

*The Redistributive Effects Of Inflation:
An Empirical Framework With Teaching Suggestions*

By Charles C. Fischer



*Charles C. Fischer, University Professor and Chair, Department of Economics,
Finance and Banking at Pittsburg State University, can be reached at
chuck@pittstate.edu.*

Abstract

This paper treats the redistributive effects of inflation. An empirical framework for key segments of the economy is set forth. The specification of the framework draws upon existing revenue and price indexes. An application of the framework for a particularly interesting inflationary period, the 1970s, is presented. Also, anti-inflation policy is discussed within the context of this framework. Finally, teaching suggestions are provided.

In teaching inflation to our students, a number of important issues arise for consideration: definition, measurement, resource allocation effects, impact on economic growth, redistributive effects, and the like. While these all are important issues, this article focuses on the redistributive effects of inflation. The reason for this focus is the desire to help students see how inflation impacts the economic well-being of certain groups, and how particular individuals can be both helped and hurt, depending on the different economic roles they have. For example, the framework may depict the following common scenarios:

- When appliance dealers pay more to manufacturers of appliances, dealers' costs increase at the same time manufacturers' revenues increase.
- When consumers pay more at the checkout stand, consumers' costs increase at the same time government revenues are enhanced by more sales taxes collected.

Further, these considerations open the door to a discussion of the distributive impacts of anti-inflation policy (see Herrendorf and Neumann, 2003), for those interested in pursuing this issue with their students.

The remainder of this article is organized as follows. The empirical framework is set forth, with an accompanying illustrative table (Table 1). Next, the framework is applied to the U.S. inflation experience of the 1970s (Table 2), a particularly interesting case example for teaching purposes. Then, this application is extended to consider public policy insights. Based on the framework and related discussion, several teaching suggestions are provided, as food for thought. The article ends with a brief summary and conclusions.

Empirical Framework

For the empirical framework depicting the redistributive effects of inflation, we shall focus on consumers, business and the federal government. Business will, in turn, be disaggregated into retailers, wholesalers and intermediate goods producers. This decomposition facilitates our analysis of inflation and is amenable to quantification using existing indexes. The indexes used and the relevant ratios are as follows (also see Table 1):

- For consumers (households)—the percentage change in the disposable personal income (DPI) per capita index as the numerator and the percentage change in the CPI as the denominator.
- For government—the percentage change in federal government revenues as the numerator and the percentage change in the Implicit Price Deflator as the denominator.
- For retailers—the percentage change in the CPI divided by the percentage change in the “finished goods” Producer Price Index (PPI).
- For wholesalers—the “finished goods” PPI in the numerator and the percentage change in “intermediate goods” PPI in the denominator.

- For manufacturers of intermediate goods—the percentage change in “intermediate goods” PPI in the numerator and the percentage change in “crude goods” PPI in the denominator.

The interpretation of the ratios for each segment is straightforward: a ratio greater than 1.0 indicates a positive redistributive effect (improvement in economic well-being), less than 1.0, a negative effect, and equal to 1.0 implies no effect (zero redistribution).

Table 1
Revenue-Price Relationships for Key Segments of Society

Segment	Revenue (Income)	Price (Costs)
Households	<i>DPI</i>	<i>CPI</i>
Government	<i>GR</i>	<i>IPD</i>
Retailers	<i>CPI</i>	<i>PPI</i> (fg)
Wholesalers	<i>PPI</i> (fg)	<i>PPI</i> (ig)
Intermediate goods producers	<i>PPI</i> (ig)	<i>PPI</i> (cg)

DPI - Disposable Personal Income, *PPI* (fg) - Producer Prices for
CPI - Consumer Price Index, Finished Goods,
GR - Government Revenues, *PPI* (ig) - Producer Prices for
IPD - Implicit Price Deflator, Intermediate Goods,
(ratio of nominal GNP to *PPI* (cg) - Producer Prices for
real GNP), Crude Goods.

Historical Insights

The empirical framework can be used to investigate the diverse effects of price changes on different sectors of the economy. A variety of past inflation scenarios can be identified and tied to actual economic events, such as the supply shocks of the 1970s (or hypothetical scenarios can be devised for teaching purposes). In fact, the decade of the 1970s stands out as a particularly interesting application (see Table 2). While we had “high” inflation years during the 1970s according to the CPI, with double-digit “stagflation” in 1974, the household sector did relatively well during this period, experiencing an adverse revenue-price relationship (ratio less than 1.0) in only two years—1974 (0.89) and 1977 (0.26). Further, while inflation was most serious during the 1970s from 1974 to 1975, and households had an “inflation problem” (i.e., ratio less than 1.0) in 1974 (but not in 1975--1.14), the biggest inflation problem for households during the 1970s occurred in 1977 (0.26) when inflation was actually moderating. In contrast, retailers fared quite well in 1977 (1.51). One group’s inflation problem can be to the

benefit of another group, especially when the former group's prices comprise the latter's revenue.

This case illustrates that some groups may do quite well during a particular period of price inflation and some may do quite poorly during the same period (and, likewise, for falling prices), depending on their revenue-price relationship. Also, the case demonstrates that adverse distributive effects for some segments do not necessarily coincide with periods in which inflation is relatively serious, but may actually arise as inflation moderates (see Rosenblum, 2003; Ball and Romer, 2003).

Table 2
Sample Table with Ratios (1970-77)

Year	Households ¹	Government ²	Retailers ³	Wholesalers ⁴	Manufacturers ⁵
1970	1.34	1.24	1.16	1.35	1.00
1971	1.76	0.66	1.05	1.10	1.50
1972	2.25	2.67	1.32	0.63	0.37
1973	2.09	2.22	1.88	0.31	0.28
1974	0.89	1.21	0.77	0.56	1.41
1975	1.14	0.69	0.60	1.26	21.36
1976	1.69	3.23	0.88	1.16	1.12
1977	0.26	0.33	1.51	0.65	1.50

1 % Δ DPI per capita / % Δ CPI

2 % Δ Revenues / % Δ Implicit Price Deflator

3 % Δ CPI / % Δ Finished Goods PPI

4 % Δ Finished Goods PPI / % Δ Intermediate Goods PPI

5 % Δ Intermediate Goods PPI / % Δ Crude Goods PPI

Public Policy Insights

The revenue-price framework provides public policy insights on combating inflation. Just as it can be used to identify the winners and losers of a particular period of inflation, it can shed light on who would likely benefit and who would not from public policy aimed at combating inflation. Returning to the 1970s, it is interesting that President Nixon's "New Economics" in 1971 (comprehensive wage and price controls) came at a time when only the Federal government was experiencing a negative redistribution (ratio less than 1.0) (see Table 2; Fischer, 1986; Shuettinger, 1980). We can see from Table 2 that the other sectors were doing quite well, with each experiencing a positive redistribution in their revenue-price relationship. Contrary to the often-heard lament of public officials at the time, inflation was not hurting everyone.

One can bring into the policy discussion of the framework such obstacles as institutional rigidities (e.g., fixed contracts), inflationary expectations, and supply-side constraints (e.g., energy shortages). For example, restrictive aggregate demand policies

may decrease revenue more than prices for some sectors, and thus lead to a decrease in economic well-being. This can be demonstrated, for example, by the case where persistent inflationary expectations in the household sector cause the CPI to be less responsive to restrictive aggregate demand policies than the DPI, resulting in an adverse redistribution (ratio less than 1.0) from this policy for this sector.

Thus, the empirical framework can be used to help students see the logic of why some are helped and some are hurt by inflation and, likewise, why fighting inflation creates winners and losers. This can be extended to a discussion of the political economy of anti-inflation policy and vested-interest group behavior. Those likely to be adversely affected (decrease in economic well-being) by anti-inflation policy have a vested interest in lobbying against it.

Teaching Suggestions

The framework for depicting the distributive effects of inflation, and related historical and policy applications, suggest possible teaching exercises. The suggestions below are arranged in order, beginning with the most basic level (least amount of class time required) and building from there. They are intended mainly as food for thought. The instructor probably would want to devise his or her own, as appropriate for the class (see Bach and Kelly, 1984; Quddus and Bussing-Burks, 1997; Becker, 1997; Mankiw, 1998; Holt, 1999; Taylor, 2000; Torz, 2000; Hansen, Salemi, and Siegfried, 2002).

1. Prepare a handout of Table 1 and discuss in class the interpretation of the ratios and how they can be used to demonstrate the distributive effects of inflation and how one group's inflation problem (indicated by a revenue-price ratio of less than 1.0) can be to another's benefit. This can be used to illustrate that not only are different **groups** affected differently by inflation, but that for an **individual** "the blade (of inflation) may cut both ways," such as in his or her dual roles as a consumer and a retailer. (This could be accomplished in about 15-20 minutes of class time.)
2. Extend the above by adding Table 2 to the discussion, so as to provide a concrete example of the redistributive effects (using the case provided here or some other period of interest). More than one period could be presented, for comparative purposes. As recent oil price increases work their way through the economy, it might be interesting to compare the current period with the earlier supply shocks of the 1970s. Such empirical exercises add "real life" to the discussion of inflation.
3. After discussing Table 1, have the students select a particular historical period, compute the ratios, and then describe the redistributive effects of that period's inflation (as a variant of #2, which gets the students more involved). The instructor could help students locate the data or, to make it a bit more challenging, ask students to do their own "data mining" on, say, the Internet.

4. A more challenging variation of #3 is to ask students how they would segment the economy and what indexes they would use for the assignment (rather than giving them Table 2). This would encourage students to think analytically about the problem.
5. As a topical application, ask students to use the framework to interpret such statements as the following: (1) “Inflation hurts those with fixed income,” (2) “Government can benefit from inflation,” and (3) “Workers can protect themselves from inflation by using COLA clauses in their contracts.” This exercise gets students involved in important economic issues facing key segments of the economy.
6. Ask students how, as a business manager, they would view the effects of inflation on their profits and how this would vary, depending on whether they were in the retail, wholesale or manufacturing business. An important aspect of this assignment is how inflation impacts product/service price versus cost of operation.
7. Instruct students to set up Tables 1 and 2 for another country. This would involve looking at income and price indexes in another country for key segments of its economy (here the Internet is quite helpful). Taking this exercise a bit further, one could have students compare Table 2 for the U.S. with their Table 2 for another country, for a particular period. The 1970s is a good candidate for this exercise, since the oil price shocks of that period rippled throughout the world. Another variant of this exercise is to ask students to do the above for only one key economic segment, so as to reduce the time and effort needed for this assignment.
8. Ask students to use the framework to evaluate the winners and losers of a particular anti-inflation policy. This presents “the other side of the coin,” in that groups which benefit from a particular inflation may be hurt by “corrective” governmental policy (e.g., income moderating more than prices).

These teaching suggestions illustrate that the instructor can choose to keep the discussion very basic and spend only a small amount of time on the subject or can add, by varying degree, to the assignment so as to challenge students to think more on their own and do much of the work themselves. Some side-benefits of the more challenging assignments are the development of problem-solving skills and increased proficiency in empirical research. Depending on the ability of the students, the more challenging applications do not necessarily require substantial more class time if done as an outside-class assignment, with minimum follow-up class discussion.

Summary and Conclusion

This article uses price and revenue/income indexes for key segments of the economy to help students understand the distributive effects of inflation (or deflation). The framework illustrates how different segments may be hurt or helped

by inflation, illustrating how one segment's inflation problem can be to another's benefit. It also sheds light on how individuals, in their different roles—as consumers, workers, managers—are differentially affected. The teaching suggestions which follow this discussion are aimed at helping students understand these issues in concrete terms, and getting them involved in the research, analysis and discussion of the problem. The exercises suggest ways in which the instructor can use the framework at a very basic level, simply illustrating the distributive impacts of inflation, or at higher levels of complexity and student participation, which may involve historical, comparative, and policy analyses. Recognizing the scarcity of class time, the instructor may want to pursue a three-stage approach: (1) explain Table 1 (as a handout) in class, (2) give the students a take-home exercise (perhaps, similar to one of those mentioned above) based on the handout (or stop after the first step), and (3) have some follow-up discussion in class. The exercises can be tailored to the amount of time one wishes to spend on the subject and the level/knowledge of students in the class (e.g., introductory, intermediate, honors).

References

- Bach, G. L. and Allen C. Kelley. 1984. "Improving the Teaching of Economics: Achievements and Aspirations." *American Economic Review* 74(2): 12-18.
- Ball, Laurence and David Romer. 2003. "Inflation and the informativeness of prices." *Journal of Money, Credit, & Banking* 35(2): 177-196.
- Becker, William E. 1997. "Teaching economics to undergraduates." *Journal of Economic Literature* 35(3): 1347-1373.
- Christiano, Lawrence J. and Terry J. Fitzgerald. 2003. "Inflation and monetary policy in the twentieth century." *Economic Perspectives* 27(1): 22-45.
- Hansen, W. Lee, Michael K. Salemi and John J. Siegfried. 2002. "Use it or lose it: Teaching literacy in the economics principles course." *American Economic Review* 92(2): 463-472.
- Herrendorf, Berthold and Manfred J. M. Neumann. 2003. "The political economy of inflation, labour market distortions and central bank independence." *Economic Journal* 113(484): 43-64.
- Holt, Charles A. 1999. "Teaching economics with classroom experiments: A symposium." *Southern Economic Journal* 65(3): 603-610.
- Mankiw, N. Gregory. 1998. "Teaching the principles of economics." *Eastern Economic Journal* 24(4): 519-524.
- Quddus, Munir and Marie Bussing-Burks. 1997. "Learning techniques in economics at the principles level." *American Economist* 41(2): 54-61.
- Rosenblum, Harvey. 2003. "Understanding inflation: Lessons from my central banking career." *Business Economics* 38(1): 7-16.
- Schuettinger, Robert L. 1980. "Wage-Price Controls: Forty Centuries of Solid Failure." *Nations Business* 68: 36-43.
- Taylor, John B. 2000. "Teaching modern macroeconomics at the principles level." *American Economic Review* 90(2): 90-94.
- Torz, Richard J. 2000. "Teaching Economics to Undergraduates: Alternatives to Chalk and Talk." *Eastern Economic Journal* 26(3): 374-375.
- Walsh, Carl E. 2002. "Teaching Inflation Targeting: An Analysis for Intermediate Macro." *Journal of Economic Education* 33(4): 333-346.



<http://www.westga.edu/~bquest/>

