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The Case For and Against Indexation: An Attempt at Perspective

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IN THE 1930s, when widespread unemployment was the economic malaise threatening the foundation of a free society, Professor John M. Keynes, of King's College, prescribed fiscal activism as a cure. Now in the 1970s, rampant inflation is seen by some to threaten the viability of a free society. Professor Milton Friedman, of the University of Chicago, has prescribed indexation as an effective expedient to preserve a free society.¹

Indexation proposals, however, have encountered historically less-than-enthusiastic receptions in many quarters, in spite of the advocacy by many eminent economists. This article seeks to unveil some of the less apparent aspects of indexation in order that one may achieve a deeper understanding of the theoretical and practical issues involved.

GENERAL BACKGROUND OF INDEXATION

Indexation, or index-linking, refers to proposals to link the number of dollars to be delivered on a contract to changes in some specified price index. Under indexation, money would continue to be used as a medium of exchange and as a measure of value, but not necessarily as a standard for deferred payments. In the event that the purchasing power of the dollar changed as indicated by an agreed-upon price index, contracts would be honored in terms of a unit of con-

stant purchasing power over "goods and services in general."² Thus, an index-linked contract to deliver \$100 a year from today would deliver \$110 if prices rose by 10 percent over the interval, that is, if the purchasing power of the dollar declined by 9.09 percent.

Coverage

The basic objective of indexation is the insulation of contractually-created claims on output from the effects of changes in the purchasing power of money over goods and services in general (inflation or deflation). In a completely indexed world, all of the following would be indexed: all private and public wage and loan contracts including deposits at thrift institutions, insurance, and pension contracts; social security and other transfer payments, including unemployment compensation; and, of course, government tax receipts. With respect to taxes, indexation would apply mainly to income taxes by adjusting the level of exemption, the tax brackets, and the base of asset valuations. The progressive income tax rate itself would remain invariant for a given social decision regarding the relative size of the government sector. Since profit shares are noncontractual items and are

¹Milton Friedman, "Using Escalators to Help Fight Inflation," *Fortune* (July 1974), pp. 94-97, 174-76.

²With changes in relative prices, the constant purchasing power of money over "goods and services in general" necessarily implies variable purchasing power over at least some of the goods and services in the basket; that is, with relative price changes, the "index number problem" inevitably creeps in. See Ragnar Frisch, "Annual Survey of Economic Theory: The Problem of Index Numbers," *Econometrica* (1936), pp. 1-38.

determined residually, they would not be indexed.³ However, to the extent that such contracts as those for purchases of materials are indexed, it appears likely that profit shares of some intermediate goods producers would be indirectly protected through indexation.

Even money would be indexed under a *completely* indexed economy.⁴ In a pure currency economy without private money producers (banks), indexation of currencies could be facilitated by dating them, such as Sylvio Gessell's stamp money proposal.⁵ With bank-created money and legal reserve requirements, the task would be more difficult and would require frequent intervention by the central bank.

Experiences With Indexation

A review of foreign experience with regard to indexation shows a wide variety of practices with respect to the classes of contracts indexed, the extent of the compensation allowed, and the choices of indices to which the contracts are tied.⁶ The most comprehensive indexation was provided initially by Finland and then by Israel, France, and most recently by Brazil. In addition to employment contracts, various loan, insurance, and pension contracts have been tied to a number of price indices as well as to the price of specific foreign exchange and commodities, such as that of gold Napoleons in the case of France. The People's Republic of China first introduced the indexation of bank deposits in 1949, followed by Finland in 1955, and more recently by Brazil in 1965.

Experience with indexing loan contracts in the United States and the United Kingdom has been scanty. Irving Fisher prevailed on the Rand Kardex Company in 1925 to issue bonds tied to the wholesale price index, but these bonds were soon converted into preferred stocks and ordinary bonds.⁷ The United

Kingdom did not adopt indexation for loan contracts until 1973. The number of people whose incomes are partially protected by indexation in the United States has increased dramatically in the past several years, mainly through the wider use of escalator clauses in labor contracts, the adoption of indexed social security payments, and the food stamp program.

Failure to Gain General Support

Indexation has historically enjoyed the support of many illustrious economists, such as Stanley Jevons, Alfred Marshall, Irving Fisher and John M. Keynes. Until the end of World War II, however, indexation had failed to elicit the support of policymakers or capture the interest of the general public.⁸ The fundamental reason appears to be that the economists who advocated such proposals had not designed an acceptable means for their implementation. They tended to emphasize the *desirability* of the proposal as if ". . . we had a clean sheet of paper to write upon."⁹ Too often they failed to consider explicitly how the new arrangement would affect existing institutions and outstanding commitments. Often missing was a comprehensive analysis of the likely distribution of the total costs of transition. An important subsidiary explanation for the failure of indexation to elicit popular support appears to be the implicit public judgment that the economics profession has not, as yet, provided a generally acceptable index of price change.¹⁰

THE CASE PRESENTED FOR INDEXATION

The fundamental case for indexation, in essence, rests on the claim that it would approximate the results associated with a stable price level — even in the absence of price level stability.¹¹ The theoretical

⁸For a historical overview, see Finch, "Purchasing Power Guarantees," pp. 1-22.

⁹Woodrow Wilson's first inaugural address in *The Inaugural Addresses of the American Presidents*, annotated by Davis Newton Lott (New York: Holt, Rinehart and Winston, 1961), p. 201. This partial quote refers to the founding of the Federal Reserve System and is displayed inside the entrance to the Federal Reserve Building in Washington, D.C.: "We shall deal with our economic system as it is and as it may be modified, not as it might be if we had a clean sheet of paper to write upon; and step by step we shall make it what it should be."

¹⁰Benjamin Klein, "The Measurement and Social Costs of Inflation: The Recent Inflation and Our New Monetary Standard," unpublished paper (Los Angeles: University of California, Los Angeles, 1974).

¹¹Irving Fisher, *The Purchasing Power of Money*, 2nd ed. rev. (New York: Augustus M. Kelley, Bookseller, 1963), and *Stabilizing the Dollar*, (New York: Macmillan, 1920); Alfred Marshall, "Remedies for Fluctuations of General Prices," *Memorials of Alfred Marshall*, ed. Arthur C. Pigou (New York: Kelly and Millman, Inc., 1956), pp. 188-211.

³Milton Friedman, *Price Theory* (Chicago: Aldine Publishing Company, 1962), p. 99.

⁴William J. Baumol, "The Escalated Economy and the Stimulating Effects of Inflation," in *Essays in Honour of Marco Fanno*, vol. 2, ed. Tullio Bagiotti (Padova, Italy: Edizioni Cedam, 1966), pp. 96-104.

⁵For a full discussion of Gessell's proposal see John M. Keynes, *General Theory* (New York: Harcourt, Brace and Company, 1935), pp. 357-58.

⁶David Finch, "Purchasing Power Guarantees for Deferred Payments," *International Monetary Fund Staff Papers* (February 1956), pp. 1-22; Miroslav Kriz, "Inflation: The Case for Indexing," and Nigel Althaus, "The Case for the U.K. Indexing Gilts," *Euromoney* (June 1974), pp. 19-27; and United Nations, Economic Commission for Latin America, "Index Clauses in Deferred Payments," *Economic Bulletin for Latin America* (October 1957), pp. 73-89.

⁷Economic Commission for Latin America, "Index Clauses in Deferred Payments," p. 76.

presumption in favor of price level stability is that a fluctuating price level has undesirable effects on the distribution of income and on the efficient utilization of resources. In addition, the argument has recently been advanced that indexation would help to *achieve* price level stability.

Distributive and Allocative Effects of an Unstable Price Level

Inflations have real consequences when they are imperfectly anticipated. Even when perfectly anticipated, inflations affect allocative decisions.

Income Distribution — From the point of view of equity in the distribution of wealth, a stable price level is superior since the redistributive effects of a less than fully anticipated inflation do not occur. The distributional implications of imperfectly anticipated inflation depend crucially on the existence of binding contracts fixed in nominal monetary units (monetary contracts, hereafter). For a given stock of existing monetary contracts, be they loan or employment, the magnitude of distributional effects depends positively on the gap between the actual and the anticipated rate of inflation at the time of contract formation. If all the transactor units were neither net monetary debtors nor creditors, there would be no distributional effects.¹² In the event of an under-anticipated inflation, net monetary debtors gain and net monetary creditors lose; the conclusion is reversed in the event of an over-anticipated inflation. The opposite distributional effects occur during a deflation.

The effects of imperfectly anticipated inflation on the distribution of income generally have been considered undesirable. As Irving Fisher, who pioneered the seminal distinction between anticipated and unanticipated inflation, put it, “. . . the real evils of changing price levels do not lie in these changes *per se*, but in the fact they usually take us unaware. It has been shown that to be forewarned is to be forearmed, and that a foreknown change in price levels might be so taken into account in the rate of interest as to neutralize its evils.”¹³

Resource Allocation — In a money economy the commodity called money performs the services of collecting information and facilitating exchange between all participants in transactions. In an anticipated stable price environment, money is believed to promote

efficiency by freeing other resources from the task of information gathering.¹⁴

When the price level changes rapidly and is anticipated to any extent, the holding of money becomes more costly and its services less efficient. Other resources are then drawn into the performance of money services, leaving less resources available for the production of goods and services. This inflation-induced reallocation of resources would shrink the effective, as distinct from the notional, production possibility frontier, thereby reducing the amount of goods and services available for present and future consumption.¹⁵

Indexation Helps Achieve Price Level Stability

Traditionally, the advocacy of indexation was based on distributive equity and, to a lesser degree, on allocative efficiency grounds.¹⁶ Recently, a third dimension, based on a diagnosis of the underlying cause of modern inflation, has been added. The modern day proponents of indexation, represented by Professor Friedman, have thrown in a sweetener. They claim that indexation would tend to restore price level stability in an existing inflationary situation. Their position can be interpreted to be based on their implicit diagnosis that inflation is a “political phenomenon.”¹⁷

Their argument would run as follows. Inflation occurs as a result of an increase in a nation's money stock in excess of the ability of the economy to produce goods and services. Usually the initial force leading to inflation is increased demand for government expenditures to aid various sectors of the economy or segments of the population. Those demanding greater government services may not even be aware of the inflationary consequences of their actions. It is only necessary that in striving to better their relative and absolute

¹⁴Given imperfect foresight, a variable monetary yardstick (implied by a fluctuating price level) increases the uncertainty associated with any monetary contract and, assuming aversion to purchasing power risk, increases the cost of reaching agreement.

¹⁵Robert Clower, “The Keynesian Counterrevolution: A Theoretical Appraisal,” in *The Theory of Interest Rates*, ed. Frank H. Hahn and Frank P. R. Brechling (London: Macmillan and Co. Ltd., 1965), pp. 103-25. Clower's distinction between notional and effective demand has been adapted here.

¹⁶Finch, “Purchasing Power Guarantees,” pp. 1-22, and W. Stanley Jevons, *Money and the Mechanism of Exchange* (New York: Twentieth Century Press), p. 91.

¹⁷Joan Robinson, “Quantity Theories Old and New,” *Journal of Money, Credit and Banking* (November 1970), p. 512. The term “political phenomenon” was coined by Robinson in the article. The juxtaposition of the term, with the resulting implications for indexation, is that of the author's.

¹²Reuben A. Kessel and Armen A. Alchian, “Effects of Inflation,” *Journal of Political Economy* (December 1962), pp. 521-37.

¹³Fisher, *Purchasing Power*, p. 321.

positions they induce an accommodating increase in the nominal money stock which is faster than would be consistent with price level stability.

In this interpretation of their view, although the villain fostering the inflation is the public demanding more from government, the basic cause is much deeper. It is imbedded in our system of "advocacy politics."¹⁸ Those who are ultimately responsible for inflation are those who succeed in inducing the government to try to command a greater share of society's resources than is explicitly provided for in tax laws.

THE CASE PRESENTED AGAINST INDEXATION

Historically, indexation has been proposed at times of on-going and relatively high rates of price change. The case generally advanced against such a proposal has been based primarily on the fact that we do not start with a "clean sheet of paper to write upon." Since at any moment there exist outstanding contracts which are not indexed, it is argued that indexation would tend to cause problems for those individuals and institutions involved in such contracts.

An additional standard argument against the indexing proposal has been that the adoption of such a proposal would tend to weaken support for anti-inflation policies. More recently, some have contended that indexation would tend to affect adversely the terms of international trade for an open economy.

The following statements were made by the Council of Economic Advisers and others in 1952 in opposition to the proposed issuance of a purchasing power bond by the Treasury. These statements are representative of the arguments used against indexation in general.¹⁹

Would weaken support for anti-inflation actions

The issuance of a purchasing power bond would imply a defeatist attitude toward the problem of inflation. Widespread ownership of purchasing power bonds would add another group to those who think themselves sheltered from the effects of inflation, and would weaken public support of a stabilization program.

The proposal for purchasing power bonds applies the principle only to a limited amount of bonds. The Government would thus add an admittedly at-

tractive feature to one type of security offered to the public in competition with other Government bonds and such other forms of assets or contracts as currency, demand, time and savings accounts, shares in savings and loan associations, and life insurance policies. It is very likely that great pressure would develop to extend the purchasing power clause also to other investments, public and private. The greater the number of persons who considered themselves shielded from inflation, the greater would be the possibility of its occurrence.

Would harm some individuals and institutions

The demerits of the proposal are clear and compelling. First the issuance of a Government bond, the value of which was guaranteed in terms of purchasing power, would place other forms of fixed-interest investment at a decided disadvantage and would jeopardize the continued existence of such other forms of investment. There would be raised, therefore, the serious problem of fairness to savers who already had their savings programs in effect. Moreover, it appears inevitable that the adoption of a constant purchasing power Government bond would lead to a disastrous collapse in the value of outstanding investment media.

Would be difficult to choose appropriate index

The determination of the index measuring the price at which the bonds would be repaid would present technical difficulties and — no matter how decided — would result in popular dissatisfaction.

Would weaken terms of international trade

A new dimension in terms of an open economy context has been injected recently. Based on the premise that indexation would accelerate inflation, Professor Murray L. Weidenbaum objects to indexation on the ground that:

We do not live in a closed economy. We already have seen that accelerating inflation at home means devaluation of our currency abroad. That brings deterioration in the terms of trade and declines in our real standard of living.²⁰

ASSESSMENT OF THE ARGUMENTS

Both sides of the debate appear to agree that (1) an inflationless alternative is ideal, and that (2) indexation would prevent the emergence of inflation-induced distributional effects (making "living with inflation" easier).

As mentioned earlier, the proponents tend to ignore the transitional costs involved in adopting indexation,

²⁰Murray L. Weidenbaum, "The Case Against 'Indexing,'" *Dun's* (July 1974), p. 11.

¹⁸George P. Shultz, "Reflections on Political Economy," *Journal of Finance* (May 1974), pp. 323-30.

¹⁹U.S. Congress, Joint Committee on the Economic Report, *Monetary Policy and the Management of the Public Debt*, Part 2, 82nd. Cong., 2nd. sess., 1952, pp. 888-89, 1097, 1109.

while the opponents tend to emphasize the likely effects on the viability of certain existing institutions. With regard to the inflationary implications of adopting indexation, the proponents and the opponents are diametrically opposed.

To help assess the pros and cons of indexation, let us first speculate on the properties of an idealized, completely indexed economy. Such speculation would help to illuminate the possible difficulties accompanying any period of transition to necessarily less-than-complete indexation.²¹

Some Properties of a Completely Indexed Economy

Relative Price Changes—It might appear that in a completely indexed economy, the relative prices of various goods and services would remain constant. Indexation, however, does not immunize a producer from the risk of changes in relative prices incident to changes in preferences, technology, or weather. A set of relative (output) prices would still guide the allocation of resources. Indexation is designed to insure only the equality between the realized and the contracted claims on output for the *hired* factors of production.

Government's Claims On Resources—The share of resources commanded by and flowing through the government would ideally not deviate much from the level that the public "voluntarily" transfers through its pledges of current and future tax payments. The government would be deprived of the power to collect inflationary taxes from the populace. The income tax system, with indexed exemptions, asset revaluations, and indexed tax brackets, would lose a considerable amount of "built-in" stabilization potency widely thought to be associated with a progressive tax structure.²² However, should the government attempt, through continued creation of money, to command more real resources than those tendered in explicit tax payments and private-sector lending, inflation would persist and the price level could approach infinity.

Existence of Inflation—An intriguing question arising in this context is the consequence of moving into

a regime of indexation from the initial position of inflationary disequilibrium. Without indexation, a given rate of inflation may eventually be eliminated by the inflation-induced changes in income and wealth distribution. A completely indexed economy would be devoid of this mechanism, and hence would bring into the open the underlying conflict of interest existing among the competing claimants.

Absence of Money Illusion—Various forms of "money illusion" would be completely absent from the system. Money illusion would be absent in wage negotiations. The absence of money illusion in wage perceptions would tend to "worsen" the terms of the short-run trade-off between inflation and unemployment in the sense that no amount of inflation would buy less unemployment; that is, the short- and long-run Phillips curves coincide, being vertical at the natural unemployment rate.²³ This factor would tend to reduce opposition to an anti-inflation policy. In addition, the behavior of interest rates on loans as well as negotiated wages would tend to stabilize since they would not embody anticipations of inflation.

Informational Efficiency of Markets—More extensive use of the markets would be encouraged under indexation for inter-temporal exchange and transformation of resources. To the extent that the costs of collecting and processing the information regarding productive opportunities are lowered through market exchange, real output would be increased for a given structure of preferences and a given state of technology.

Risk-free Asset—Indexation provides assets which are free of purchasing power risks. A short-term monetary asset in this regime, such as Treasury bills, would be free of purchasing power risk in addition to default and relative price risk associated with changes in interest rates. The availability of such an asset would rescue much of the theoretical results of the modern capital pricing and portfolio choice theories which are predicated on the existence of a riskless asset.²⁴

Potential Impact of Indexation on Inflation

Although indexation, by itself, would not prevent price level changes, the advocates appear to believe

²¹A real-world exchange economy cannot have its money indexed and still remain viable. See Baumol, "The Escalated Economy," pp. 96-104, and Amotz Morag, *On Taxes and Inflation* (New York: Random House, Inc., 1965), pp. 144-73.

²²"The Deceptive Lure of Indexation," *Business Week*, 25 May 1974, pp. 147-52.

²³For a discussion of short- and long-run Phillips curves, see Roger Spencer, "The Relation Between Prices and Employment: Two Views," this *Review* (March 1969), pp. 15-21.

²⁴Marshall Sarnat, "Purchasing Power Risk, Portfolio Analysis, and the Case for Index-Linked Bonds," *Journal of Money, Credit and Banking* (August 1973), pp. 836-45.

indexation would reduce inflation by reducing the pressure for inflationary policies and by making anti-inflationary policies more palatable. The opponents of the proposal argue that indexation is likely to exacerbate inflation since by removing its sting, the constituency for anti-inflationary policies would be weakened. They recommend more resolute anti-inflation policies, but seldom provide an analysis of the underlying force driving inflation.

What is critically missing in the argument that indexation would lead to accelerating inflation is the analysis of why inflation occurs. In the absence of any analysis as to the incentives and the mechanics of inflation, a case based on the fears of accelerating inflation (which is conceded to be "functionless" in terms of distributive benefits) is not very persuasive.

As noted earlier, the proponents provide such an analysis of inflation in terms of advocacy politics and the share of resources commanded by the government. From this perspective of the diagnosis of inflation, it is the government-deficit-induced increase in the nominal money stock which underwrites persistent inflation. The issue fundamental to the inflationary implication of indexation, then, may be posed as: is indexation more likely to lead to the abatement of pressures for policies which lead to inflation?

The advocates of indexation answer the query affirmatively. They cite the reduced incentives to promote inflationary policies under indexation as well as the asserted reduction in the costs of anti-inflation policies to bolster their case. Their case would be more persuasive if one could accept their implicit premise that taking the "honey" out of inflation would reduce the pressures for policies which are likely to lead to deficits, excessive monetary growth, and the entailed inflation. As was touched upon earlier in discussing the inflationary implication of moving into complete indexation from the initial condition of inflationary disequilibrium, their implicit premise is not based on a firm foundation.

Why Attempt to Reduce Inflation Under Complete Indexation?

The modern proponents of indexation seldom make explicit what additional benefits they perceive for the asserted abatement of inflation if its distributional effects are neutralized under indexation. Passing references to the nuisance of bookkeeping changes are made. However, the possible gain in allocative efficiency associated with the inflationless solution alluded to earlier is seldom made. If, as the proponents argue,

indexation neutralizes the distributive effects of inflation, isn't the presumed anti-inflation benefit of indexing simply superfluous without some amplification of the effects on resource allocation and balance-of-payments developments?

In evaluating the balance-of-payments effects, one must take into consideration the prevailing foreign exchange rate system and whether or not indexation will lead to more or less inflation. Under a freely-fluctuating exchange rate system, the case for indexation would not be affected by its balance-of-payments effects, regardless of its effects on inflation; exchange rates would simply change to reflect changing rates of inflation. Under a fixed exchange rate system, however, the case for indexation would be greatly attenuated if it results in accelerated inflation, as some opponents contend. This is so since the likely consequences would include increased restrictions on product and capital flows to cope with the emerging balance-of-payments difficulties.

A Recent Experience With Indexation and Inflation

Some of the proponents of indexation have cited the example of Brazil as a case in which adoption of indexation has both reduced inflation and increased growth of output. Interpretations differ as to the role that indexation played in the Brazilian "miracle." Friedman suggests that indexation contributed both to accelerated growth and decelerated inflation. Both Walter W. Heller and Ronald A. Krieger tend to emphasize the incidental contribution of indexation to growth. They assert that the main spring of growth was the enforced redistribution of income to capital from labor which could have occurred only in a regimented command economy. They leave unexplained the deceleration of inflation.

Our reading of the Brazilian experience suggests that both occurrences are the predictable effects of conscious policy choices made by the government with the tacit approval of the populace. The government of Brazil replaced inflationary taxation as the dominant form of a savings-investment technology in 1964 with financing through capital markets and direct taxation.²⁵ The motive for this action was the realization that the yield of inflationary finance had atrophied alarmingly as people increasingly made adjustments by such devices as capital flight abroad and

²⁵David M. Trubek, "Law, Planning and the Development of the Brazilian Capital Market," *The Bulletin* (New York: New York University, April 1971), pp. 20-21.

barter transactions. The consequent massive reforms in tax laws, tax administration, and in the capital market regulations proved effective.²⁶

Ingenious tax incentives, such as granting tax credits for the purchase of shares in the so-called 157 Funds (specially created mutual investment funds), which are then used to purchase new and secondary equity issues, stimulated the development of equity markets and promoted savings.²⁷ The government, in effect, used the tax system to elicit savings, but relied on the newly developed capital market and the price system to allocate the savings thus created.

But the single force which contributed most to the decelerated inflation was the government's conscious and deliberate policy of reducing deficits. *The abandonment of inflation as a savings-investment technology must be credited for checking inflation, not the indexation per se.* The adoption of indexation, coincident with the move toward less inflationary policies, served primarily to eliminate the inflation-induced income distribution. Its contribution to the deceleration of inflation was accommodative rather than causal.

Economic growth in Brazil can be explained at least partially in terms of the increase in forced savings induced by changed tax laws. In addition, the increase in allocative efficiency arising from the market direction of resource flows may be construed as a contributing factor to the observed growth in Brazil.

It must be noted that in Brazil there are relatively small amounts of outstanding monetary contracts. Since the existence of monetary contracts complicates the implementation of indexation, it is likely that opposition to such a proposal would be more muted in a country like Brazil than in the United States.

Effect of Indexation on Existing Contracts and Institutions

Professor Friedman strongly favored the issuance of the purchasing power bond in 1951 and based the continuation of his advocacy mainly on equity and ethical grounds. He subsequently broadened the scope

of his proposal by including private securities and the income tax systems (1973). Reinforced by the "economic miracle" wrought by Brazil with an assist from "monetary correction," and compelled by accelerating inflation domestically, he has recently mounted a vigorous campaign for indexation reminiscent of his advocacy of freely-fluctuating exchange rates and monetarism.²⁸

Writing on October 29, 1973, he conjectured that the ". . . time is ripe for private purchasing power bonds. A breakthrough awaits only our imaginative bond underwriter."²⁹ The recently announced issue by Citicorp, a bank holding company anchored by the First National City Bank, New York, seems to be the response to Friedman's challenge. It has a provision for a variable interest rate one percent above the Treasury bill rate and redemption options at face values twice a year. This particular instrument may be interpreted as a form of *de facto* purchasing power bond if one regards changes in the Treasury bill rate as reflecting only the changes in the actual, rather than the anticipated, inflation rate. To the extent that the changes in the Treasury bill rate incorporate changes in the underlying real interest rate, this instrument would have the added feature of reducing relative price risk as well.³⁰

In order to explain the above assertion, let us analyze the relationship which would hold between an indexed and a nonindexed bond. Abstracting from risk-aversion, at the time of issue the interest rate set for a nonindexed bond would exceed the rate on an indexed bond by the expected rate of inflation. Assume for simplicity that both are consols (bonds without maturity dates) and the indexed bond is protected for the full value of interest payments. What would happen to the market (present) values of these bonds as inflationary expectations change? Market value of the indexed bond would be invariant with changed expectations of inflation, whereas that of the nonindexed bond would move inversely with the changes. As far as the change in the real interest rate is concerned, both bonds would be affected, but the variability of the indexed bond would be greater

²⁶Ibid., pp. 22, 25. The Capital Market Law of 1965 authorized monetary correction for debt instruments and bank deposits, and introduced authorized but unissued shares. The Law also removed effective barriers to indexation and lending at positive real rates in an inflationary environment with usury limits of 12 percent, except in the short-term *letra* market (a *letra* is comparable to a banker's acceptance).

²⁷Ibid., pp. 56-65.

²⁸Milton Friedman, "Purchasing Power Bonds," *Newsweek*, 12 April 1971, p. 86, and Friedman, "Economic Miracles," *Newsweek*, 21 January 1974, p. 80.

²⁹Milton Friedman, "More on Living With Inflation," *Newsweek*, 29 October 1973, p. 96.

³⁰A "true" purchasing power bond protects the holder only against price level changes, while leaving the holder vulnerable to relative price changes, that is, the risk of changes in the real interest rate, which reflects the exchange rate between present and future consumption options.

for anticipated inflation.³¹ Assuming risk aversion, the relative attractiveness of the two bonds would crucially depend on the perceived relative variability of real interest rates and anticipated inflation rates. If the market judged that the expected rates of inflation were more volatile than real interest rates, again assuming risk aversion, the indexed bond would be relatively more attractive. Thus, it would command higher prices and lower effective yields; that is, a borrower may borrow at lower yield with the indexed bond than with the nonindexed bond. Available evidence from Israel is suggestive in this regard.³²

The sometime advanced argument that the introduction of indexed bonds would adversely affect the price of existing bonds must then implicitly assume that the mere introduction would raise either the expected rate of inflation, which is debatable, or the real rate of interest, which is doubtful. The market price of existing bonds may be substantially below the original sale price, but this would be unrelated to the introduction of indexed bonds. The reduction would simply reflect the past history of movements in the market rates of interest, which reflect both the changes in the real rate and the inflation rate.

The introduction of indexed bonds would adversely affect the *issuer* of new nonindexed bonds. Under the assumed condition of relatively greater attractiveness for indexed bonds, the implied higher costs of borrowing for the incumbent borrowers mean lower wealth for the incumbent "conventional" borrowers. If there are legal impediments to issuing an indexed bond (possibly due to the statutory limits on both the lending and borrowing rates), the incumbents would lose wealth as the new indexed bonds joined the competition for funds.

It would not be surprising if those who stand to lose by the innovation would try to block access to the market in order to protect their wealth. The current lively counter-offensive by the thrift institutions to deny access to markets to the issuers of *de facto*

³¹This is because the elasticities of market values of indexed and nonindexed consols with respect to a once-and-for-all change in the real rate of interest can be shown, respectively, as

$$-\frac{(1 + \Pi_0)r_t}{r_t + r_t\Pi_0 - r_0\Pi_0} \text{ and } -\frac{(1 + \Pi_0)r_t}{r_t + r_t\Pi_0 + \Pi_0}$$

where Π_0 is the rate of inflation anticipated at the time of contract formation, r_0 is the real rate of interest at the time of contract formation, and r_t is the real rate of interest at time t subsequent to contract formation. See the appendix, available on request, for demonstration.

³²Alexander Rubner, "The Abdication of the Israeli Pound as a Standard of Measurement for Medium and Long-Term Contracts," *Review of Economic Studies* (October 1960), pp. 69-75.

purchasing power bonds is instructive in this regard.³³ The foregoing suggests that it is not so much the values of existing bonds but the wealth of the existing equity owner and/or the viability of certain financial institutions which are threatened when indexed bonds are introduced without appropriate changes in the whole spectrum of legal and institutional arrangements.

The barriers to the introduction of indexation by the government and the private sectors are legal and economic. Indexing of income taxes and the issuance of index-linked government bonds would require legislative acts and the required legislation appears to entail significant political realignments. Opposition would appear to be concentrated in thrift industries such as savings and loan associations and mutual savings banks. The motive underlying opposition to indexation would appear to be the entailed loss in wealth consequent to the introduction of indexation without any provision to "socialize loss," such as a guaranteed purchase at par of the assets held by these institutions.

As noted recently by Professor Friedman, indexing income taxes would help facilitate the introduction of a private index-linked bond by exempting interest adjustments from the income tax levy. Indexing government securities would also stimulate the introduction of private indexed bonds by competitive forces as well as by preempting the state usury restrictions on loan contracts. The availability of index-linked instruments would facilitate the spread of indexation by providing hedging opportunities to such financial intermediaries as savings and loan associations, life insurance companies, and commercial banks.

Longer-Term Contracts Would Result

Under indexation longer-term contracts would likely result — a development which, on net, could be regarded as a benefit. Under a nonindexed regime with high and variable rates of inflation, the tendency toward shortening of maturity emerges because short-term instruments provide a relatively higher degree of income and capital certainty. The above holds as long as the perceived variability in the expected rates of inflation is greater than that in the real interest rate. The Israeli experience, referred to earlier, tends to confirm this view.

Effective indexation would shelter the parties to a monetary contract from the effects of unanticipated

³³"Savings Associations Oppose Proposed Citicorp Note Issue," *New York Times*, 2 July 1974, p. 55.

changes in the price level. However, the outcome would be different from that of a nonindexed regime only if changes in the price level that occur are imperfectly anticipated. The transactors would eventually provide for anticipated changes in the price level in their contracts. The case for indexation, therefore, is essentially based on the judgment that anticipations about price level changes are neither uniform nor very accurate. Since divergent price expectations tend to restrict the extent of markets, indexation would appear to share most of the merits of a maintained stable price level which generates zero expectations of price level change.

Appropriate Index Not Resolved

The claim of Irving Fisher, made over sixty years ago, that the theory and technique of index number construction was advanced enough to provide a standard monetary yardstick, appears to have been premature.³⁴ The debate on indexation forcefully redirects our attention to a fundamental issue, namely, what is inflation and how do we measure it?

The concept of inflation can be defined only for an economy where money buys goods and goods buy money. Inflation is the sustained depreciation in the purchasing power of money and is measured by the construction of an *appropriate* price index. The reference to *appropriate* is crucial in underscoring the difficulty involved in any attempt to construct a *general* price index. It brings into the open the fundamental issue of the appropriate universe of commodities in constructing the price index.

Should it contain intermediate goods or only final goods? Should it include only newly-produced goods and exclude all existing assets such as land and houses? Should it include only the currently produced flow of services (such as housing services as measured by implicit rental payments) and exclude the currently produced sources of the future flow of services (such as houses and automobiles)? These are weighty and important issues to which satisfactory answers are yet to be given, even at a purely conceptual level.³⁵ The potential divisiveness over the choice of an appropriate index is discernible in labor's current opposition to the prospective revision of the consumer price index.³⁶

³⁴Fisher, *Purchasing Power*.

³⁵Armen A. Alchian and Benjamin Klein, "On a Correct Measure of Inflation," *Journal of Money, Credit and Banking*, Part I (February 1973), pp. 173-91.

³⁶"Labor Bristles at a Broader CPI," *Business Week*, 6 April 1974, p. 18.

SUMMARY

If we abstract from history and ignore the inherited stock of outstanding monetary contracts and specialized financial institutions, the case for indexation appears persuasive. It would prevent the emergence of an unintended distribution of income and thereby serve the cause of fairness. If indexation of income taxes and government obligations facilitates an effective check on "unauthorized" growth in the government's share of resources, its adoption would likely lead to government policies which would moderate the rate of inflation rather than exacerbate it. Inflationary policies would indeed lose constituency since the "honey" would have been sucked from such policies.

But, surely, the above reasoning is incomplete. It leaves unanswered the question of how and why the shifting of the balance of political power, required to introduce indexation, would occur. Indexation *per se* would not cause the realignment. Rather, realignment, should it occur, would be a reflection of the "exogenous" shift in attitudes and distributions of effective political power.

We cannot, however, escape from our past nor remake the world anew at will by abolishing existing monetary obligations and financial institutions. We have an inherited stock of monetary contracts which incorporate past expectations of the paths of price level movements. Should the introduction of indexed bonds cause the previously held price expectations to change, a fortuitous change in the relative wealth of sellers and holders of outstanding monetary contracts would ensue. Specifically, should the anticipated (and experienced) rate of inflation fall as a consequence of the introduction of indexed bonds, net monetary debtors would lose wealth relative to net monetary creditors; conversely, net creditors would lose wealth relative to net debtors in the case where indexation induces a higher anticipated rate of inflation than was formerly held.

We have a set of institutions operating under inherited legal and regulatory constraints which restrict their range of asset and liability choices. Should indexation be perceived as inimical to the vested interests of certain groups, opposition to its adoption would undoubtedly be mobilized in the absence of a credible plan to "socialize" the total cost of transition. Advocacy of indexation seldom is accompanied by such a plan, and hence will be met by the organized opposition of those who are likely to be hurt by its

adoption. The opposition will not likely be assuaged by a demonstration that indexation will serve the general interest.

We can discern the following three possible denouements for indexing government revenues and obligations:

- (1) Indexation may be adopted over opposition through the contest of relative political power.
- (2) Indexation may be adopted with the consent of the former opposition when a credible plan to compensate the potential losers is appended as a rider. Such a plan may include a guaranteed purchase at par of existing mortgages held by thrift institutions.

- (3) Indexation may, of course, be rejected even if the balance of benefits over losses is shown to be positive.

As noted earlier, however, a partial indexation in the sphere of private wage contracts and public pension contracts is with us already. The question of removing the legal barriers to indexing private loan and deposit contracts still remains. The recent proposal by the Canadian government to "inflation-proof" its income tax structure may be the wave of the future. The overriding question, however, is the degree of restraint that revenue indexation would impose on the government's demand for a greater share of scarce resources.



Grain Export Quotas: The Short View and the Long

CLIFTON B. LUTTRELL

GRAIN export controls have been suggested as a means of reducing the unfavorable impact on domestic consumers of the relatively small feed grain crop this year. The nation's feed grain crop has been estimated at 175 million tons, or 15 percent less than a year ago, as a result of extremely dry weather.¹ Production this year plus an estimated carryover of 22 million tons totals 198 million tons available for domestic use plus exports. This is 16 percent less than the total last year. The quantity of wheat and other concentrates available for feed plus exports is no greater than last year, thus there are no offsetting gains from these feed sources.

Exports of feed grains have risen sharply in recent years and accounted for 43.7 million tons or 20 percent of total usage last year. Such exports were up 50 percent from the 1972 level and 150 percent from 1971.

As a consequence of the sharp decline in the quantity of feed grain available and the prospects for large exports again this year, proposals have been made to establish export quotas.² Such quotas would limit exports to levels below those determined by market forces and increase the quantity of grain available to feed domestic animals. One writer argued that the establishment of export quotas "offers the only way in which the present food and feed situation can be fairly dealt with. It amounts to protection, on a reasonable basis, of the interests of the United States; timely warning to foreign claimants; and the establishment of fair and equitable access for them to a generous share of total U.S. supplies."³

¹Short tons (2,000 pounds) of corn, sorghum grain, barley, and oats.

²For example, see "Government Weighs Grain Export Curbs . . .," *The Wall Street Journal*, 14 August 1974; "Midwest Drought: Economic Time Bomb," *U.S. News and World Report*, 26 August 1974; "World Trade," *New York Journal of Commerce*, 22 August 1974; and "Butz Sees the Light," *The Commercial Appeal*, 24 August 1974.

³J. Hans Richter-Allschaffer, "Farm Exports: Toward Timely Controls," *New York Times*, 4 September 1974, p. 38M.

THE SHORT-RUN VIEW

Grain export controls, as implied in the proposed quotas, could serve the nation with tolerable satisfaction in the short run. Such actions are simple and direct, and thus tend to appeal to many people. Direct export controls would have an early impact on the domestic food supply. The nation possesses a given amount of grain, and the less that is exported, the greater would be the amount available for domestic use. An increase in the quantity available for domestic use would tend to lower domestic grain prices, increase livestock feeding, and increase output of beef, pork, poultry, milk, and eggs, thus reducing food costs. Early results are assured in terms of smaller increases in food costs to domestic consumers than would have otherwise occurred, and this is the overriding factor to the proponents of export quotas.

Quotas Might Reduce Returns to Producers and Domestic Consumers

The early gains to consumers in terms of lower food prices is not the whole story, however, even in the short run. A decrease in feed grain exports resulting from the imposition of quotas might have an unfavorable impact on the incomes of grain producers and on the prices of imports. Given a relatively fixed quantity of grain following harvests, changes in the market price until the next harvest year largely reflect changes in demand conditions in the United States and abroad. If exports were limited by quotas the effective demand for U.S. grain would be less, and domestic prices would be lower. If the effects of lower domestic prices were not offset by higher returns from exports, gross returns to grain producers would decline.⁴

⁴Grain producer incomes could rise in the short run provided an export quota system is applied to each producer and foreign demand for U.S. grain is inelastic — that is, low cost feed grain substitutes are not available.

At the same time, the imposition of quotas could reduce the volume of imports available to domestic consumers. A reduction in the amount of grain available in world markets would raise world grain prices. Depending upon the availability of substitutes, total expenditures on U. S. grain by foreign buyers might either increase or decrease.

If relatively low-cost substitutes are available, then the increase in grain prices would be relatively small and would not offset the decrease in the quantity sold; total expenditures by foreign buyers of U. S. grain would decline. Any such reduction in total expenditures by foreign purchasers of U. S. grain would result in a decline in the demand for dollars and a decrease in the international value of the dollar. This would imply that the domestic price of our imports would rise. Consequently, the imposition of quotas would increase prices to U. S. consumers of imported commodities and those commodities which use imports as inputs to production. The gain to U. S. consumers in terms of reduced food prices could then very well be offset by an increase in the prices of other commodities. In this case there is a loss sustained by U. S. consumers and grain producers and a gain by producers of other exports.

If low-cost substitutes are not available, however, total expenditures by foreign grain purchasers would increase. An increase in total foreign expenditures in the United States would lead to a rise in the exchange rate and thus a lowering of the domestic price of imports and a rise in the foreign price of U. S. exports. If substitutes are available for our other exports, then U. S. exporters of these goods would incur losses. As a result, domestic grain producers and domestic grain consumers gain at the expense of other U. S. exporters and foreign consumers.

Thus, consumers in the United States would stand to gain in the short run from the controls only if demand for grain in the world market were inelastic — that is, if few grain substitutes were available and the reduced quantity of grain were sold to foreign purchasers for more dollars.

Another consideration in the imposition of quotas is that they might induce retaliation. Suppose, for example, that oil-producing nations decided to retaliate by imposing quotas on their oil exports to the United States. This would raise the domestic price of oil, and again, U. S. consumers could be worse off than before.

The above analysis indicates that in the short run the net effect of the quotas could be a decrease in the quantity of imports and an increase in the quan-

tity of grain available to consumers in the United States. One should be reminded, however, that if feed grains were more valuable to domestic consumers than the imports, the market itself would guarantee that no grains would be exported. In other words, if domestic consumers were willing to pay more for grain than for products from abroad, grain producers would be able to sell their grain for higher returns in the United States than in the world market. In this context, instead of purportedly increasing consumer well-being, the imposition of export quotas, even for a period of one year, would actually decrease well-being.

THE LONG-RUN IMPACT

In contrast to the possibility of some short-run gains to domestic consumers from grain export quotas, over the longer run such quotas would be harmful to both domestic and foreign consumers. Given time for retaliatory policies and resource adjustments, export quotas on grain would, in the long run, tend to: (1) reduce grain exports; (2) reduce domestic grain production; (3) decrease domestic farm incomes; (4) reduce the overall quantity of goods and services produced, thereby lowering the well-being of consumers in the United States and the rest of the world; and (5) cause further increases in domestic prices.

Reduces Grain Exports

In addition to their immediate impacts, export quotas which limit the quantity of grain exported in the current year would tend to reduce the value of future grain exports. For example, if the United States permits grain importing nations free access to our grain markets only during years when production is equal to or above the trend level, this nation would cease to be a dependable source of grain supplies. Consequently, those nations which have heretofore depended on the United States for a portion of their grain would likely take action to assure a relatively stable supply, rather than depend on U. S. imports on an intermittent basis. Food consumption habits develop over a period of years and do not change readily for the convenience of such on and off trade.

Grain importing nations could provide for alternative sources of grain supplies in several different ways. They could increase their own production in the long run because of the increase in the cost and unreliability of U. S. grain. They might also negotiate bilateral trade agreements with other grain producing nations for a greater portion of their grain supply. Such agreements might be accompanied by protective

tariffs and import restrictions applied during the years that this nation had larger than average supplies, or had surpluses if price supports were used to prevent price declines. Either of the above routes to a more dependable source would ultimately result in less U. S. grain exports and a corresponding reduction in imports of foreign goods and services.

Reduces U.S. Grain Production

If the quotas were at all effective, they would result in lower domestic grain prices and, therefore, in decreased production. Since farmers operate under competitive conditions, they produce at the level where the estimated cost of producing the last unit of output is equal to the projected price. Production of additional units entails higher per unit costs of production, and a decrease in price caused by export quotas implies that some of the output is being produced at a loss unless the producer anticipated the lower prices at the time of planting. Consequently, each farmer would reduce production and total grain output would decline.

From the domestic consumers' point of view, such a decline in production is not objectionable. He would get a somewhat larger quantity of grain at a marginally lower price than otherwise. Hence, the direct burden of reduced U. S. grain output would be borne by foreign consumers who receive less grain at higher prices and domestic grain producers who would incur capital losses as resources were transferred from the production of grain to the production of other products. But, as will be seen later, there are secondary effects which would work towards reducing the well-being of U. S. consumers.

Another factor which tends to reduce production under a quota regime is the greater price risks taken by producers. Under export controls the price signals received by producers reflect not only world supply and demand conditions but also the uncertainty with respect to the restrictions. The political forces which determined the controls would be the result of compromises between feed grain producers, feed users, and consumer groups. The result of such compromises and their impact on prices is difficult to predict. Hence, producers and farm credit suppliers would have to make allowance for these additional risks in their production and lending plans.

Reduces Farm Incomes

Farm incomes would be less under export quotas than with free trade. The lower prices per unit re-

ceived for grain combined with a reduction in grain output would probably result in a sizable decline in gross sales. Consequently, incomes to grain producers and returns to their resources would decline.

Reduces Well-Being for U.S. and World Consumers

In the discussion of the short-run effects of the imposition of grain export quotas, the possibility of a decline in the well-being of U.S. consumers was discussed. The possibility exists because of a potential increase in the prices of imports. In the long run, instead of just the *possibility* of a loss, the loss becomes a certainty. If quotas were effective, grain production and grain exports would decline. In the short run, domestic consumer gains or losses would depend on whether foreigners could find substitutes for our grain. In the long run, substitutes are always available and the quotas would result in trade losses.

The losses occur because in the long run our foreign currency earnings would decline and we would be able to buy less foreign products, such as oil, sugar, coffee, and raw materials for the manufacture of steel and aluminum. Again, one could make an argument that a decline in the domestic price of grain would offset the increase in the price of oil and other imported products, and that domestic consumers would be as well off with the export quotas as prior to their imposition. This reasoning, however, completely overlooks the source of the foreign trade gains. Why, for example, was the United States producing wheat in the first place and exchanging it for oil rather than producing all of the oil that the nation consumed? The simple answer is that by producing wheat and trading it for oil we gained wealth. That is, the process used up less of our resources than if we had taken resources used in the production of wheat and used them to increase the production of oil. Through trade we have obtained more oil and more wheat than we could acquire by attempting to become self sufficient in the production of both wheat and oil.

This is the fundamental reason for all specialization and for all trade, domestic and international. Individuals, as well as countries, have different natural and technological endowments, and by specializing in the production of some goods and services and exchanging them for others, they can increase the total amount of all products that are available for consumption.

Despite the artificial quadrupling of oil prices by the oil producers' cartel, it may still be cheaper to ex-

change grain for oil than to produce additional quantities of oil domestically. An imposition of quotas would shift our resources from the production of grain to the production of oil and we would thus forego the savings accrued from exchange. The opposite shift would take place in foreign countries. As a result, all consumers, both domestic and foreign, would be worse off.

Thus, what appears to many people as a reduction in food prices and an increase in the welfare of U. S. consumers from the establishment of grain export quotas, actually becomes a net loss. This country has opposed the imposition of artificial restrictions on oil output by the oil-producing countries. It is argued that such restrictions could cause a worldwide decline in the standard of living. Yet, some analysts are proposing that the United States practice the same tactics and the same consequences would likely be in prospect.

Increases Domestic Prices

Grain export controls over the long run would tend to cause the domestic price level to be higher than would have prevailed without the controls. To the extent that the controls reduced international specialization of production and exchange of goods, they would reduce the total quantity of goods available to consumers in both the United States and foreign countries. This reduction in supply, assuming no offsetting change in the rate of monetary growth, would cause higher prices. Thus, instead of contributing to a lower rate of inflation, as contended by some of the proponents, export controls would actually cause further price increases.

CONCLUDING SUMMARY

The quantity of feed grain available for domestic use plus exports is down this year from the level of a year ago. The decline will tend to reduce livestock feeding and cause higher food prices.

Proposals have been made to limit feed grain exports through export quotas to avoid the upward pressure on food prices from the reduced grain supplies. This proposed solution is simple and direct, and may appeal to many people. However, such quotas could actually reduce the economic well-being of the nation in the short run and would certainly reduce well-being over a longer period.

In the short run domestic food prices would be lower with the quotas than without them. However, depending on whether or not there are substitutes for U. S. grain in foreign markets, the prices of U. S. imports could rise significantly. As a result, U. S. consumers could end up with more grain and fewer imports than they would have in a free exchange system. In such a situation, both this nation and grain importing nations would lose as a result of the quotas. In addition, the quotas might trigger some harmful retaliatory measures by foreign nations, such as the actions of the oil cartel last year.

Over the longer run, export quotas would be even more damaging than in the short run. In the long run they inhibit domestic grain production and reduce domestic farm incomes. But of greater importance, they reduce the long-run gains from international specialization, thereby greatly reducing the overall output of goods and services, the well-being of consumers, and cause further price increases in both this nation and abroad.

