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The Costs of Inflation Revisited

STEVEN HORWITZ sghorwitz@stlawu.edu
Department of Economics, St. Lawrence University, Canton, NY 13617

Abstract. Neoclassical treatments of inflation understate the costs associated with inflation, even at very low levels. A comparative institutions perspective that recognizes the epistemological properties of prices and the institutional process by which inflation takes place, reveals the costs of inflation to be both larger and more widespread than standard treatments suggest. This paper makes use of insights from Austrian economics, public choice theory, and the new institutional economics to argue that inflation imposes costs by undermining the coordinative properties of the price system. Not only are there the direct costs of increased economic error, but actors also divert resources away from direct want-satisfaction into attempts to either prevent or cope with the increased degree of uncertainty inflation imposes. These resource costs are best understood from a comparative institutions perspective, as traditional measures of economic well-being, such as GDP, cannot distinguish between exchanges that directly satisfy wants, and exchanges that are attempts to correct or prevent utility-diminishing activities. The analogy between these coping costs and rent-seeking behavior is explored. In addition, inflation imposes costs by undermining the coordinative properties of markets and inducing actors to, on the margin, prefer to seek wealth or allocate resources through the political process.

Key Words: inflation, Austrian school of economics, economic growth

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Introduction

As inflation rates have continued to fall both in the US and world-wide, economic analyses of inflation have shifted from focusing on the problems associated with high levels of inflation to exploring the costs and benefits of reducing inflation from its current low level toward zero. It is often argued that the benefits from squeezing out the last few percentage points of inflation might well be less than the costs of doing so, in terms of foregone output and/or employment along some Phillips curve. This literature has carefully attempted to specify the nature of those costs and benefits, as well as provide some indication of the empirical magnitudes involved.[1] These studies have come up with a variety of results, both theoretically and empirically, with no clear consensus on whether further attempts to reduce inflation are justified on welfare grounds.

The difficulty faced by these studies is that they center the costs of inflation around the way inflation taxes money balances, as has been the practice for many years (since Bailey (1956) at least). This perspective is overly narrow, and changes in the theoretical landscape of economics in the last couple of decades make a re-examination of the costs of inflation a worthwhile undertaking. In particular, the maturation of public choice economics, the growth of New Institutionalism, and the revival of the Austrian school have all prompted more careful analyses of the operation of both market and political institutions

and the interaction between them. The New Institutionalists and the Austrians have also been skeptical of equilibrium theory's ability to capture important aspects of economic interaction.

In this paper, elements of all three approaches will be combined to explore the costs of inflation from a comparative institutions perspective. What this paper offers is an integration and synthesis of a number of arguments made by economists working in the three schools of thought noted above. The paper suggests that the costs of inflation may be much greater, and longer term, than those captured in standard institutionless analyses.[2] Although it offers only a theoretical framework for understanding the costs of inflation, and not empirical estimates, the paper does generate some hypotheses that could be emprically tested and strongly suggests that the standard accounting of the costs of inflation understates the damage it can do, even in low or moderate doses.[3]

The Standard View

Most of the literature on the costs of inflation takes its starting point from the definition of inflation as an ongoing increase in the price level. The rising price level creates four potential problems in the standard analysis, the severity of which will depend largely on whether the inflation is anticipated or not. In discussing the four problems below, we will assume the inflation is unanticipated.

The first, and perhaps most obvious, problem is that inflation reduces the value of money, and therefore amounts to a tax on money balances.[4] As a result, actors are led to hold lower real money balances than they would in the absence of inflation, creating a sub-optimal outcome. Various studies have attempted to quantify this inflation-generated welfare loss by computing the money demand function and measuring the area underneath the curve that is eaten away by inflation. In addition, a fairly rapid fall in the value of money will impose a further cost on money-users. In struggling to keep up with rising prices, money users may have to make additional trips to the bank to replenish their desired nominal money balances. Traditionally referred to as "shoe-leather" costs, reflecting more walks to the bank, we might more broadly term these as "banking-transaction" costs. These trips to the bank would not be necessary in the absence of the inflation, and thus represent a cost imposed by it.

A second cost of inflation, in the standard view, is the redistribution of wealth from creditors to debtors (Alchian and Kessel 1959). If the increase in the price level is unanticipated, debtors will be paying back their nominally-denominated debts in real dollars that are worth progressively less. Unanticipated inflation reduces the burden on debtors and harms creditors. One might object that this is not really a "cost" of inflation, because it amounts to a transfer, not a net loss. However, ongoing inflation (particularly if rates are variable and unpredictable) may well cause lenders to reduce the overall amount of credit they supply, which would represent a real loss in comparison to an economy in monetary equilibrium.

Inflation also forces sellers to expend additional resources in order to more frequently change prices.[5] These so-called "menu costs" will vary directly with changes in the rate of inflation. The more quickly prices are rising, the more often sellers will have to adjust prices. The time spent in remarking inventory, or reprogramming computers, reflects a cost

imposed by inflation. Note that these costs exist even if inflation is perfectly anticipated. Instantly and correctly adjusting prices from their pre-inflation equilibrium values to their post-inflation equilibrium values still involves resource costs.

The first three problems are all related to changes in the general level of prices. The fourth problem is the way in which changes in the price *level* might affect the distribution of *relative* prices across the economy. If inflation only affected nominal prices, leaving relative prices alone, it would still create all of the above costs. However, if inflation also affects relative prices, then, according to the standard literature, resources will be misallocated because some number of relative prices will no longer be at their equilibrium values. One way to make this distinction is to say that the first three problems might simply put the economy at a new equilibrium position with lower overall welfare. The fourth problem, though, can cause the economy to be out of equilibrium, in addition to any overall losses of welfare.

The literature offers a variety of explanations for how relative prices might be affected by inflation.[6] Rather than comprehensively review each one, the focus below will be on two of the more common relative price stories. The first emerges from menu costs. If prices cannot be instantaneously changed as the money supply rises, due to the costs involved in making changes and because actors must recognize the need to make the change, then prices will be changed at discrete intervals. The nature of the particular menu costs, plus other institutional factors in the marketplace, will lead to differences in when firms make price changes. At any given time during inflation, some prices will have adjusted upward while others will have not (Caplin and Spulber 1987). As a result, at any given moment in time, the vector of relative prices will not be the equilibrium one. The consequence of this variability in relative prices is resource misallocation as existing market prices do not correspond to their equilibrium values. On this view, inflation reduces economic welfare by inducing resource misallocation through relative price effects.

The second general category of relative price effect explanations is a version of the signal extraction problem. During unanticipated inflations, agents have difficulty distinguishing changes in the average level of prices from changes in the relative price of the particular good they supply. For apple producers, an increase in the price of apples might reflect an inflationary increase in aggregate demand, or a substitution away from other goods into apples, or both. To the extent that agents misinterpret a rise in the general price level as an increase in their relative price, and make supply adjustments as a result, the structure of relative prices will be changed inappropriately compared to the underlying equilibrium.[7] In addition, agents will have to sort out how much of the price change is permanent and how much of it is temporary. Again, their degree of error will lead to relative price effects, and with the structure of relative prices deviating from equilibrium, resource misallocation and economic waste will result.

These costs all come into play when inflation is not anticipated. When it is anticipated, the costs are substantially less in the standard view. What remain are the shoe-leather and menu costs. Even if inflation is fully anticipated, agents must still make more trips to the bank to keep their nominal balances in line with the rising price level. Prices must still be changed as well, even if the inflation is anticipated. Firms will still have to remark goods or reprogram computers as the price level rises.

As for the other costs, if one accepts the mainstream view that in the long-run all systematic inflation will be anticipated, then the tax on money balances will be reduced as, given enough time, agents will exploit available substitutes for money, leading to a fall in money holdings. In a process analogous to the reaction to any tax, at higher rates of taxation (inflation) users of the good will find substitutes and lower the base off of which the tax is raised, possibly lowering the total amount of revenue (seignorage) raised by the tax.[8] Dowd (1994) concludes that the welfare losses due to anticipated inflation are nonetheless substantial due to the behavioral changes induced by the increased tax on money holdings.

According to the standard perspective on inflation, if inflation is fully anticipated the associated costs will be lower than when it is unanticipated. In addition, the costs will be even higher when the inflation rate is both highly variable and unanticipated. To the extent that such variations create difficulties in forming accurate expectations about inflation, those variations, rather than the absolute level of inflation, will be the more important predictor of the associated welfare losses.

The Inflation Process and Relative Price Effects

An alternative theoretical framework for understanding the inflation process and its effects on economic welfare emerges out of several themes in the work of the three schools of thought noted in the opening paragraphs. First, is the New Institutionalist insight that economic institutions serve to coordinate human action under conditions of uncertainty and disequilibrium. Second, is the Austrian view that prices are the central institution for achieving market coordination and that they do so by serving as surrogates for more detailed human knowledge and as signals for prompting the discovery process of the market. Third, is the public choice conception of the political process as one where elected politicians, voters, and bureaucrats attempt to enhance their wealth, status, and/or power through self-interested exchange. These perspectives allow us to examine more critically the standard view of the costs of inflation.

Many treatments of relative price effects hold to the assumption that increases in the money supply enter the economy evenly across money holders. In Friedman's classic image, it is as if a helicopter simply spread the new money proportionately to money-holding agents.[9] Even if the money enters agents' holdings in this manner, the signal extraction problem (if the inflation is unanticipated) or menu costs will still generate relative price effects. The problem with this assumption is that it ignores important features of economic reality, and in so doing, misses a more important and pervasive conception of relative price effects.

In fact, excess supplies of money enter the market at specific times and in specific places depending on the particular actions taken by the monetary and fiscal authorities. Empirically, if additions to the money supply are made through open market operations, new reserves arrive at those banks who either sell securities directly to the Fed, or to those banks who have the accounts of security dealers who participate in FOMC transactions. Specific banks receive the new money first, and their decisions about what loans they will then make, and the spending decisions of the recipients of those loans, will be the proximate causes of a first round of relative price effects. Because the first recipients of the excess money

will spend it on specific goods, the prices of those specific goods will rise first. The sellers of those goods will see additions to their money holdings, which, assuming no change in money demand, will be spent on other specific goods, whose prices will rise. On this more institutionally-rich view of the inflation process, relative price effects are not the result of confusing a general price increase with a relative price increase, or of the costs involved in changing prices (though these do exist), rather they are *inherent in the very institutional processes by which inflationary increases in the money supply take place*.

This point is even clearer when we examine the political motivations behind inflation. As has been argued for centuries, governments that print money create seignorage revenue for themselves, making inflation an alternative to other forms of taxation. However, inflation can do more than just create general benefits for political actors. As Richard Wagner (1980:11) argues, "politicians gain very little through policies that affect all voters equally, rather, political action is concerned with achieving desired changes in the structure of prices. Any change in the level of prices that may happen to result because of a resort to money creation is an incidental by-product of the effort to change the structure of prices." By altering relative prices, political actors can confer benefits on those voters whose support is most needed. Simply raising all prices equally would bring in the general benefit of seignorage, but would forgo the potential benefits from inflation's differential effects on various groups. Wagner (1977:401) makes this point the following way:

> Such a nondiscriminatory increase in aggregate spending as would result from a helicopter drop would confer benefits on such nonmarginal voters as strong supporters of both the incumbent party and the opposition. This type of policy would yield less political support than one that is designed to modify the structure of relative prices, for this latter type of policy would make it possible to concentrate the benefits on voters who are believed to be marginal in the forthcoming election.

Certainly elected politicians cannot precisely control the paths that excess supplies of money take through the economy. However, they can influence whether the new money comes in through additions to bank reserves, which, by lowering market rates of interest, might help those voters who require more indebtedness (agriculture or corporate borrowers, perhaps). Moreover, if inflation is being used to finance deficit spending, one can argue that the politicians can direct the additional spending toward specific interest groups or voters. Not only are relative price effects inherent in even politically-neutral money supply processes, the existence of political benefits from inflation creates additional incentives to supply money in amounts and ways that affect relative prices.

This understanding of the relative price effects of inflation raises suggests that the standard distinction between anticipated and unanticipated inflation is problematic (Laidler 1990:51). That distinction assumes that if one knows that the monetary authority intends a five percent increase in the money supply, then the price level *and the price of one's own goods or services* will also rise by five percent. Note the shift from the generally correct proposition that increases in the money supply will proportionately affect the *overall* level of prices, to the claim that each and every price will be affected by that amount, if the money supply increase is expected. When one drops the assumption that money enters the economy in proportion to the existing holdings of money users, then the leap from what is true of the

average to what is true of individual prices collapses. Even if the amount of the money supply increase is known, one would have to know also the precise path the additional money would be taking to know how the price of one's own good or service will be affected by inflation.[10]

For example, it is conceivable that if a particular good is highly demanded by those who are disproportionately favored by the inflation, then we would expect a rather significant rise in that good's price, particularly relative to those goods not demanded by the same people. Even after a one-shot inflation worked its way through, there would be no assurance that any given price (and surely not every price) would have increased by precisely the percentage change in the money supply.[11] Although knowing the money supply increase would provide the best guess at one's own price change (since it equals the average price level effect), there is no reason to believe that it would be correct in any specific number of particular cases. To argue that anticipated inflations would be neutral because individuals would know the effect on the general price level is only valid if one assumes that the effect on each and every price is the same, and is equal to the average effect. Given how unlikely that outcome is, even anticipated inflation (in the sense of knowing the behavior of the monetary authority) will still generate relative price effects. In the discussion to follow, we will not distinguish between anticipated and unanticipated inflations, other than to note that the costs of inflation will be somewhat greater in unanticipated inflations, but not by enough to justify distinct treatment.

Relative Price Effects in Disequilibrium

In the standard view of inflation, relative price effects involve costs because they throw the economy out of equilibrium. If an economy in equilibrium is subjected to inflation, and that inflation involves no relative price effects, then the new higher nominal prices would still be equilibrium prices relative to each other. However, if relative price effects occur, the vector of prices will no longer be an equilibrium one, assuming no changes in underlying tastes, technologies, or resources. The costs engendered by relative price effects can be measured by the degree of deviation from equilibrium the inflation causes (e.g., Cukierman 1982). The quantities supplied and demanded will differ in the post-inflation economy from where they were in the pre-inflation economy, without any change in the real factors affecting them. The inflation, and only the inflation, is causing these disequilibrium prices.

This argument is consistent with the now generally accepted proposition that prices provide information to market agents. This insight is usually credited to Hayek (1945) and has spawned a whole literature on the informational efficiency of prices. On this view, inflation makes price signals informationally inefficient by injecting "noise" into the otherwise fully-informative equilibrium price. This noise is what creates the signal-extraction problem and the resulting relative price effects and resource misallocation.

However, a different interpretation of the Hayek argument suggests that he was more concerned with the informational properties of *disequilibrium* prices than the static informational efficiency of prices (Thomsen 1992, Kirzner 1992a). From a disequilibrium perspective, prices act as surrogates not for the perfect information agents have in equilibrium, but for the inarticulate and frequently contradictory information generated by a

disequilibrium market process. In this Austrian conception of the market process: (1) individuals must cope with the uncertainty of the future and (2) calculation in terms of money prices is the primary way in which they do so. The degree of order observed in real world disequilibria is substantially the result of entrepreneurs and consumers making use of the imperfect information embodied in the market price system. The ability to use disequilibrium money prices to calculate the potential and realized profitability of various production plans, without needing to directly access the knowledge of actors on both sides of the market, is the real informational accomplishment of market prices.

Outside of equilibrium, prices provide information that enables actors to assess what they have done, what they might do, and create the conditions for the discovery of heretofore unknown opportunities. To the extent prices are free to move in response to changes in the underlying variables, they will enhance economic coordination.[12] When prices are divorced from those underlying variables, economic coordination will be diminished, not just in the static sense of deviations from the current equilibrium, but in a broader sense of mistaken decisions and opportunities left undiscovered. The greatest damage done by inflation is precisely this separation of the induced variable of price from the underlying variables of tastes, technologies, and resources.

Boettke (1990:130–131) argues that there are three distinct knowledge-producing functions of prices: their *ex ante*, *ex post*, and discovery functions. The *ex ante* function of prices is to help inform actors of the possible outcomes of various plans they might undertake. We use current prices to help estimate the profitability of possible plans, and in this function, they are forward-looking. The *ex post* role of prices is to tell us at the completion of our plan whether it was successful or not by comparing our realized output price with the historical prices of the inputs we used. This is the traditional notion of profit and loss accounting, and is essentially backward-looking.[13] The third function of prices is to facilitate market discoveries. Where the first two functions, especially the first, assume the actor has some end in mind and is computing the best way of achieving that end, this function of prices is to tap into the alertness of actors to new possibilities heretofore unnoticed (Kirzner 1973). For example, prices enable actors to see potential differences between the sum of the prices of a set of inputs and their estimate of the price of an output those inputs could produce. The existence of those market prices make such acts of entrepreneurial alertness more likely by providing information that can prompt our capacity for discovery.

The relative price effects generated by inflation interfere with all three functions of prices. The forward-looking informational role of prices is weakened by the influences coming from the monetary side. Prices become less reliable as informational guides as to future actions. By the same token, prices lose effectiveness as indicators of past actions. This problem is captured by long-standing arguments about the difficulty faced by accountants during inflation. If inputs are priced at historical cost, and outputs sold at current inflation-affected prices, then the profitability of the firm will be overstated.[14] As prices become less tied to the underlying variables, they also perform their discovery function less desirably. Market actors will become more skeptical of the reliability of existing market prices, and will be less likely to be alert to the sorts of price differentials that would otherwise prompt market discoveries.

The real damage done by relative price effects is that they undermine the process of monetary calculation that is central to entrepreneurial activity and discovery in a disequilibrium

market process. It is not just a matter of some prices deviating from their equilibrium values, but a more pervasive weakening of the price system as a social institution necessary for the coordination of economic activities. If relative price effects simply refer to prices being out of equilibrium, then the cessation of inflation would allow the standard neoclassical equilibrium story to resume. On a more Austrian view, the effects of inflation on relative prices may create effects that linger on for long periods of time, creating costs that are irretrievable once the inflation stops. Those effects are not limited to simply economic inefficiencies, but also include major changes in the institutional structure of both political and economic processes.

A Comparative Institutions View of the Costs of Inflation

The major costs of inflation are reflected in the ways in which inflation diverts resources away from the direct satisfaction of human wants toward activities that do not directly satisfy wants and would not take place in monetary equilibrium. These diversions can be viewed as economic waste because, in monetary equilibrium, those resources *could* be used for direct want-satisfaction. Richard Wagner (1980:30) sums this up:

> Wastage of what could have been produced to satisfy human needs, had the monetary expansion not discoordinated individual plans, is also a cost of that expansion....Different institutional orders will entail different degrees of waste, and an "ideal" institutional order will entail the natural rate of waste.

Tullock (1967:44) describes rent-seeking expenditures in a similar way, "These expenditures . . . are purely wasteful from the standpoint of society as a whole; they are spent not in increasing wealth, but in attempts to transfer or resist transfer of wealth." Notice that both Wagner's and Tullock's conceptions of waste are from a comparative institutions perspective. In both cases, expenditures are "wasted" because we can imagine a feasible institutional order where such expenditures would not "need" to occur and the overall level of wealth would thereby be higher. If such an order is feasible to achieve at the moment of choice among institutions or policies, then the move to the more wasteful set of institutions can be seen as welfare-diminishing.[15]

What is true of different institutional orders will also be true of different monetary regimes, and different inflation rates under a given monetary regime. One important aspect of this concept of economic waste is that it will not be picked up by conventional measures of GNP or GDP. Wagner (1980:31) makes this point: "The way that [national income] accounts are constructed, resources devoted to the correction of error are valued equivalently with resources devoted to other production." In other words, the payments for final goods and services associated with undoing or preventing the damage of inflation (discussed below as "coping costs") are counted in GDP and employment statistics, even though they represent a loss in want-satisfaction compared to an inflation-free economy. Many of the costs of inflation to be discussed below will not be reflected in lower GDP figures, even in economies subject to significant levels of inflation.[16] Because GDP figures do not make the distinction pointed to by Wagner, they tend to understate the costs of inflation, which is to say that they overstate the health of inflation-ridden economies.[17]

Capital, Irretrievable Costs, and Waste

The first way in which a comparative institutions approach enables us to see additional costs of inflation is an extension of the standard signal-extraction problem. The central issue is confusion between the temporary effects of inflation and the longer-term underlying elements of supply and demand. Rather than being limited to distortions of final goods prices that might result from mistakenly believing that the temporary effects of inflation are permanent, the discussion here extends the results of such misperceptions to the structure of capital and labor.

In the disequilibrium market process we have been examining, the central function of the entrepreneur is to combine various inputs (capital and labor) in order to produce the output he believes consumers desire. As noted above, the ability to calculate in terms of money prices provides the entrepreneur with usable, albeit imperfect, information about what output to produce and what inputs to use to produce it. As inflation-induced changes in relative prices occur, different final goods will appear to be profitable to produce, and different inputs will appear more cost-effective. More entrepreneurs will be drawn into producing those goods whose relative prices have risen, and these new producers will require new inputs in these lines of production. To do so, capital and labor that are active in other production processes will have to be bid away and reconfigured to produce the good in question. Idle capital and labor brought into activity will likely also require some sort of refitting or retraining to be useful in the production processes now perceived to be needed.

Austrian capital theory, especially that of Lachmann (1947 and 1978), has long stressed the importance of "complementarity" and "substitution" in the capital structure. If capital goods (and labor) are heterogeneous in their uses, they are also relatively (although not perfectly) specific to particular uses, what Lachmann calls "multiple specificity." Any given capital good (and labor) will have a limited range of possible uses to which it can be put, with some more valuable (in the eyes of the owner) than others. Since this is true of all capital goods, any production process that requires more than one input will have to be concerned with whether the various specific capital goods being used will be complementary to each other.

Because capital goods are not completely specific, i.e., they have multiple uses, entrepreneurs must be concerned with issues of substitution. Not only do individual goods have multiple uses, most outputs can be produced in a (finite) number of different ways. Substitution, therefore, "is a phenomenon of change the need for which arises whenever something has gone wrong with a prior plan" (Lachmann 1947:200). If capital gains and losses indicate to the owner that the existing production process has not been successful, the owner is faced with the need to rethink the plan. The entrepreneur must now consider issues of substitution: in what other ways can the output be produced?

The relative price effects of inflation will generate capital gains and losses that lead entrepreneurs to reconsider their production plans. Bringing in new capital and labor that are complementary to existing inputs will mean reconfiguring machines and retraining labor from their previous uses to better fit into the apparently more profitable production plans. This process of making newly acquired capital and labor better complement existing inputs is costly and if these changes turn out to be mistaken, i.e., if the relative price change is

just temporary, those costs are not completely retrievable. The resources devoted to refitting capital and retraining labor in ways that are later revealed to be mistaken are costs of inflation.[18]

One response to this argument might be that erroneous refitting and retraining takes place all of the time in inflation-free markets simply due to the uncertainty inherent in the discovery process of the market, so entrepreneurs bear irretrievable costs quite frequently. Although this is clearly correct, it fails to distinguish between sources of uncertainty inherent in market processes and exogenous sources that are avoidable by better policy. Economies with positive rates of inflation create an additional epistemic burden for entrepreneurs, as they must sort out not only the market behavior they have always had to, but also the effects of the inflation.[19] Inflation means that rather than just relying on their knowledge of *market* behavior, entrepreneurs also have to make use of some sort of knowledge about the likely path and duration of the inflation. The relevant knowledge here is not about the effects of inflation only on *existing* prices (as in the standard story) but more its more important effects on *future* prices. In other words, forming an accurate expectation of the Federal Reserve's current policy is not enough. Entrepreneurs would also have to form expectations about its future policies, and their likely effects, to be able to form accurate expectations of the future constellation of prices. This additional epistemic burden reduces the reliability of monetary calculation as a guide for production decisions and contributes to a capital structure that will be more error-ridden than would be the case absent inflation.

Inflation also changes the *kind* of knowledge entrepreneurs must have. Assume an economy that has historically been inflation-free. Entrepreneurs have built up years of contextual market experience that enables them to formulate their expectations of future prices in order to make capital-relevant decisions. If inflation appears, accurately envisioning the future constellation of prices now requires the kind of knowledge they already have, *plus* a new kind of knowledge about the likely behavior of the monetary authority *and* the possible effects of its policies. There is no reason to expect that this kind of knowledge can be easily acquired by existing entrepreneurs who have invested in acquiring other kinds of knowledge. At the onset of a period of inflation, monetary calculation will be undermined by this shift in the kind of knowledge necessary for choosing profitable production processes. The obvious effect of this shift is that actors will now begin to invest in acquiring more of the new kind of knowledge. In the meantime, however, they are likely to make more errors with respect to capital decisions than they would in monetary equilibrium, and some portion of the costs of those errors will be irretrievable, thus constituting waste from a comparative institutions perspective.

Coping Costs and Diverted Resources

One large set of costs imposed by inflation that are not well captured in standard models, are what might be termed "coping costs." The existence (or possibility) of inflation induces people to expend resources protecting themselves against its effects: "societal resources are channeled away from productive activities toward inflation-hedging activities" (Pakko 1998:37).[20] These activities include what have traditionally been called "shoe-leather" costs but go much broader. They may be as simple and cheap as reading the newspaper to

learn about Fed policy or the current price level, or as complex and expensive as finding and paying a financial expert to manage one's personal or business assets. All of the expenditures induced by inflation that are oriented toward coping with inflation are wasteful in comparison to an economy in monetary equilibrium. In the latter, those same resources could be used to satisfy human wants directly.

One example of such costs would be those associated with negotiating wage contracts in an inflationary regime. During even small inflations, we would expect both labor and management to devote resources to figuring the inflation rate in addition to the marginal increase in negotiation time and resources required to agree upon an appropriate cost-of-living adjustment. Accountants would be faced with similar problems. To the extent that accountants spend additional time trying to adjust their work to compensate for the effects of inflation, they are wasting resources.

The two broadest forms of coping costs are producer and consumer portfolio adjustments. On the producer side, firms are more likely to spend resources hiring financial experts to better manage their portfolios in the face of inflation. The opportunity cost of hiring people in finance is the output that could have been produced by hiring people directly involved with the production process. As Leijonhufvud (1981:248) summarizes these problems: "In short, being good at 'real' productive activities—being competitive in the ordinary sense—no longer has the same priority. Playing the inflation right is vital." In the absence of inflation, the firm could have both a well-performing asset portfolio *and* the output of those hired for direct production. Looking at employment in the finance, insurance, and real estate sector can provide empirical confirmation for these costs, if the fraction of the labor force employed there rises with inflation. Pakko (1998:42) found that from 1965 until the the mid-1980s, as inflation continued to rise in the US, the fraction of the labor force employed in those sectors rose from 4.6 percent to just over 6.7 percent.[21]

Consumers might also be more likely to hire financial consultants to help in protecting their portfolios against inflation. In monetary equilibrium, those resources could have been used to purchase other goods or services while still maintaining a desired portfolio.[22] Calling these expenditures wasteful is not to say that they are irrational *given the existence of inflation*. If inflation is taking place, then such decisions are quite rational. Recall that our definition of waste was a comparative institutions concept. The claim of waste rests on the existence of an alternative set of institutions where those resources would be used for directly satisfying wants. What is rational in the world of the second-best, given the historical path that included inflation, might still be seen as wasteful from the first-best world where inflation was absent.

These expenditures are also wasted *whether or not the financial experts are successful*. Certainly if one hires a financial expert who gives bad advice, it is easy to make the *ex post* claim that the expenditures were wasted. However, in the case at hand, in a comparative institutions context, the resources are wasted *ex ante* even if the expert does a perfect job in adjusting the firm's portfolio. Had the inflation not taken place, no additional expenditures on financial advice would have been necessary. The wastage might be compounded by mistaken financial expertise, but even perfect advice represents wasted resources.

The relationship between coping costs and economic waste can be seen as analogous to the idea of rent-seeking that emerged from Tullock's (1967) work on the welfare costs

of monopolies, tariffs, and theft.[23] Tullock's discussion of theft is the most analogous to inflation. In the same way that living in a crime-prone area will induce crime-protection measures by citizens, so does inflation induce inflation-protection measures by producers and consumers. Homeowners who buy additional dead-bolt locks or security systems are acting rationally given the level of crime in the area. Nonetheless, these resources are wasted from a comparative institutions perspective as we can conceive of an alternative institutional arrangement where the crime rate is lower and where the resources spent on crime-protection and crime-commission could be used on other goods and services. As with the coping costs of inflation, these Tullock expenditures are no less wasted if they ultimately prove successful. The concept of waste is relevant when comparing institutional structures, not when assessing the success of individual actions.

These coping costs are difficult to capture in static models that focus on how inflation might disturb relative prices from their equilibrium values or on how inflation affects money balances or menu costs. This is not unlike the way in which Tullock expenditures are invisible to those who are looking for the costs of monopoly in Harberger triangles. To get a sense for the pervasiveness of these important costs of inflation, a comparative institutions approach is very useful. That same approach can be used to explore an even larger-scale effect of inflation: the increased politicization of economic activity.

Relative Costs and the Choice Between Markets and Politics

In his well-known article on the theory of the firm, Coase (1937) argued that the choice between markets and firms as coordination processes will depend on the relative costs of each. If market costs (such as negotiating and monitoring contracts) are less than firm costs (administration and bureaucracy), then the market will be chosen, and vice versa. We can extend that framework to the choice between markets and politics as means for individuals to enhance their wealth.[24] From the individual's perspective either process holds the promise of enhancing his wealth.[25] Which process any given individual will make use of will depend on the costs of using each. Because inflation disrupts the reliability of market prices in the ways discussed above, it raises the relative cost of using the market to acquire wealth, and will induce wealth-seekers on the margin to switch to the political process. This shift in resource allocation from markets to politics entails a number of costs that can be explored from a comparative institutions perspective.[26]

The most fundamental way this allocative shift takes place is when individuals are frustrated by inflation-induced market outcomes and perceive that the political process is the appropriate way to remedy the situation. The disruption of relative prices makes market entrepreneurship more difficult by undermining the monetary calculation process needed to allocate resources with any degree of rationality. However, *political* entrepreneurship may become more attractive, with the result that people turn to the political process for relief. However, as Leijonhufvud (1981:250, emphasis in original) argues, the public's response to inflation is different from other problems:

> If our political institutions allow unemployment to grow, the feedback will be in unmistakable clear text: You'd better do something about unemployment or else...!

> If they err on the side of inflation, there will be widespread and general complaining about rising prices to be sure, but that diffuse message is quite drowned in the rising babble of *specific* demands and *concrete* proposals from identifiable interest groups—to compensate *me*, to regulate *him*, to control x's prices, and to tax y's "excess profits," etc., etc.

The "babble" generated by inflation, resulting from the public's inability to connect the effects with the cause, creates opportunities for political actors to expand their influence.

If the demands being made of the political process are quite specific, as with unemployment, the scope for discriminating among possible programs and beneficiaries is very narrow. Politicians must respond to the specific demand. However, the chaotic babble of responses during inflation allows legislators to *selectively* quiet the babbling by targeting programs and policies at those babblers who are the most valuable politically. As noted earlier, politicians want the freedom to confer benefits on marginal groups. The varied demands made of them during inflations provide that freedom. The political benefits of inflation occur not just due to its discriminatory impact at its onset, but also from the induced increase in the quantity of future discriminatory programs being demanded.

The process does not stop here however. Once these programs are created in response to the diverse effects of inflation, further consequences follow. As with the creation of any government program, there is now a class of beneficiaries who will be unwilling to give up those benefits. Programs created in response to inflation will create further opportunities for rent-seeking and rent-protecting behavior as those programs come up for periodic renewal or review. In addition, by satisfying the political demands of one group, two other problems arise. First, other groups will now have a greater expectation of their demands being satisfied and will likely increase their rent-seeking expenditures as a result.[27] This will be particularly true the more that the inflation undermines market price signals, rendering market processes more difficult as a way to enhance one's wealth. Second, the existence of one set of government programs may well cause further undesirable unintended consequences in the market process, leading to not only intensified demands on the part of pre-existing rent-seekers, but new sets of demands on the political process by the victims of the new programs.

Inflation is thus an excellent example of the dynamic of interventionism identified by Mises (1966:716ff; see also Ikeda 1997). Once inflation occurs, it sets off a sequence of events that leads to progressively more government involvement in the market process. It is also worth noting that this perspective suggests that the relationship between inflation and budget deficits runs both ways. Not only can deficits be a source of inflation, but continuing inflation that creates additional demands on the political process can lead to higher levels of spending and larger deficits. Most empirical studies of the relationship between inflation and budget deficits have assumed the causality runs only one way. Of course, all of the activity associated with the inflation-intervention cycle involves comparative institutional waste.

Even if the narrowly economic effects of inflation are largely in the short run, the political consequences, and their associated costs in terms of wasted resources, are likely to continue into the long run. If regulatory or spending programs are explicitly adopted as short run responses, that does not guarantee that they will be short-lived. As public choice theory has

long argued, any program that creates concentrated benefits and dispersed costs will be a political success, regardless of its stated goals or time-span. As long as the beneficiaries have reason to rent-seek or rent-protect to keep the program and as long as the per capita costs are low enough to not justify action by the rest of the public, the program will continue to find support. This process has been well-documented in Robert Higgs' (1987) study of the growth of the US government in the 20th century. Many current programs, policies, and whole agencies and departments that arose as "temporary" responses to specific short-run crises have lingered long after their original justification expired.

This general pattern of movement from markets to politics as the preferred process for seeking wealth is a large and fundamental cost of inflation. As inflation disrupts monetary calculation in the market and induces this shift toward rent-seeking activities, it generates economic waste and increases the politicization of resource allocation. If one accepts the general proposition that markets are superior to government in efficiently allocating resources, then this shift represents a pervasive cost of inflation. Laidler and Rowe (1980:102) argue that:

> [W]e would expect the consequences of [even] anticipated inflation to be not just an increase in the consumption of shoe-leather, but an adaptation of the social order away from money and markets toward a greater reliance on one form or another of command organization.

Not only are the rent-seeking activities wasteful compared to an alternative set of institutions, but the programs and regulations created in response to that activity fail to coordinate economic action as well as would the set of institutions generated under monetary equilibrium. It is precisely this consequence of inflation that is overlooked in standard approaches that fail to explore the epistemic role of prices sufficiently and more or less ignore the institutional framework within which economic activity occurs.[28]

Suggestions for Further Research and Conclusion

As noted at the outset, this paper has made few claims about the empirical magnitude of its broader conception of the costs of inflation. However, the argument laid out above does seem to generate some implications that could be emprically tested, either by qualitative or econometric studies. Further research could explore the relationship between inflation and rent-seeking activity to see if the reduced reliability of markets induces more political entrepreneurship. The same consideration about the reduced reliability of markets suggests that mergers and other forms of integration among firms might well increase during inflation. Another implication is that entrepreneurs should prefer more versatile forms of capital when inflation is ongoing, as versatile capital would have fewer adjustment costs and a lower likelihood of suffering major losses in value when buffeted by inflation.[29] Similar implications might well hold for human capital. More work could also be done exploring the link between inflation and financial sector activity.

In much the same way that Tullock's work on rent-seeking argued that the true costs of monopolies (or other government interventions) were much greater than the dead-weight

loss triangles of standard static theory, this paper has argued that the true costs of inflation are much greater than those revealed by the institutionless equilibrium approaches of standard monetary theory. These costs become visible when one relaxes the strict assumptions of standard monetary theory and allows institutions, politics, and disequilibrium back into the picture. Okun (1975:364–365) captured this point nicely:

> The recognition by the consumer that economic institutions are gravely disturbed by inflation is an appreciation of reality, not money illusion. The illusion—the Walrasian-general equilibrium illusion or barter illusion—lies in the models of an economy in which inflation does not matter, offering automatic protection to savers through the interest premium on nominal assets and leaving in tact the relative prices of cotton and dacron and the relative wages of janitors and professors.

A reconsideration of the costs of inflation along the lines presented above suggests that those costs are greater than previously believed. In turn, that reconsideration should lead economists to be skeptical of recent claims that moving toward price stability would involve costs in excess of the costs imposed by current modest levels of inflation. Moreover, just as the rent-seeking literature forced analysts to pay more attention to the institutional and constitutional rules surrounding legislative granting of monopolies and privileges, so too should a more complete understanding of the costs of inflation point our attention toward what Yeager (1962) termed "the monetary constitution" (also see Dowd (1994:326)). Avoiding the costs of inflation will require more than just changes in monetary policy, it will require a rethinking of the relationship between the institutions of monetary policy and the political process.

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Notes

1. See Akerlof, Dickens, and Perry (1996), Hess and Morris (1996), Thornton (1996), Feldstein (1997), Pakko (1998), and Chadha, Haldane, and Janssen (1998) for a recent sampling of this literature. Howitt (1990) is often credited with opening this line of inquiry. It is worth noting that almost all of this literature assumes that price stability is the desired goal. In this paper, I will assume that the desired goal is monetary equilibrium, which would allow the price level to move inversely to changes in factor productivity. See Selgin (1997) for more on the so-called "productivity norm."
2. Earlier attempts to broaden the costs of inflation include Okun (1975), Yeager (1981), Leijonhufvud (1981), and Laidler (1990).
3. Dowd (1994) reviews the standard literature on the costs of inflation and argues that even on its own terms, this literature substantially underestimates the costs of inflation and therefore underestimates the benefits of moving toward zero inflation. Dowd's argument focuses on the more narrow economic costs of inflation, while the argument below looks at the broader political and economic effects. This broader emphasis suggests

that even Dowd's fairly high cost estimates may be significantly understated. As Dowd (1994:325–326) also points out: "There are good reasons to believe that the most important costs of inflation . . . simply cannot be measured, and it would be a grave mistake to presume that what we cannot measure does not exist or does not matter." See also Dowd (1996, ch. 15).

4. The pioneering study here is Bailey (1956). See also Kessel and Alchian (1962) as well as Howitt (1990), Cooley and Hansen (1989, 1991), Benabou (1991) and Imrohoroglu (1992), as well as arguments raised in the literature cited in note 1.
5. See, for example, Mussa (1977), Mankiw (1985), Parkin (1986), and Caplin and Spulber (1987).
6. These various explanations are nicely surveyed in Dowd (1996, ch. 15).
7. See the empirical evidence of Vining and Elwertowski (1976) and Hercowitz (1981), as well as the theoretical treatments of Hercowitz (1981), Parks (1978), and Cukierman (1982), which build from the classic contributions of Lucas and Rapping (1969) and Lucas (1973).
8. See Kessel and Alchian (1962:383, 385): "A higher rate of anticipated inflation will produce lower tax proceeds per unit of real value of money balances held by a community, but it also reduces stocks of money balances in real terms....The more a community shifts from money to [imperfect] money substitutes, the greater the welfare loss and the smaller the real tax receipts attributable to any given rate of change of prices."
9. For example, see Hercowitz (1981:332): "This new money is assumed to be distributed equally across the markets."
10. This argument also suggests a major problem with indexation schemes. If one simply adjusts nominal values according to some measure of the average price level, one is ignoring the fact that very few goods and services will be affected "on average" by inflation. The appropriate adjustment to make for a specific seller depends on the particular path that inflation has taken through the economy. Knowledge of that path, and the precise effects of inflation, are nearly impossible to acquire.
11. This version of relative price effects traces back to Richard Cantillon and continues through David Hume and Henry Thornton and up to Ludwig von Mises (1980) in the 20th century.
12. See Kirzner (1992b) for a discussion of this distinction between induced and underlying variables and their relationship in an Austrian conception of the market process.
13. Although even accounting involves forward-looking estimates of asset prices.
14. Note also that to the extent these accounting data serve an *ex ante* informational role to the next round of entrepreneurial plans, they will perpetuate this error.
15. If one is tempted to ask why such an inferior set of institutions or policies would be chosen, it is important to remember that those who chose institutional arrangements or policies may privately gain from them even if those arrangements diminish social well-being. Alternatively, inferior sets of institutions and policies might not be not chosen, rather they might emerge as unintended consequences of self-interested behavior and/or erroneous beliefs about what institutions are best.
16. This point identifies the problem with Caplin and Spulber's (1987:711) definition of neutral money as when "aggregate real output is invariant to monetary shocks." Relative price effects along with the expenditures made to combat inflation may leave conventional measures of real output unchanged during inflation, obscuring the underlying loss in welfare represented by the wastefulness of some of the expenditures counted in GDP.
17. One testament to the significance of the costs of inflation is that despite this argument, the empirical literature supports the proposition that inflation is associated with lower growth rates in GDP. See the Fischer (1991) and Barro (1995).
18. These irretrievable adjustment costs and *misallocations* of capital and labor are in addition to inflation's tendency to reduce the quantity of investment and the size of the capital stock. On the latter point see the discussion in Dowd (1994).
19. The following paragraphs draw heavily on Horwitz (2000, ch. 4).
20. See also Yeager (1981:38): "The time and effort devoted to coping with inflation, as well as the uncertainty and sheer anxiety it causes, should count negatively in a comprehensive assessment."
21. As Pakko notes, not all of this increase can be attributed to inflation, but it does provide some evidence on the question. He (1998:42) also reports on evidence from Brazil, where during the high-inflation period of the early 1990s, its financial sector accounted for 15 percent of GDP, which was higher than most other countries. Further evidence for Brazil comes from a report on Latin American inflations in *U.S. News and World Report* (March 5, 1990:61), which noted that "Dow Chemical's Sao Paulo branch has three dozen employees who

do nothing but monitor the financial market." One measure of the cost of inflation is the forgone output that would have come from devoting those resources directly to production. Note that this is a good example of the limits of measuring the costs of inflation by reference to GDP, as discussed earlier.

22. This argument is just a version of the age-old response to the argument that natural disasters are an economic boon because of all of the jobs created during the clean-up and rebuilding process. Of course those jobs are created, but they are simply replacing what was destroyed, not building anything new. Had the disaster not occurred, we would have both the existing capital stock *plus* what could be produced by the labor now diverted to the clean-up process. This argument dates back to Bastiat and was reprised by Hazlitt (1946).
23. It should be clear that these coping costs are *analogous* to rent-seeking expenditures, not an example thereof. The next section will discussion the relationship between inflation and rent-seeking.
24. Laidler (1990:50) also invokes Coase in discussing the costs of inflation, but his point was more that inflation increases the cost of holding money, reducing the likelihood that people will partake in money-using institutions like the market in coordinating their behavior. The point in the text is more concerned with the costliness of using the price system more generally, rather than with holding money more narrowly.
25. Even if it is true that the political process can only redistribute, not create, wealth, it does not matter to the individual. The source of wealth (i.e., whether it is "new" or redistributed) is not the issue. As long as the individual perceives each process as a net gain to *his* wealth, he will treat them as equivalent, independent of the social consequences of using either one.
26. The discussion that follows builds on the excellent analyses of these issues by Laidler and Rowe (1980) and Leijonhufvud (1981).
27. Once again, as in Tullock (1967:48–49): "As a successful theft will stimulate other thieves to greater industry and require greater investment in protective measures, so each successful establishment of a monopoly or creation of a tariff will stimulate greater diversion of resources in attempts to organize further transfers of income."
28. Laidler and Rowe (1980:102) also argue that, "In short, if monetary theory is best approached along Austrian lines, then we must conclude that mainstream monetary theory for all its considerable accomplishments, not only trivializes the social consequences of inflation in particular, as Axel Leijonhufvud has argued, but that it greatly underestimates the destructiveness of monetary instability in general."
29. Of course the cost of using more versatile capital under an inflationary regime is the foregone efficiencies associated with capital more specific, and thus more productive, with respect to the production process at hand.

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