, g^{ss}\left(\underline{x}^{ss}\right) > 0,$$

where we use the fact that $\underline{x}_0$ is a function of $\{\hat{\pi}_t\}_{t=1}^{\infty}$ but not $\hat{\pi}_0$.

Proof of Theorem 1 Define worker i's expected utility as a function of inflation path $\boldsymbol{\pi}_\infty$ and initial wage $w_{i,-1}$

$$\mathscr{U}\left(\boldsymbol{\pi}_\infty, w_{i,-1}\right) = \max_{\{\mathscr{I}_{i,t}(h_{i,t})\}_{t=0}^{\infty}} \mathbb{E}\left[\sum_{t=0}^{\infty} \beta^t \left[\log\left(\omega_t\left(\boldsymbol{\pi_t}, \boldsymbol{\mathscr{I}_{i,t}}, h_{i,t}\right)\right) - \kappa_t \mathscr{I}_{i,t}\left(h_{i,t}\right)\right]\right], \tag{A.1}$$

where $\boldsymbol{\pi_t} = \{\pi_\tau\}_{\tau=0}^{t}$, $h_{i,t} \equiv \left(\left\{z_{i,\tau}, \kappa_{i,\tau}\right\}_{\tau=0}^{t}, w_{i,-1}\right)$, and $\boldsymbol{\mathscr{I}_{i,t}} = \left\{\mathscr{I}_{i,\tau}\left(h_{i,\tau}\right)\right\}_{\tau=0}^{t}$ capture the history of inflation, idiosyncratic conditions, and conflict decisions up to t, and $\mathbb{E}$ averages over the realization of idiosyncratic shocks $\left\{z_{i,\tau}, \kappa_{i,\tau}\right\}_{\tau=0}^{\infty}$. Let $\mathscr{I}^*_{i,\tau}\left(h_{i,\tau}; \boldsymbol{\pi}_\infty\right)$ denote the optimally chosen conflict decision for each individual history as a function of the inflation path π_∞ that solves (A.1) and $\boldsymbol{\mathscr{I}^*_{i,t}} = \left\{\mathscr{I}^*_{i,\tau}\left(h_{i,\tau}; \boldsymbol{\pi}_\infty\right)\right\}_{\tau=0}^{t}$ the corresponding individual history up to t. Applying the Envelope Theorem

from Milgrom and Segal (2002),[26] we know that, for all $s \geq 0$,

$$\frac{\partial \mathscr{U}\left(\boldsymbol{\pi}_{\infty}, w_{i,-1}\right)}{\partial \pi_s} = \mathbb{E}\left[\sum_{t=0}^{\infty} \beta^t \frac{\partial \log\left(\omega_t\left(\boldsymbol{\pi}_{\boldsymbol{t}}, \mathscr{I}^*_{\boldsymbol{i},\boldsymbol{t}}, h_{i,t}\right)\right)}{\partial \pi_s}\right] \quad \text{a.s.}$$

Notice that, for all $\left(\boldsymbol{\pi}_{\boldsymbol{t}}, \mathscr{I}_{\boldsymbol{i},\boldsymbol{t}}, h_{i,t}\right)$,

$$\frac{\partial \log\left(\omega_t\left(\boldsymbol{\pi}_{\boldsymbol{t}}, \mathscr{I}_{\boldsymbol{i},\boldsymbol{t}}, h_{i,t}\right)\right)}{\partial \pi_s} = \begin{cases} 0 & \text{if } t < s \\ -\left(1-\gamma\right)\prod_{\tau=s}^{t}\left(1-\mathscr{I}_{i,\tau}\left(h_{i,\tau}\right)\right) & \text{if } t \geq s \end{cases}. \tag{A.2}$$

As a result, for all $s \geq 0$,

$$\frac{\partial \mathscr{U}\left(\boldsymbol{\pi}_{\infty}, w_{i,-1}\right)}{\partial \pi_s} = -\left(1-\gamma\right)\sum_{t=s}^{\infty}\beta^t \mathbb{E}\left[\prod_{\tau=s}^{t}\left(1-\mathscr{I}^*_{i,\tau}\left(h_{i,t};\boldsymbol{\pi}_{\infty}\right)\right)\right] \quad \text{a.s.} \tag{A.3}$$

The sufficient condition to apply the Envelope Theorem in Milgrom and Segal (2002) is that $\frac{\partial \log(\omega_t(\boldsymbol{\pi}_{\boldsymbol{t}}, \mathscr{I}_{\boldsymbol{i},\boldsymbol{t}}, h_{i,t}))}{\partial \pi_s}$ is uniformly upper bounded by some Lebesgue integrable function. This is indeed true here as $\prod_{\tau=s}^{t}\left(1-\mathscr{I}_{i,\tau}\left(h_{i,t}\right)\right)$ is constrained to lie between 0 and 1, so that the absolute value of $\frac{\partial \log(\omega_t(\boldsymbol{\pi}_{\boldsymbol{t}}, \mathscr{I}_{\boldsymbol{i},\boldsymbol{t}}, h_{i,t}))}{\partial \pi_s}$ is uniformly upper bounded by $\frac{\beta(1-\gamma)}{1-\beta}$. The aggregate worker welfare in (6) is given by $\mathscr{W}\left(\boldsymbol{\pi}_{\infty}\right) = \int_0^1 \mathscr{U}\left(\boldsymbol{\pi}_{\infty}, w_{i,-1}\right) di$.

From (A.3), we have

$$\frac{\partial \mathscr{W}\left(\boldsymbol{\pi}^{\boldsymbol{ss}}\right)}{\partial \pi_s} = -\left(1-\gamma\right)\sum_{t=s}^{\infty}\beta^t \int_0^1 \mathbb{E}\left[\prod_{\tau=s}^{t}\left(1-\mathscr{I}^*_{i,\tau}\left(h_{i,t};\boldsymbol{\pi}^{ss}\right)\right)\right] di$$

From the definition of $\hat{w}_t^{\text{erosion}}$ in (9) and (A.2), we know that, for $s \in \{0, \cdots, t\}$,

$$\hat{w}_t^{\text{erosion}} = -\left(1-\gamma\right)\sum_{s=0}^{t}\left(\int_0^1 \mathbb{E}\left[\prod_{\tau=s}^{t}\left(1-\mathscr{I}^*_{i,\tau}\left(h_{i,t};\boldsymbol{\pi}^{ss}\right)\right)\right] di\right)\cdot \hat{\pi}_s, \tag{A.4}$$

As a result, to a first order,

$$\hat{\mathscr{W}} \approx \sum_{t=0}^{\infty}\beta^t \hat{w}_t^{\text{erosion}},$$

where we use Proposition (2). The rest of the Proposition directly follows from $\hat{w}_t = \hat{w}_t^{\text{erosion}} + \hat{w}_t^{\text{catch up}}$ and (11).

[26] Milgrom and Segal (2002) allows the application of the theorem to settings with infinite discrete choices, in this case conflict decision for each individual history $\{\mathscr{I}_{i,t}\left(h_{i,t}\right)\}_{t=0}^{\infty}$.

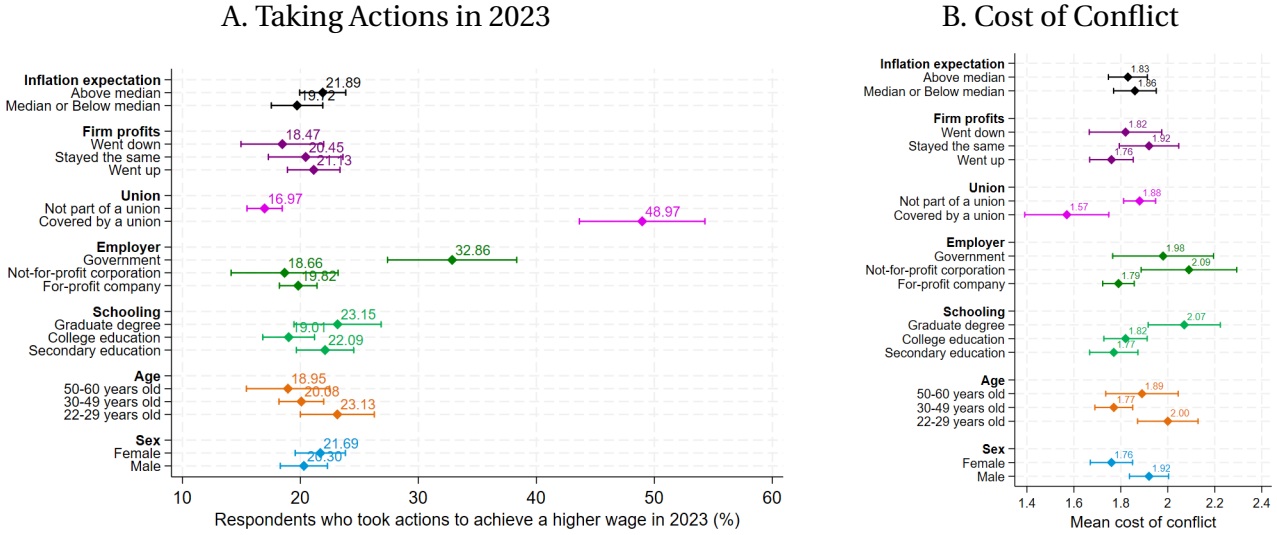
Proof of Proposition 2 From the definition of Φ in the main text, we know that, for $s \leq t$,

$$\Phi_{t-s} = \int_0^1 \mathbb{E}\left[\prod_{\tau=s}^{t}\left(1 - \mathscr{I}^*_{i,\tau}\left(h_{i,t}; \boldsymbol{\pi}^{ss}\right)\right)\right] di.$$

Proposition (2) then follows directly from (A.4).

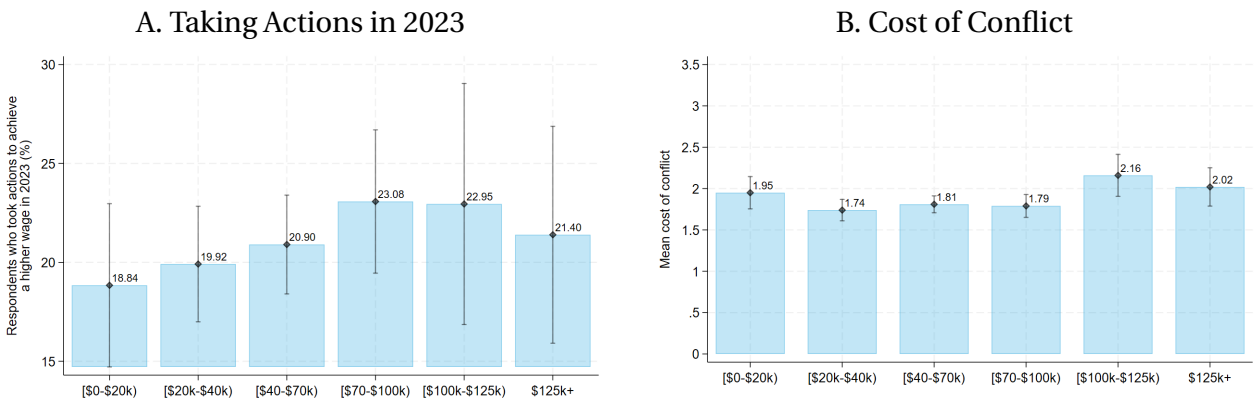
B Additional Empirical Analysis

Figure B.1: Heterogeneity in Conflict: Demographics



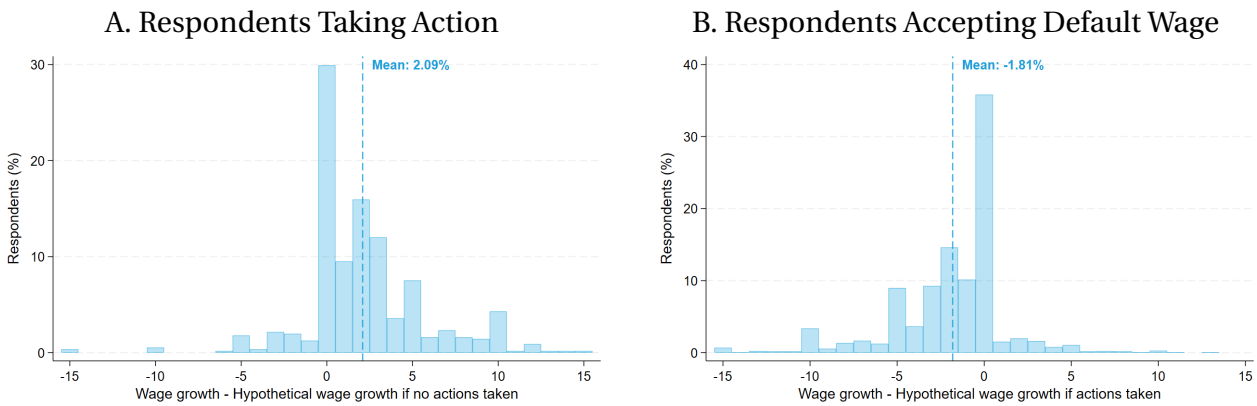
Note: Panel A displays the percentage of participants who took actions to achieve a higher wage in 2023, with 95% confidence intervals shown for each demographic category. Panel B illustrates the mean cost of conflict, also with 95% confidence intervals displayed for each demographic category. Cost of conflict is defined as the difference between the wage growth participants believe they will receive if they take actions to increase their pay ($\Delta W^{\text{conflict}}$) in the next 12 months and their indifference wage (ΔW^{indiff}), which is the wage growth participants would be willing to accept if offered by their employers in the next 12 months. Panel B restricts the data to respondents who bargain first and then accept the offer. The categories depicted include inflation expectations, firm profits, union membership, employer type, education level, age, and gender.

Figure B.2: Heterogeneity in Conflict: Income



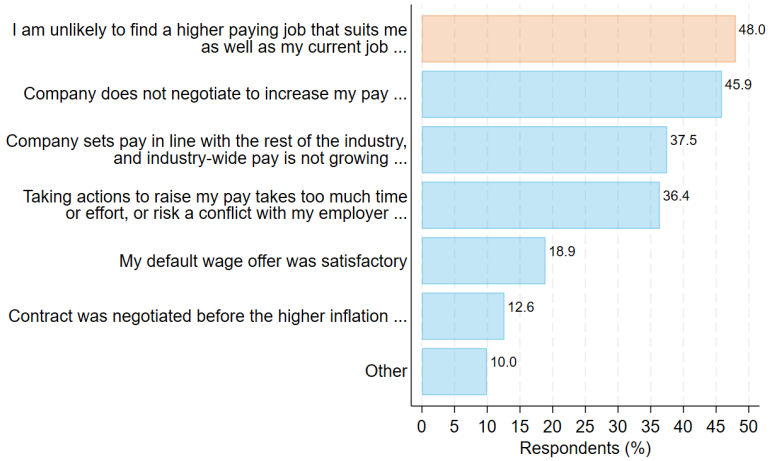
Note: Panel A shows the percentage of participants who took actions to achieve a higher wage in 2023, with 95% confidence intervals displayed for each income category. Panel B illustrates the mean cost of conflict, also with 95% confidence intervals shown for each income category. The cost of conflict is defined as the difference between the wage growth participants believe they will receive if they take actions to increase their pay ($\Delta W_{\text{conflict}}$) in the next 12 months and their indifference wage (ΔW_{indiff}), which is the wage growth participants would be willing to accept if offered by their employers in the next 12 months. Panel B restricts the data to respondents who bargain first and then accept the offer.

Figure B.3: The Effectiveness of Conflict: Within-Individual Distributions



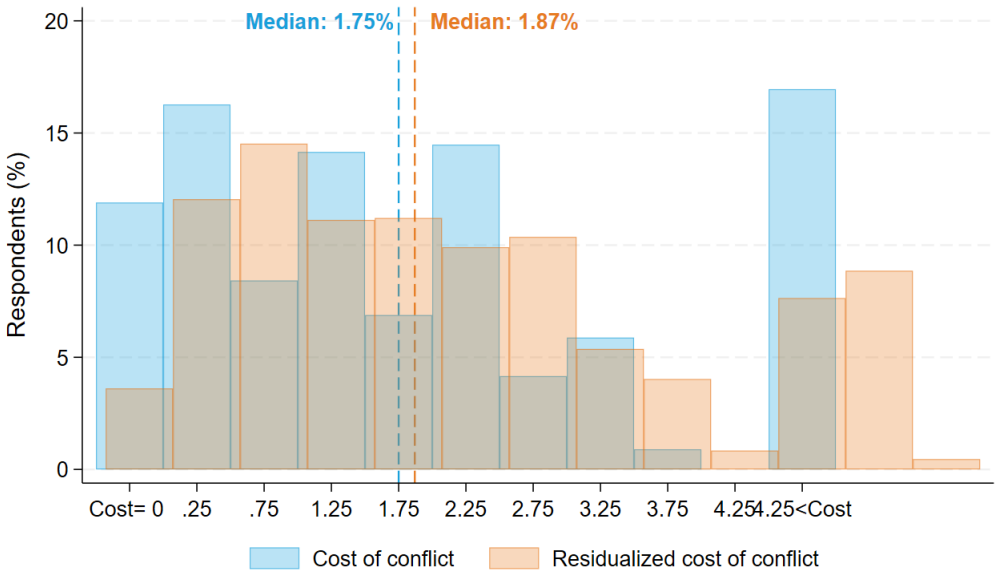
Note: Panels A and B depict difference between the reported wage growth during 2023 and the hypothetical wage growth respondents reported they would have received if no actions had been taken or if actions had been taken to achieve a higher pay, respectively. The unit of observation is the respondent. The data range has been truncated, with values ranging from a minimum of -15% to a maximum of 15%. The data has been restricted to respondents who indicated that they took actions to achieve a higher pay during 2023 in Panel A and to respondents who indicated that a union took actions to achieve a higher pay on their behalf or that they accepted their employers' default wage during 2023 in Panel B.

Figure B.4: Motivation to Accept Wage Offer



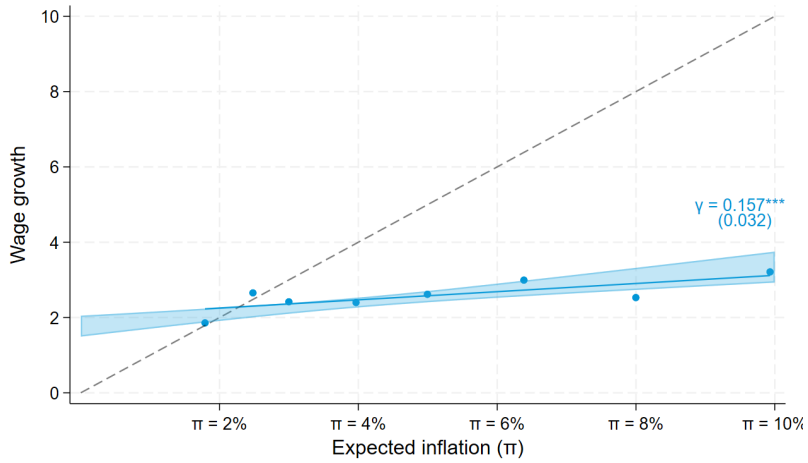
Note: This figure illustrates the percentage of survey participants who stated their motivations to accept their employers' default pay offer during 2023. Each bar in the figure represents the following answer choices in order: "I am unlikely to be able to find a higher paying job that suits me as well as my current job, perhaps because of the perks and benefits offered by my job, or because there are few good alternative jobs."; "My company does not negotiate to increase my pay. Perhaps because they would have to lay off workers or because they can replace me with another employee."; "My company sets pay in line with the rest of the industry, and industry-wide pay is not growing, perhaps because of the state of the overall economy."; "Taking actions to raise my pay, such as a difficult conversation or searching for a new job, is too difficult. These actions take too much time or effort, or risk a conflict with my employer."; "My employer's default wage offer was satisfactory, because they offered wage growth in excess of the increase in my cost of living."; "My contract was negotiated before the higher inflation."; and "Other, please add additional comments below". The data in this figure only includes respondents who stated that they accepted their employers' default pay offer during 2023.

Figure B.5: Cost of Conflict: Residualized for Demographics



Note: The figure illustrates the overlaid histogram of cost of conflict and the residualized cost of conflict, showing the percentage of participants with each value. The cost of conflict, illustrated in blue in the figure, is defined as the difference between the wage growth participants believe they will receive if they take actions to increase their pay ($\Delta W^{\text{conflict}}$) in the next 12 months and their indifference wage (ΔW^{indiff}), which is the wage growth participants would be willing to accept if offered by their employers in the next 12 months. The residualized cost of conflict, illustrated in orange in the figure, has been generated by regressing cost of conflict on dummy variables for the categories of age, education, income, and union coverage. The categories excluded were 30-49 years old, income of [100k-125k), graduate education, and non-union coverage or not reported union coverage. The data is limited to respondents who bargain first and then accept the offer.

Figure B.6: Wage Indexation: Variation from Inflation Expectations



Note: This figure restricts observations to respondents who expect an inflation rate of no more than 10% next year, excluding 36.24% of the sample of respondents who predict that prices will go up next year. This binned scatterplot depicts the relationship between the default wage and the expected inflation in the following 12 months, along with the 95\% confidence interval of the predicted relationship. The default wage is defined as the wage growth that participants anticipate their employers will offer them next year. The gray dashed line serves as a reference 45-degree line. The coefficient of this relationship is displayed, with the standard errors enclosed in brackets. The stars indicate levels of statistical significance: 1% (***), 5% (**), and 10% (*).

Table B.1: Distributions in Survey Sample vs. Population

	Survey	US population
Male	0.52	0.52
Female	0.48	0.48
Secondary education (e.g. GED/GCSE)	0.02	0.02
High school diploma/A-levels	0.37	0.39
Technical/community college	0.12	0.11
Undergraduate degree (BA/BSc/other)	0.32	0.30
Graduate degree (MA/MSc/MPhil/other)	0.14	0.13
Doctorate degree (PhD/other)	0.04	0.04
Democrat	0.29	0.28
Republican	0.25	0.26
Independent	0.33	0.33
None	0.06	0.07
Other party	0.06	0.06
22-29 years old	0.24	0.20
30-39 years old	0.38	0.29
40-49 years old	0.21	0.26
50-60 years old	0.17	0.26
Full-Time	0.83	0.83
Part-Time	0.17	0.17
For-profit company	0.80	0.77
Not-for-profit corporation	0.10	0.07
State government	0.03	0.06
Federal government	0.02	0.03
Local government	0.04	0.07
Other employer	0.01	
White	0.68	0.75
Black	0.12	0.14
Asian	0.08	0.07
Mixed	0.08	0.02
Other	0.04	0.02
No reported ethnicity	0.00	
Covered by a union	0.11	0.13
Not part of a union	0.81	0.87
No reported	0.07	

Income		
$0-$19,999	0.11	0.12
$20,000-$39,999	0.24	0.22
$40,000-$69,999	0.34	0.31
$70,000-$99,999	0.17	0.16
$100,000-$124,999	0.06	0.08
$125,000+	0.07	0.11

Note: The table displays statistics for the overall U.S. population, as compared to the sample of respondents in our survey. We pre-screen so that our respondents are at least 22 years old but no older than 60, full-time or part-time employed, and not self-employed. The statistics for the U.S. population were also limited by these criteria before taking the summary statistics, which are constructed using IPUMS-CPS-ASEC data for March 2023, and Gallup data for 2024.

Table B.2: Inflation and Union Strikes: Robustness Table

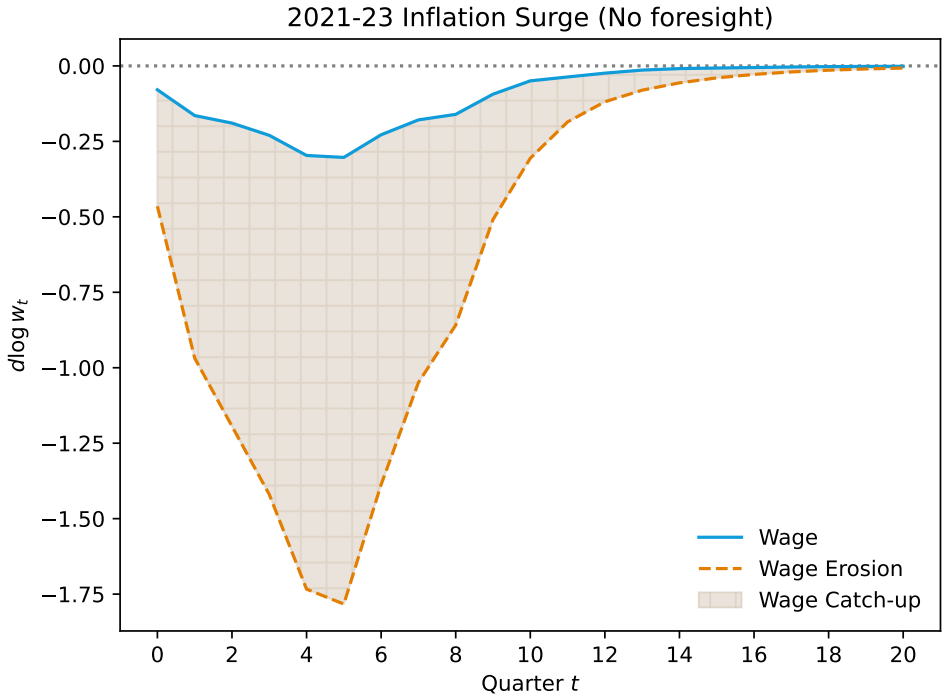
C Additional Model Analysis

[Under Construction]

D Additional Quantitative Analysis

D.1 The 2021-23 Inflation Surge without Perfect Foresight

Figure D.1: The Effect of 2021-23 Inflation Without Perfect Foresight



Notes: The path of inflation matches headline quarterly PCE inflation over 2021-3. We plot the percent deviation of the real wage from steady state in the solid blue line. We plot the welfare effect of the inflationary shock in dashed orange, which is wage erosion. The gap between the two lines, shaded in grey, is wage catchup, which is associated with conflict costs. Different to the main text, agents do not have perfect foresight. Instead, they are expect inflation to be at the steady state in the next period, and are surprised by every subsequent realization of inflation away from the steady state.

E Survey Questionnaire

E.1 Pre-screening background questions

1. Before we begin, please enter your Prolific ID below.

   [Text box]

2. What is your current age in years?

   [Text box]

   [We accepted participants aged 22 to 60 years old.]

3. What is your employment status?

   [Full-Time; Part-Time; Due to start a new job within the next month; Unemployed (and job seeking); Not in paid work (e.g. homemaker, retired or disabled); Other]

   [We accepted participants who selected Full-Time or Part-Time]

4. Please describe your work

   [Employee of a for-profit company or business or of an individual, for wages, salary, or commissions; Employee of a not-for-profit, tax-exempt, or charitable organization; Local government employee (city, county, etc.); State government employee; Federal government employee; Self-employed in own not-incorporated business, professional practice, or farm; Self-employed in own incorporated business, professional practice, or farm; Working without pay in family business or farm; None of the above]

   [We rejected participants who selected Self-employed in own not-incorporated business, professional practice, or farm; Self-employed in own incorporated business, professional practice, or farm or Working without pay in family business or farm]

E.2 Consent

This is a consent form. Please read and click below to continue.

Study background: this is a study by researchers at the London School of Economics, the University of Chicago, and the University of California. Your participation in this research will take approximately 7 minutes.

What happens in this research study: if you decide to participate, you will be asked to complete a series of questions about your perceptions of inflation, the costs of inflation, and how you negotiate your pay. You will also answer basic questions about demographics.

Compensation: there are no costs to you for participating in this research study, except for your time. On completion of the survey, you will be redirected to Prolific. You will be paid around \$1.5 for completing the survey.

Risks: Your involvement in this study poses no additional risks beyond those encountered in daily life.

Benefits: Participating in this research offers compensation, as detailed earlier. Additionally, the findings may contribute to society by informing better policymaking. This, in turn, can guide efforts to minimize the negative effects of inflation. Voluntary participation: participating in this research is voluntary. You can withdraw from the study at any time.

Confidentiality: We will collect data through a Qualtrics questionnaire in the University of Chicago system, overseen by our Research Team. All gathered data will be securely stored in a password-protected Dropbox account dedicated to this research project. Identifiable data will not be collected as part of this study. If you decide to withdraw, any collected data will be permanently deleted. De-identified information from this study may be used for future research studies or shared with other researchers for future research without your additional informed consent.

Contact: For questions, concerns, or complaints about this research, contact the researchers at danielav@uchicago.edu. For inquiries regarding the IRB process for this study, reach out to the University of Chicago IRB team at cdanton@uchicago.edu.

Agreement to participate: by clicking continue, you indicate that you have read this consent form and voluntarily agree to participate in the study.

E.3 Preamble

The button to continue will appear after 15 seconds.

The **annual inflation** rate measures how much prices in the economy rise from year to year. It is defined as the yearly growth of the general level of prices of goods and services. For example, an inflation rate of 2\% means that, on average, prices for goods and services rise by 2\% over 12 months. In other words, an average bundle of goods and services that costs \$100 at the beginning of a year costs \$102 at the end of the year. If the inflation rate is negative, it is referred to as deflation. Deflation means that, on average, prices of goods and services fall from one year to the next.

E.4 Demographics

1. How long have you been working for your current employer?

[Less than 1 year; Between 1 and 3 years (2); Between 3 and 5 years (3); Between 5 and 10 years (4); More than 10 years (5)]

2. Do most people in your occupation or industry have their pay set by a union?

[Yes; No; I don't know]

3. Which category represents your annual pre-tax individual pay from your current employer?

If you have multiple jobs, please report the pay in the job in which you have the most earnings

[15 non-overlapping brackets from $0-$9,999 to $200,000 or more]

4. What is the value of your household's **total financial investment** (checking and savings accounts, stocks, bonds, 401(k), real state, etc.) **minus total financial liabilities** (credit card debt, mortgages, student loans, consumer loans, etc.)? If you are not sure, please estimate.

You should choose a negative range if the value of your liabilities is greater than the value of your investments.

[29 non-overlapping brackets from - $50,000 or less to $1,000,000 or more]

E.5 Experienced inflation in 2023

1. During the year 2023, did prices in general go up or down?

[*Prices in general went up; Prices in general went down; Prices in general stayed the same; I don't know]*

- **Branch:** If in Q1 of this section "Prices in general went up"

2. During the year 2023, by what percent did prices in general rise?

Please write your answer in percent. If you mean x\%, input x.

[Text box]%

3. A general rise in prices in the economy, which we call inflation, can have many effects, both positive and negative. On net, do you think your household was made better or worse off because of inflation in the year 2023?

[*We were substantially worse off; We were somewhat worse off; Inflation didn't really affect our household; We were somewhat better off; We were substantially better off]*

- **Same branch:**
  - **Sub-branch:** If in Q3 of this branch "We were substantially worse off" OR "We were somewhat worse off"

4. What were the biggest factors that contributed to your dislike for the rise in inflation (which is defined as the growth rate in prices) in the year 2023?

*Please pick **up to three reasons.***

[Inflation hurts my real buying power, it makes me poorer: things that I buy became more expensive more quickly than my pay rose.; Inflation reduced the value of my savings, such as my investments or pension, potentially meaning I had to change my saving behavior.; Inflation causes a lot of inconvenience: budgeting and financial planning is more difficult and confusing for me, for example, I find it

harder to comparison shop or plan my savings decisions.; Inflation is bad for society overall, for instance because inflation harms the overall economy, reduces political stability, disproportionately harms disadvantaged groups.; Inflation makes it challenging for businesses to operate effectively. When inflation is high, businesses struggle to set accurate prices for their goods and services. This leads to a poor allocation of resources and production.; Higher inflation makes it harder to know what will happen in the future.; Other, please add additional comments below [Text box]]

5. Please rank your top reasons that contributed to your dislike for the rise in inflation (which is defined as the growth rate in prices) in the year 2023, from the most (1) to the least (3) important reason.

[The options chose by respondents in the previous questions with radio bottoms next to them to rank these options]

- **Same branch:**
  - **Same sub-branch:**
    - **Under sub-branch:** If in Q4 of this sub-branch "Inflation hurts my real buying power, it makes me poorer: things that I buy became more expensive more quickly than my pay rose."

6. Message: You previously suggested that a key reason that you disliked inflation was that the things that you buy became expensive more quickly than your pay rose, which reduced your standard of living. We want to understand more about your answer.

- **Same branch:**
  - **Same sub-branch:**
    - **Under sub-branch:** If in Q4 of this sub-branch not selected "Inflation hurts my real buying power, it makes me poorer: things that I buy became more expensive more quickly than my pay rose."

6. Message: You previously suggested that pay not keeping up with prices was not a key cost of inflation for your household over the past year. We want to understand a little bit more about why this is.

- **Same branch:**
  - **Sub-branch:** If in Q3 of this branch "Inflation didn't really affect our household"

4. What were the reasons why you were not affected by inflation in the year 2023?

[My income, or my household's income, increased at roughly the same rate as inflation, ensuring that my real buying power did not fall as inflation rose.; My household altered our spending behavior in order to consume cheaper goods but maintain our living standards.; My household didn't notice any significant changes in the price of the goods that we buy. We could afford what we needed without cutting back on our budget.; Other, please add additional comments below[Text box]]

- **Same branch**
  - **Sub-branch:** If in Q3 of this branch "We were somewhat better off" OR "We were substantially better off"

4. Why do you think your household was made better off because of inflation in the year 2023?

[My income, or my household's income, increased at a higher rate than inflation, ensuring an increase in my real buying power; Other, please add additional comments below[Text box]]

- **Branch:** If in Q1 of this section "Prices in general went down"

2. During the year 2023, by what percent did prices in general fall?
Please write your answer in percent. If you mean x\%, input x.

[Text box]%

3. A general fall in prices in the economy, which we call deflation, can have many effects, both positive and negative. On net, do you think your household was made better or worse off because of deflation in the year 2023?

[We were substantially worse off; We were somewhat worse off; Deflation didn't really affect our household; We were somewhat better off; We were substantially better off]

- **Same branch:**
  - **Sub-branch:** If in Q3 of this branch "We were substantially worse off" OR "We were somewhat worse off"

4. Why do you think your household was made worse off because of deflation in the year 2023?

[Text box]

- **Same branch:**
  - **Sub-branch:** If in Q3 of this branch "Deflation didn't really affect our household"

4. Why do you think your household was not really affected by deflation in the year 2023?

[Text box]

E.6 Exploring actions to increase pay

1. What was your pay growth in 2023?
Please write your answer in percent. If you mean x\%, input x.

[Text box]%

2. Common strategies to increase pay include initiating a difficult conversation with your employer to ask for a raise, searching for higher paying jobs with other employers, or switching employers in order to get a raise. Moreover, you could have obtained a second job or worked longer hours to get a raise. A union could also bargain for higher pay on your behalf.
Did your employer offer you this [Stated pay growth value in Q1 in this section]\% \textbf{by default \textbf{or did you, or a union on your behalf, \textbf{use any of the actions above or other actions to increase your pay?

[My employer offered me this pay by default.; My employer did not offer me this pay by default and I, or a union on my behalf, used some of the strategies above.]

- **Branch:** If in Q2 of this section "My employer offered me this pay by default."

3. What was your motivation for accepting your employer's default wage offer and not taking other actions to negotiate a higher pay raise?
*Please pick **up to three options.***

[My company does not negotiate to increase my pay. Perhaps because they would have to lay off workers or because they can replace me with another employee.; I am unlikely to be able to find a higher paying job that suits me as well as my current job, perhaps because of the perks and benefits offered by my job, or because there are few good alternative jobs.; My company sets pay in line with the rest of the industry, and industry-wide pay is not growing, perhaps because of the state of the overall economy.; Taking actions to raise my pay, such as a difficult conversation or searching for a new job, is too difficult. These actions take too much time or effort, or risk a conflict with my employer.; My employer's default wage offer was satisfactory, because they offered wage growth in excess of the increase in my cost of living.; My contract was negotiated before the higher inflation.; Other, please add additional comments below [Text box]]

4. Please rank your top reasons for accepting your employer's default wage offer and not taking other actions to negotiate a higher pay raise, from the most (1) to the least (3) important reason.

[The options chose by respondents in the previous questions with radio bottoms next to them to rank these options]

- **Branch:** If in Q2 of this section "My employer did not offer me this pay by default and I, or a union on my behalf, used some of the strategies above."

3. Did you take any of the following actions to achieve this pay change?

Please select all that apply

[I initiated a difficult conversation with my employer about my pay; I searched for a higher paying job with other employers, to make it easier to bargain with my employer over pay; I switched employers in order to get a raise; I obtained a second job in addition to my main job; I worked longer hours or performed better at work in order to get a performance based pay increase; A union bargained for higher pay on my behalf; Other, please add additional comments below [Text box]]

4. Above, you indicated that you got a pay raise of this [Stated pay growth value in Q1 in this section]\% by implementing a common strategy to increase pay such as initiating a difficult conversation with your employer to ask for a raise, searching for higher paying jobs with other employers, switching employers in order to get a raise or other. Moreover, you could have obtained a second job or worked longer hours to get a raise. A union could have also bargained for higher pay on your behalf.

If you, or possibly your union, had \textbf{not implemented any of these strategies, what pay growth do you think your employer would have offered you in 2023?

Please write your answer in percent. If you mean x\%, input x.

[Text box]%

5. What was your, or your union's, motivation for taking actions in order to secure a pay increase in 2023?

*Please pick **up to three options.***

[My cost of living increased due to high inflation, therefore I needed more money to fund my spending and saving plans; My performance and output in the workplace increased significantly; I always bargain for pay; It was a long time since the last time my pay had been increased; Other, please add additional comments below[Text box]]

6. Please rank your top reasons for taking actions in order to secure a pay increase in 2023, from the most (1) to the least (3) important reason.

[*The options chose by respondents in the previous questions with radio bottoms next to them to rank these options]*

- **Same branch:**
  - **Sub-branch:** If in Q3 of this branch "I initiated a difficult conversation with my employer about my pay"

8. How many times in 2023 did you initiate a difficult conversation with your employer about your pay?

[Text box] times

9. Compared to a typical year, how were the conversations with your employer about pay?

[The conversations were substantially easier; The conversations were somewhat easier; The conversations were the same as a typical year; The conversations were somewhat more difficult; The conversations were substantially more difficult]

- **Same branch:**
  - **Sub-branch:** If in Q3 of this branch "A union bargained for higher pay on my behalf"

10. Compared to a typical year, did your union take more actions to increase pay in 2023 (e.g. engage in a tough negotiation or go on strike)?

[Compared to a typical year, my union did not take more actions to increase pay.; Compared to a typical year, my union took more actions to increase pay. My union engaged in tougher negotiations.; Compared to a typical year, my union took more actions to increase pay. My union organized a strike.; Compared to a typical year, my union took other actions to increase pay, please add additional comments below. [Text box]]

- **Same branch:**
  - **Sub-branch:** If in Q3 of this branch "I obtained a second job in addition to my main job"

11. In how many months in 2023 did you work for a second job in addition to your main job?

[Text box] months

12. Compared with a typical year, did you spend more months working on a second job in addition to your main job in 2023?

[Yes; No]

- **Same branch:**
  - **Sub-branch:** If in Q3 of this branch "I searched for a higher paying job with other employers, to make it easier to bargain with my employer over pay"

13. In how many months in 2023 did you submit at least 1 job application?

[Text box] months

14. Compared to a typical year, did you submit more job applications in 2023?

[Yes; No]

- **Same branch:**
  - **Sub-branch:** If in Q3 of this branch "I worked longer hours or performed better at work in order to get a performance based pay increase"

15. In how many months in 2023 did you work longer hours or did extra work to increase your performance?

[Text box] months

16. Compared to a typical year, did you work longer hours or did extra work to increase your performance in 2023?

[Yes; No]

- **Same branch:**
  - **Sub-branch:** If in Q3 of this branch "I switched employers in order to get a raise"

17. How many times in 2023 did you switch employers in order to get a raise?

[Text box] times

18. Compared to a typical year, did you switch employers more times in order to get a raise in 2023?

[Yes; No]

- **Branch:** If in Q2 of this section "My employer did not offer me this pay by default and I, or a union on my behalf, used some of the strategies above" but the only choice selected in Q2 of this section was "A union bargained for higher pay on my behalf" OR if in Q1 of this section "My employer offered me this pay by default."

19. Above, you indicated that you got a pay growth of [Stated pay growth value in Q1 in this section]\% in 2023.
What pay growth do you think you could have attained in 2023 if you had taken actions such as initiating a difficult conversation with your employer to ask for a raise, searching for higher paying jobs with other employers, switching employers in order to get a raise, or others?
Please write your answer in percent. If you mean x\%, input x.

[Text box] %

E.7 Employer's profits

1. During the year 2023, do you think that your employer's profits:

[Went up; Stayed the same; Went down; Not relevant - I work for a non-profit or government; I don't know]

E.8 Attention check

1. In questionnaires like ours, sometimes there are participants who do not carefully read the questions and quickly click through the survey. This means that there are a lot of random answers which

compromise the results of research studies. To show that you read our questions carefully, please enter turquoise as your answer to the next question.

What is your favorite color?

[Text box]

E.9 Future inflation

1. During the next 12 months, do you think that prices in general will go up, or go down, or stay where they are now?

[Go up; Stay the same; Go down; I don't know]

- **Branch:** If in Q1 of this section "Go up"

2. By about what percent do you expect prices to go up on the average, during the next 12 months?
Please write your answer in percent, if you mean x\%, input x

[Text box] %

- **Branch:** If in Q1 of this section "Go down"

2. By about what percent do you expect prices to go down on the average, during the next 12 months?
Please write your answer in percent, if you mean x%, input x

[Text box] %

E.10 Cost of conflict

Common strategies to increase pay include initiating a difficult conversation about pay with employers, or searching for higher paid jobs with other employers. Please, think ahead to 12 months from now. Suppose that you are working at the same job at the same place you currently work, and working the same number of hours.

1. What pay growth do you think you would get by default if you do \textbf{not take any strategies at your disposal to increase your pay, including the common strategies listed above?
Please write your answer in percent, if you mean x%, input x

[Text box] %

2. What pay growth do you think you would get if you do your best to increase pay using any strategies at your disposal, including the common strategies listed above?
Please write your answer in percent, if you mean x%, input x

[Text box] %

3. Your employer increases pay for everyone in your position, including you, by \textbf{z\% (possible values listed below). Would you accept your employer's offer \textbf{without taking any actions to increase your pay \textbf{or would you do your best to increase your pay using any strategies at your disposal (such as initiating a difficult conversation about pay with employers, or searching for higher paid jobs with other employers)?

Remember that you have said that if you do your best to increase pay using any strategies at your disposal, you would have a pay growth of [Stated pay growth value in Q2 in this section]%.

[9 rows presented in either descending or ascending order, each with different pay growth values. The maximum value corresponds to the pay growth stated in Q2 of this section, while the minimum value is this pay growth value minus 4. The difference between each row is 0.5 percentage points. For each row, respondents are presented with two options: "I would accept my employer's pay growth offer" or "I would do my best using any strategies at my disposal to increase my pay further."]

E.11 Hypothetical inflation

[In this section, participants were randomly assigned to one of 5 possible hypothetical inflation scenarios, either 2%, 4%, 6%, 8% or 10%.]

Consider a hypothetical situation in which inflation is expected to be \textbf{[Hypothetical inflation]\% in the next 12 months. Suppose that you are working at the same job at the same place you currently work, and working the same number of hours.

1. What pay growth do you think you would get by default if you do \textbf{not take any strategies at your disposal to increase your pay (such as initiating a difficult conversation about pay with employers, or searching for higher paid jobs with other employers)?

Please write your answer in percent, if you mean x%, input x

[Text box] %

2. Would you accept your employer's offer without taking any actions to increase your pay or would you do your best to increase your pay using any strategies at your disposal?

[I would accept my employer's pay growth offer; I would do my best using any strategies at my disposal to increase my pay further]