January 2024

Is Inflation Caused by Conflict?

Nicolas Cachanosky

Emilio Ocampo

UTEP
HUNT INSTITUTE
FOR GLOBAL COMPETITIVENESS

WORKING PAPER SERIES 1 FALL 2023

Is Inflation Caused by Conflict?

May 5, 2023

We offer a critique of a paper recently published Lorenzoni and Werning (2023) that seeks to make an original contribution to the hypothesis that inflation is primarily caused by con-flict and reconcile the Post-Keynesian and New-Keynesian traditions. L&W's paper has two sections. In the first they develop a barter model that allows them to prove that inflation can occur with conflict and without money. In the second section they incorporate the conflict hypothesis into a broader framework compatible with New Keynesian models. We question the logical consistency and empirical validity of the barter model and the testability of the model with staggered pricing assumptions. We also trace the ideological roots of inflation as conflict hypothesis and highlight the policy implications that must be logically derived from it.

JEL Codes: E31

Keywords: *conflict, inflation*

Nicolás Cachanosky
Center for Free Enterprise
The University of Texas at El Paso

Emilio Ocampo
Centro de Estudios de Historia Economica
Universidad del CEMA

UTEP

IS INFLATION CAUSED BY CONFLICT?

Nicolás Cachanosky
Center for Free Enterprise
University of Texas at El Paso
500 West University Avenue
El Paso, TX 79968, United States
ncachanosky@utep.edu

Emilio Ocampo
Centro de Estudios de Historia Económica
Universidad del CEMA
Av. Córdoba 374, (C1054AAP) Ciudad de Buenos Aires, Argentina
eo@ucema.edu.ar

5-May-23

Abstract

We offer a critique of a paper recently published Lorenzoni and Werning (2023) that seeks to make an original contribution to the hypothesis that inflation is primarily caused by conflict and reconcile the Post-Keynesian and New-Keynesian traditions. L&W's paper has two sections. In the first they develop a barter model that allows them to prove that inflation can occur with conflict and without money. In the second section they incorporate the conflict hypothesis into a broader framework compatible with New Keynesian models. We question the logical consistency and empirical validity of the barter model and the testability of the model with staggered pricing assumptions. We also trace the ideological roots of inflation as conflict hypothesis and highlight the policy implications that must be logically derived from it.

JEL Codes: E31

Keywords: conflict, inflation

1. Introduction

In our understanding, the paper by Lorenzoni and Werning (2023, henceforth L&W) seeks to make an original contribution to the conflict theory of inflation as developed by Rowthorn (1977) by: 1) "isolating" conflict as the proximate cause of inflation with a simplistic barter model, and 2) incorporating conflict into a broad New Keynesian model with staggered wages and prices in which workers' and firms' "aspirations" are built into expectations under various assumptions. Following in Blanchard's footsteps, L&W attempt to "reconcile" conflict theories of inflation common in the Post-Keynesian tradition with those of developed under the New Keynesian paradigm (for an overview see Vernengo, 2005, Lavoie, 2014; Lavoie and Rochon, 2023) and reinforce the conclusion that conflict is "the most general and proximate cause for inflation."

We can summarize our conclusions as follows. Besides having serious doubts about the practical relevance and the utility of L&W's barter model, we find its assumptions methodologically questionable, since they include an "imaginary" *numéraire.* It is a pseudo barter model that only proves that in a completely unrealistic setting, conflict could generate inflation (if an imaginary *numéraire* exists.) Its mathematical consistency does not guarantee its conceptual soundness or practical relevance. With respect to incorporating the conflict hypothesis into a New Keynesian model with staggered prices and wages and rational expectations, we also question its empirical validity. Finally, we believe it is important to highlight the ideological roots of the conflict theory of inflation and the policy prescriptions that logically follow from it.

We base our comments on the paper published by NBER in April 2023.

2. Barter with Money

Let us start with a summary of L&W's barter model. The model has two agents, A and B and two goods, A (apples) and B (bananas). A owns A (apples), and B owns B (bananas). Both endowments are normalized ($A = B = 1$). Apples and bananas are perishable and must be consumed in each period. Both agents derive utility from consuming both goods. Agents take turns to be the seller or the buyer. In even periods $(0, 2, 4, \dots)$, A is the seller, and B is the buyer. In odd periods $(1, 3, 5, \dots)$, B is the seller, and A is the buyer. The seller sets a take-or-leave-it price, and the buyer decides how many goods to trade with the seller. In each period, the seller re-sets its price.

Both agents aim to maximize their selling price. Because the roles of buyer and seller rotate from period to period, they "alternate these conflicting aspirations. As a result, inflation is driven by the alternating market power which creates a form of conflict regarding the desired relative price" (p. 8). Monopolistic power allows for a markup on each period. The model outcome is constant and positive inflation (Proposition 1 in p.8).

L&W continue to extend their model to include additions such as random buyers and seller roles, non-symmetric preferences, expectations, and random matching. These extensions are interesting. But, as mentioned above, we focus on the basic barter model for the same reasons L&W give: to highlight the role of conflict in inflation.

In their barter model L&W define *price* and *inflation* in a way we find problematic. And since their model is about inflation, these two terms are key.

A *price* is not just a number, it is a ratio of exchange between two different goods. For instance, the number of apples a buyer must give a seller in exchange for one banana. In this case, the price of bananas is $p_B = \frac{number\ of\ apples}{one\ banana}$. A *monetary price* is the same, where the good delivered by the buyer is money (\$): $p_B = \frac{how\ many\ \$}{one\ banana}$. As trivial as this explanation sounds, it is also fundamental.

In a barter economy there is no money and therefore there are no *monetary prices*. But in L&W's model there is an imaginary *numéraire* (L&W, p. 8).[1] This creates a dilemma. Either there is no money, and prices are non-monetary, or there is money, and prices are monetary. We understand that one can imagine a barter economy in which prices are denominated in an imaginary currency or *numéraire*. We can just as easily imagine unicorns. The issue is not whether it is *easy* to imagine a monetary price in a barter economy. The issue is whether such an assumption makes sense. In our opinion, a more promising approach would be to study how much inflation can conflict generate given a fixed money supply even if this would be less revolutionary.

There is another reason why the assumption of no money is important for how prices are defined. A price reflects the units of a good that must be *delivered* to acquire one unit of another good. This means that the *numéraire* cannot be imaginary, it must exist in the barter economy to be traded. With a fixed supply, unless goods are infinitesimally divisible (one

[1] We do not claim that L&W are new in building a model with no money. This is a common approach to new-Keynesian models. However, the reason new-Keynesian models do not model money is because monetary policy targets interest rates, which makes money redundant in the model. This is different from L&W's barter model, in which money is excluded not due to redundancy but to isolate the impact of conflict.

apple for one atom of a banana), prices cannot increase indefinitely. Prices reflect real exchanges, not imaginary numbers. In the barter case, a certain number of apples must be delivered to receive one banana. Infinitesimally divisible goods can be imagined in a barter economy, but they are not feasible in the real world. Both goods must exist and be exchanged. Assuming an imaginary *numéraire* is like inserting money back to the barter model through the back door. Also, having prices in terms of the *numéraire* means giving a price to the *numéraire* in terms of apples and bananas.[2] The *numéraire*, then, becomes another good in the model.[3] By assuming barter and a *numéraire* the behavior of money supply becomes less clear and transparent than in other models with an explicit recognition of money.

Inflation is defined as a *continuous* increase in the *general price level* of goods and services or the loss of *money's purchasing power*. It follows that inflation cannot exist in a barter economy. There is a crucial difference between a model that attempts to explain inflation assuming a fixed supply of money and one that attempts to explain inflation assuming there is no money. If there is no money, then it is not possible for the price of money to change.

Measuring inflation requires us to construct a price index and to construct a price index we need money (*numéraire*), which is absent in a barter model. A price index is, in simple terms, the ratio of two weighed sum of prices, where the weights are the quantities traded of each good $\left(P_t = q_{1,t}p_{1,t} + q_{2,t}p_{2,t} + \cdots\right)$. *Monetary prices* are necessary to algebraically calculate a

[2] At the risk of sounding trivial again, if \$ is the *numéraire* and the price of applies is $p_A = \frac{\$20}{1\ apple}$, then the price of the *numéraire* in terms of apples is $\frac{1}{p_A} = \frac{0.50\ apples}{1\$}$.

[3] There are models where money and the unit of account are different. An example is Greenfield and Yeager (1983). For a discussion see White (1999, Chapter 13).

price index.[4] Imagining a *numéraire* in a barter economy works as a mathematical trick that allows this calculation. If one takes the assumption of no money seriously, then there are no monetary prices and no price index. In other words, without money there is no inflation.

How can inflation be calculated if there are only apples and bananas? One option is to make one of these goods the *numéraire*. This means going from a barter economy to a monetary economy. The other option is adding an imaginary *numéraire* which, as we saw, means inserting money into the model. A third option is to change the standard definition of price and inflation into something else. Since L&W do not offer alternative definitions of price and inflation, we can assume they endorse the typical "textbook" definitions of *price* and *inflation*.

L&W believe that money –passive or otherwise– is not necessary in their model for inflation to arise, just conflict. However, by inserting an imaginary *numéraire*, L&W assume monetary prices, and by letting the *numéraire* price rise permanently, they implicitly assume the supply of *numéraire* increases, i.e., money adjusts passively to changes in relative prices. It is worth noting that such an assumption contradicts Rowthorn (1977), who assumes money to be exogenous to the system.

We can now see that L&W's model allows for a passive money interpretation as developed by Olivera (1970). Although we find the structuralist theory problematic, we believe that it offers a more coherent and compelling theory of how changes in relative prices can lead to inflation than L&W or Rowthorn's theory. Olivera (1960, 1970) starts by recognizing that

[4] If p_A and p_B are \$10 and \$20 respectively, and q_A and q_B are 2 and 4 respectively, then: $P = 2\ apples \times \frac{\$10}{1\ apple} + 2\ bananas \times \frac{\$20}{1\ banana} = \$60$. The ratio of two price indices yields a number without any measurement unit (the currency sign "cancels out").

inflation is a monetary phenomenon that can be generated by non-monetary factors. In the classic structuralist story, the economy has downwardly rigid prices, particularly for labor, and limited supply elasticities in most productive sectors and the monetary authority acts "passively" when relative price changes occur. In such world, the inflationary impulse comes from a change in the conditions that determine the relative prices and the consequent tendency of the latter to change.

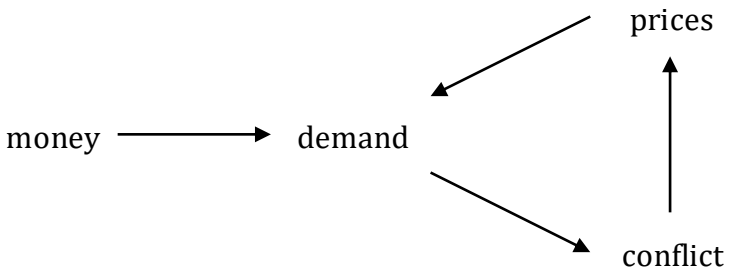
Despite the gap between the proposed model and the real world, L&W (p. 3) state that "the results of our stylized model attempt to leave no easy way out of this traditional mindset, leave no natural interpretation for inflation except conflict." In their view, inflation is caused by "incompatible goals over relative prices, with conflicting economic agents each having only partial or intermittent control over" (p. 2). It is unclear how do L&W propose to measure conflict, the level of incompatibility of economic agents' goals over relative prices, or the length of period during which an economic agent has control over prices. Conflict takes place by construction (as a tautology) inside the model.

3. Post-Keynesians Meet New Keynesians

Our main issue with L&W's proposed reconciliation of the two modern Keynesian traditions is the scientific validity of the model they propose. In their model, inflation is proportional to conflict as they define it. If there is no conflict, there is no inflation. Operationally, L&W define conflict as the difference between worker's "wage aspirations" and firms' "profit aspirations." Both aspirations are expressed in terms of a "desired real wage", which L&W implicitly

assume is homogeneous and, more importantly, knowable.[5] We have a methodological objection to this type of model: it is impossible to know what the values of the model equation's parameters are (see Hayek, 1974 and Caballero, 2010).

Once again, it is worth noting an inconsistency between L&W's model and Rowthorn's original theory in which conflict is endogenous to money. In Rowthorn (1977), the causal relationship goes from money to aggregate demand and from aggregate demand to conflict and prices. Graphically,



Source: Rowthorn (1977).

One could argue that inflation arises only when conflict increases beyond a certain threshold (Rowthorn, 1977, p.227). But this argument raises even more serious methodological issues. If higher inflation rates are caused by more intense conflict, what drives conflict and how can we measure it? What levels of conflict can explain annual inflation rates above 100%? How do hyperinflations occur? Do they need hyper-conflict?[6]

[5] Rowthorn uses "target" instead of "desired" but conceptually the problem is the same (Rowthorn, 1977, pp.218-219).

[6] If π denotes inflation, in L&W's (p, 8) barter model $\pi \in (0, \infty)$. As the point-elasticity of demand approaches one, inflation approches infinity.

In other words, the hypothesis proposed by L&W and conflict theories of inflation generally is void of empirical content. Without it, L&W is not testable and therefore not refutable. Although the model is mathematically consistent, it is non-scientific in Popperian terms and has limited value as a guide for policymakers. Very old (and corked) wine in new bottles?

L&W's barter model fits into a broad menu of models that seek to explain inflation in a setting of staggered prices and conflict that follows a tradition that traces its roots to Rowthorn (1977) and the post-Keynesian literature. Readers unfamiliar with this literature may find useful the following taxonomy by Vernengo (2005).

Classification of Theories of Inflation

	Demand-pull	**Cost-push**
Exogenous Money	Salamanca School Quantity Theory of Money Keynes' Inflation Gap Phillips Curve Models	Marxists Neo-Chartalists
Endogenous Money	New-Malthusian Model Wicksell's Cumulative Process Real Business Cycle New Neoclassical Synthesis	Balance of Payments School Structuralists Scandinavian Model Post-Keynesians Inertialists

Source: Vernengo (2005, p. 22).

Rowthorn's conflict theory of inflation draws on the Marxist assumption that conflict between workers and capitalists is the dominant conflict in the economy and that class-consciousness prevails. This implicitly means that all other dimensions of conflict, not only economic (e.g., urban versus rural areas, creditors versus debtors, old economy versus new economy, tradable versus non-tradable, labor intensive versus capital intensive, central

banks versus treasury, etc.), but also non-economic (geographic, ethnic, religious, cultural, ideological, etc.) are irrelevant to explain inflation (or at least not relevant enough).

This monistic approach to conflict (itself derived from Marxist sociology) is the basis of the conflict theories of inflation to which L&W aim to make an original contribution. It is not only old wine in new bottles but also corked wine. As Schumpeter pointed out, in Marx "the exaggeration of the definiteness and importance of the dividing line between the capitalist class in that sense and the proletariat was surpassed only by the exaggeration of the antagonism between them. (1942, p. 19)" Given that Marx's economic theory has been long refuted and discredited, we find it ironic that Rowthorn rescued his sociology at the time Marxist sociologists had already abandoned it due to its empirical irrelevance (see for example Laclau & Mouffe, 1985). It is even more ironic that mainstream economists would try to revive such sociology to explain inflation using elegant mathematical models.

This is not to deny that conflict can have an impact on inflation or other economic variables. Even if one were to take a fiscalist approach to inflation a la Sargent (2013), "underneath the disorder in public finances one typically does find a political system unable to resolve conflicts that are at bottom struggles over the distribution of income." (Heymann and Leijonhufvud, 1955, p.55). On the other hand, conflict also plays an important role in politics. Populism has succeeded as a political strategy by promoting conflict between different groups. Moreover, the economic policies of left-wing populism have tended to generate high inflation.

We believe a monistic approach to conflict is theoretically and empirically limiting when trying to understand or explain inflation.

4. Empirical Relevance

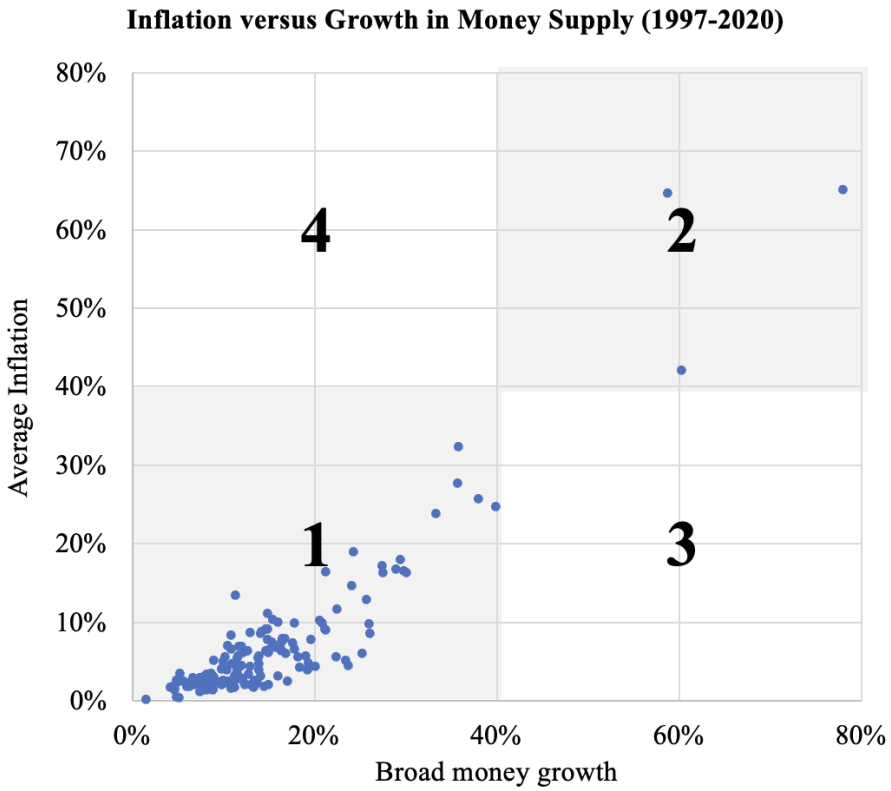
Conflict is a pervasive feature of any economic system (not just a capitalistic system as Rowthorn claimed). Resources are limited while needs are unlimited, even under socialism. Therefore, following L&W's logic, one would conclude that inflation would be ubiquitous. However, the evidence shows otherwise. During the period 2018-2022, 70% of the IMF's member countries had annual inflation rates below 6%.

L&W claim that a) there can be no inflation without conflict, b) that there can be inflation without money, c) money can also cause inflation. In other words, they propose a multicausal theory of inflation in which conflict plays the decisive role. How much can this approach contribute to explaining an observed inflation rate? What is the residual of an inflation phenomenon not explained by monetary factors? There are four possible relationships between inflation and the rate of growth of the money supply:

1. High inflation correlates with high rates of money growth.
2. Low inflation correlates with low rates of money growth.
3. Low inflation is correlated with high rates of money growth.
4. High inflation is correlated with low rates of money growth.

As can be seen in the following graph that includes data for 153 countries in the period 1997-2020, most observations in the real world fall into the first two categories. Countries that fall into (3) are rare (none in the graph above). Even more rare is to find countries in the fourth category, where models such as the one proposed by L&W could be useful. However, such a scenario is empirically irrelevant. A structuralist can at least claim his/her theory can explain

the other three scenarios by assuming money is endogenous. Structuralist theories still fall into areas 1) and 2).



Source: IMF and World Bank.

In algebraic terms, from *Inflation = Excess of money supply + Conflict + Other Causes*, we can state that *Inflation – Excess of money supply = Residual*. The data shows that *Residual* is not statistically significant. Either with active or passive money, most of observed inflations are explained by monetary causes (even if the initial cause is non-monetary as argued by the structuralist theory).

The whole exercise proposed by L&W reminds us of Caballero's (2010) warning of the dangers of "quantitative mathematical formalizations of a precise but largely irrelevant world."

5. Policy Prescriptions

L&W's model, and the conflict theory of inflation in general, has important policy implications. In line with Post-Keynesian literature, the underlying conflict is between capitalists and workers. It describes a world in which class struggle and class consciousness prevail. This reductionism is not coincidental, since Rowthorn (1977) explicitly recognized the influence of *Das Kapital* in the development of the conflict theory of inflation.

We do not claim, nor believe, that L&W are Marxists. But the conflict theory of inflation they promote with their paper has Marxists roots and implications that cannot be ignored because they can be used to justify policies that they do not explicitly advocate (or maybe even agree with).

Building a theory on Marxists assumptions adds other complications. Persistent inflation is not just an economic outcome, but a consequence of "social injustice." Such behavior implicitly calls not only for remedies but also penalties on the exploiters.

L&W conclude that if there is no conflict, there is no inflation. It follows logically, that if we want to reduce inflation, conflict must be reduced or eliminated. By definition, in their model the market cannot reduce conflict, only government can. What is the proper policy prescription under such circumstances? Mussolinian corporativism, in which the State mediates between labor and capital? Wage and price controls? Government sponsored accords between labor and corporate unions (what in Argentina is euphemistically known as a "mesa de concertación")? Nationalization of big business? A socialist community where factors of production are jointly owned by all workers?

L&W's "novel" approach to inflation will inevitably open a "Pandora box" full of nasty and counterproductive policy surprises.

6. Conclusions

L&W offer what at first sight seems an original contribution to the conflict theory of inflation that allows them to "reconcile" Post-Keynesianism with New Keynesianism.

We find that there is a contradiction in trying to explain inflation (a change in the price of money) with a model in which money (allegedly) does not exist. With its many flaws, we believe the structuralist theory with passive money offers a more compelling and coherent explanation of how changes in relative prices can lead to inflation. We find that the conflict hypothesis has little empirical relevance and that is questionable whether L&W's model is testable. Finally, the policy prescriptions that logically derive from this model (and conflict theory in general) include corporatism, wage and price controls and nationalizations. The evidence suggests that these policies increase inflation and aggravate conflict.

We do not minimize the importance of conflict in modern capitalistic society. Populism has successfully promoted conflict to advance its policies, which in the economic sphere have generally led to higher inflation. But the causal relationship is different from the one proposed by Rowthorn, Lavoie, L&W and others. Conflict can only lead to inflation with money, active or passive.

7. References

[1] Caballero, R. J. (2010). "Macroeconomics after the Crisis: Time to Deal with the Pretense-of-Knowledge Syndrome," *Journal of Economic Perspectives*, *24*(4), 85–102. https://doi.org/10.1257/jep.24.4.85

[2] Heymann, D. and Leijonhufvud, A. (1995). *High Inflation*. Oxford: Oxford University Press.

[3] Greenfield, R. L., and Yeager, L. B. (1983). "A Laissez-Faire Approach to Monetary Stability," *Journal of Money, Credit and Banking*, *15*(3), 302. https://doi.org/10.2307/1992481

[4] Laclau, E., and Mouffe, C. (1985). *Hegemony and socialist strategy: Towards a radical democratic politics*. London: Verso.

[5] Lavoie, M. (2014). *Post-Keynesian Economics: New Foundations*. Edward Elgar.

[6] Lavoie, M. and Rochon, L.P. (2023). "Olivier Blanchard and Inflation," *Monetary Policy Blog*, Available at https://medium.com/@monetarypolicyinstitute/olivier-blanchard-and-inflation-219f195125fe

[7] Lorenzoni, G., and Werning, I. (2023). "Inflation is Conflict," (No. w31099; p. w31099). National Bureau of Economic Research. https://doi.org/10.3386/w31099

[8] Olivera, J. H. (1960). "La Teoría no Monetaria de la Inflación," *El Trimestre Económico*, *27*(108(4)), 616–628.

[9] Olivera, J. H. (1970). "On Passive Money," *Journal of Political Economy*, *78* (4, Part 2), 805–814.

[10] Rowthorn, R. E. (1977). "Conflict, Inflation and Money," *Cambridge Journal of Economics*. https://doi.org/10.1093/oxfordjournals.cje.a035360

[11] Sargent, T. (2013). *Rational Expectations and Inflation*. Princeton: Princeton University Press.

[12] Schumpeter, J. A. (1942). *Capitalism, Socialism and Democracy* (Issue 2010). George Allen and Unwin.

[13] Vernengo, M. (2005). "Money and Inflation: A Taxonomy," (No. 2005–14; Working Paper). University of Utah: Department of Economics.

[14] White, L. H. (1999). *The Theory of Monetary Institutions*. Basil Blackwell.