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Economic Review is published quarterly by the Research Department of the Federal Reserve Bank of Cleveland. Copies of the issues listed here are available through our Public Information Department, 216/579-2047.

Editor: William G. Murmann
Design: Michael Galka.
Typesetting: Liz Hanna.

Opinions stated in Economic Review are those of the authors and not necessarily those of the Federal Reserve Bank of Cleveland or of the Board of Governors of the Federal Reserve System.

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ISSN 0013-0281

Exchange-Market Intervention: The Channels of Influence

by Owen F. Humpage

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The author would like to thank Gerhard Rosegger, David Bowers, Asim Erdilek, Nicholas Karamouzis, Ralph W. Smith, Jr., Alan Stockman, James G. Hoehn and William T. Gavin for helpful comments.

Introduction

The major developed countries abandoned the Bretton Woods system of fixed exchange rates in March 1973 in favor of a system of more generalized floating rates. Over the 13 years since the adoption of floating exchange rates, however, governments generally have refused to allow the private market free rein in determining the foreign-exchange values of their currencies. They frequently have intervened in the foreign-exchange market to influence outcomes. The frequency and intensity of intervention has varied greatly over the years and among the countries. Most noticeable has been a sharp reduction in the intervention activity of the United States since early 1981. This reduction reflected a growing realization that exchange-market intervention, conducted independently of monetary policy, had only a limited effect on exchange rates.

Economic theory suggests three possible channels through which exchange-market intervention could alter exchange rates: the monetary channel, the portfolio-balance channel, and the expectations channel. The monetary channel allows intervention to influence exchange rates by altering the relative growth rates of nations' money stocks. There is little disagreement about the potency of such intervention; in fact, central banks can maintain fixed exchange rates through relative changes in their money stocks.

Central banks, however, have sought a means to influence exchange rates independent of their monetary policy. Portfolio-balance models of exchange-rate determination

offer such a channel. According to this approach, intervention that alters the relative stock of domestic and foreign currency denominated government debt could influence exchange rates in a manner consistent with the objectives of the intervening monetary authority. The portfolio model seemed to offer support for frequent intervention as conducted during the 1970s by the United States. Although not conclusive, subsequent empirical work has cast doubt on the ability of central banks to influence exchange rates through the portfolio-balance channel. This research, however, has left open the possibility that intervention can influence exchange rates by providing new information to the exchange market. In a highly efficient market, however, the instances when the monetary authority has better information than the market are few. The belief that intervention operates largely through the expectations channel forms the basis for the limited use of intervention by the United States in the 1980s.

Recent attempts to encourage an orderly depreciation of the dollar from its record levels in exchange markets have renewed interest in the feasibility of frequent exchange-market intervention. Consequently, this article surveys the literature on intervention for readers who are not necessarily specialists in international finance. After providing a definition of intervention and a discussion of why countries intervene, we focus on the theoretical channels through which intervention might alter exchange rates. Box 1 provides a bibliographic guide to many of the empirical studies on intervention.

I. A Definition

Exchange-market intervention refers to official purchases and sales of foreign exchange, which nations undertake to influence the exchange value of their currencies. This definition describes intervention in terms of two criteria: the types of transactions and the motives guiding those transactions.

The distinction among various types of transactions is important because countries have many policy levers with which to affect the exchange value of their currencies. They can alter monetary and fiscal policies, institute broad

or selective capital controls, or resort to various trade barriers. Almost any government policy can have exchange-rate repercussions in a floating exchange-rate regime with a high degree of integration among nations' capital and goods markets. The purchase and sale of foreign exchange, however, is the most direct and most flexible lever through which to affect exchange rates. It is, therefore, the most frequently used intervention device.

Usually a nation's central bank or exchange-stabilization fund conducts its interven-

Some Empirical Studies of Intervention

Argy (1982) investigates the profitability of intervention by Japan, West Germany, and the United Kingdom, emphasizing the need to adjust for the accumulation or diminution of foreign-exchange inventories. He finds mixed results, depending on the time period chosen and on the specific country.

Bagshaw and Humpage (1986) find that the decision to cease systematic intervention from April 1981 to March 1982 generally had no effect on the volatility of exchange rates, as measured by the parameters of a stable Paretian distribution.

Danker, Haas, Henderson, et al. (1983) investigate intervention by Germany, Japan, and Canada using monthly and quarterly data in a portfolio-balance model that differentiates between bank and nonbank demands for bonds, and which incorporates rational and static expectations.

Greene (1984a) argues that intervention from January to March 1975 successfully broke a string of almost continuous declines in the dollar. The studies seems to illustrate the importance of coordinated intervention.

Greene (1984b) suggests that intervention, although effective on certain occasions, could not over-

whelm the influence of market fundamentals and sentiments promoting a rapid dollar depreciation from September 1977 to December 1979.

Greene (1984c) investigates intervention from October 1980 to September 1981. She does not find strong evidence of an increase in exchange-rate volatility after the United States ceased intervention in February 1981.

Humpage (1985) constructs a daily time-series model of U.S. intervention (November 1, 1978 to October 31, 1979) suggesting the United States attempted to smooth unanticipated exchange-rate movements but found no evidence of the expected exchange-rate response.

Hutchison (1984) develops a portfolio-balance model of Japanese intervention and concludes that Japanese intervention would need to be massive to affect the yen-dollar exchange rates appreciably.

Jacobson (1983) calculates the profitability of U.S. intervention, showing the problems of evaluating inventories of foreign exchange. The results are mixed.

Loopesko (1983) tests for a systematic relationship between intervention and unexploited interest arbitrage profits, using daily data on six major currencies against the dollar. About half the cases do not support a portfolio-balance channel.

Mayer and Taguchi (1983) investigate the profitability of German, Japanese and British intervention, emphasizing the need to adjust for interest earnings on foreign exchange reserves. They develop a rule for assessing a leaning-against-the-wind intervention strategy.

Pippenger and Phillips (1973) find that Canadian intervention during the Canadian float (1952 to 1960) reduced day-to-day fluctuations in exchange rates; the study uses daily data and spectral analysis.

Rogoff (1984) investigates Canadian intervention within a portfolio-balance framework with weekly data, but finds no evidence that intervention operates through this channel.

Taylor (1982a, 1982b) calculates the profitability of intervention by the major developed nations under floating rates and finds that nearly all countries experienced losses over the period. For many countries, and for the group as a whole, the probability of experiencing similar large losses through random intervention was very small.

Tryon (1983) provides a review of empirical models of intervention that utilize the portfolio-balance framework

Wilson (1982) discusses the empirical difficulty of making profit comparisons.

tion. Some governments occasionally have directed banks and public or private corporations to carry out exchange-market transactions and have subsidized such transactions (see Jurgensen [1983]). Although difficult to identify, these transactions constitute intervention.

Central banks *can* intervene in either the spot-or forward-exchange market. Because covered interest arbitrage links the spot and forward markets, intervention in either market could affect both exchange rates. Most central banks, however, show a preference for spot-market intervention.¹

An understanding of the motives for buying or selling foreign exchange is a necessary component of the definition of intervention. While all official purchases and sales of foreign exchange place pressure on exchange rates, this is not always the purpose of such transactions. Central banks often buy or sell foreign exchange for customers, usually the home-country government, which otherwise would undertake the transactions through normal commercial channels. The home-country government might use the funds to repay official foreign-currency debts or to purchase military equipment. Central banks also buy foreign currency to build up or to replenish foreign-currency reserves. Sometimes central banks enter the exchange markets to convert interest payments on foreign reserves (which are paid in foreign currency) into domestic currency. Such transactions would not seem to constitute intervention according to a strict interpretation of our definition.

Unfortunately, the distinction is not always very clear. Adams and Henderson (1983) discuss this issue and note that such transactions often constitute a type of "passive intervention." Central banks *can* conduct commercial transactions in a manner consistent with the overall aims of their intervention policy. Adams and Henderson favor a broader definition of intervention and would characterize a transaction as intervention if it altered the currency composition of assets in the hands of the public from that which otherwise would have resulted had all transactions occurred through normal commercial channels.

II. Sterilized and Nonsterilized Intervention

Central-bank intervention in foreign-exchange markets *can* be *sterilized* or *nonsterilized*.² Sterilized intervention refers to purchases and sales of

foreign exchange whose impact on the home country's money stock is offset through domestic open-market operations. Nonsterilized intervention refers to purchases and sales of foreign exchange whose effects on the money stock are not offset by the home country's monetary authorities. If sterilized intervention is effective, it gives the intervening country a policy tool, independent of monetary or fiscal policy, with which to alter the exchange rate; hence, the interest in sterilized intervention.

The important distinction between sterilized and nonsterilized intervention is illustrated in table 1, which presents a consolidated balance sheet for a hypothetical central bank. On the asset side of the ledger are net foreign assets (NFA), which consists of foreign reserves less liabilities to foreign official holders, and domestic assets (DA), which consists primarily of loans to depository agencies and government securities. On the liability side is the monetary base (MB), which consists of currency in the hands of the public and reserves in the banking system. Both sides of the ledger must balance. Consequently, the balance-sheet identity is:

$$NFA + DA = MB.$$

When a central bank intervenes in the exchange market, buying or selling foreign assets (NFA), two things happen: First, the composition of its assets changes; that is, NFA/DA rises or falls. Second, the monetary base changes by an amount equal to the change in net foreign assets; that is, $\Delta MB = \Delta NFA$. The change in the monetary base results from the balance-sheet identity and leads to a multiple change in the domestic money stock.

If the change in the money stock resulting from intervention is not consistent with the central bank's domestic monetary-growth objectives, the central bank could offset (sterilize) the effect on its money stock of a change in its net foreign assets. The intervention authority can sterilize intervention by buying or selling domestic assets through open-market operations, or by making loans to depository institutions through discount-window operations until:

$$\Delta NFA = -\Delta DA$$

Sterilized intervention involves only an asset-composition effect. It is a stronger asset-composition effect than nonsterilized intervention, because it involves changes both in net foreign assets and in domestic assets. Nonsterilized intervention involves both an asset-composition effect and a money-supply effect. Consequently, nonsterilized intervention is ana-

1 The reluctance to intervene forward might reflect a fear that, if the situation necessitating intervention persists at the time the forward contracts mature, a central bank could find that the volume of intervention necessary to defend its currency has increased greatly. Essentially, it must offset past pressures, as well as any new pressures. See Tsiang (1959).

2 Adams and Henderson (1983), Batten and Ott (1984), Genburg (1981), and Jurgensen (1983) also discuss the distinction between sterilized and nonsterilized intervention.

lytically indistinguishable from sterilized intervention, plus a change in monetary policy.

Sterilized intervention *can* be complete or partial. Even when the home country sterilizes the impact of intervention on its currency unit for unit, the transaction *can* alter the money stock of the foreign country whose currency was purchased or sold. The foreign country also can sterilize the impact of home country intervention on its money stock through the instruments of its domestic monetary policy. In addition, either the home or the foreign government can elect not to offset intervention unit for unit.

III. Why Do Central Banks Intervene?

According to official publications, governments intervene to "calm disorderly exchange markets." Yet, no clear definition of what constitutes a disorderly exchange market exists, and the official perception of disorder seems to vary among central banks and over time. The experience with floating exchange rates, however, suggests two broad reasons for exchange-market intervention: First, exchange-rate movements can have important macroeconomic implications; nations have viewed intervention as a means of **influencing** these movements independently of monetary and fiscal policies. Second, governments view exchange markets as periodically inefficient, justifying market intervention.

Exchange rates are the price of one nation's monetary unit in **terms** of another nation's monetary unit. They are endogenous variables; that is, exchange rates respond to changes in other economic variables such **as** monetary and fiscal policies at home or abroad. Because exchange rates are endogenous variables, one cannot easily ascribe causality to exchange-rate movements. The record appreciation of the dollar from 1980 to 1985, for example, seemed to reflect the huge increase in federal borrowing associated with the budget deficit. Was it then the dollar or the budget deficits that contributed to the deterioration in the trade balance since 1982?

Nevertheless, policymakers often seem to view exchange-rate movements **as** exogenous events. One possible explanation for this view is that developments in foreign countries, beyond the control of the home-country government, *can* produce exchange-rate movements. From this perspective, exchange-rate movements appear responsible for altering the relative prices of goods, services, and financial assets in one country vis-a-vis other countries. These relative price changes *can* have important influences on real economic growth, employment, and prices in the aggregate national economy or in specific sectors. Consequently, despite the adoption of floating rates, nations have continued to regard exchange rates as important policy targets and, in **varying** degrees, have attempted to manage their exchange rates. From this perspective, central banks found intervention, especially sterilized intervention, interesting. It seemed to offer nations an "additional" policy variable with which to influence exchange rates, while leaving monetary and fiscal policy **free** to pursue domestic economic objectives.

Monetary authorities have not taken this view to the extreme; that is, they have not attempted to peg an exchange rate with sterilized intervention.³ Nor did they regard monetary policy as irrelevant in determining exchange rates. Nevertheless, policymakers appeared to

Monetary Authority's Balance Sheet

| Assets | Liabilities |
|----------------------------------|-----------------------------|
| <u>Net Foreign Assets (NFA)</u> | <u>Monetary Base (MB)</u> |
| Gold | Currency in hands of public |
| Foreign currency | Reserves |
| SDR | |
| Net position in IMF | |
| <u>Domestic Assets (DA)</u> | |
| Government securities | |
| Loans to depository institutions | |
| Other | |

TABLE 1

Many foreign countries lack money markets with sufficient breadth to offset intervention on a continual basis. Some sterilize through changes in their discount rate or their reserve requirements. Some, like Switzerland, use foreign-currency purchases and sales to execute domestic monetary policy. **As long as** countries attain their monetary objectives in the face of intervention, we can conclude that they have neutralized the monetary effects of intervention (see Jurgensen [1983]).

Completely sterilized intervention is analytically equivalent to a trade of public securities denominated in home-country currency for securities denominated in foreign-country securities. It results in a change in the currency composition of securities held by the public, the mirror image of which is a change in the currency composition of assets held by the central banks. When the United States and Germany conduct completely sterilized intervention to support the dollar vis-a-vis the mark, for example, they reduce (increase) the amounts of U.S. government obligations held by the public (Federal Reserve System) and increase (decrease) the amount of German government bonds held by the public (Bundesbank).

believe that through sterilized intervention they could influence the speed at which exchange rates adjusted. This view is evident in the fact that many central banks have intervened frequently, often following a strategy of leaning against the wind (see Jurgensen [1983]).

Since the early 1980s and the findings of the Jurgensen Report, the proposition that sterilized intervention offers an independent policy lever with which to affect exchange rates has not found wide acceptance. As the next section discusses more fully, the preponderance of research suggests that intervention probably has a very limited, if any, *independent* influence on exchange rates. Nevertheless, many policymakers believe that intervention, when undertaken in conjunction with other (monetary) policies, affords a market impact substantially greater than one would expect from the sum of the two policies taken independently. That is, intervention can augment monetary and fiscal policies. As the Jurgensen Report noted:

... most members felt that the impact of the simultaneous application of the two instruments exceeded their individual effects. In other words, these members argued that exchange market intervention and monetary policy changes reinforced each other and thus enhanced the size and duration of their respective effects (pp. 20-21).

Extending this view, many argue that coordinating international monetary, fiscal, and intervention policies also augments their individual effectiveness.

The preceding discussion assumes that policymakers want to change the exchange rate in order to achieve some macroeconomic objective; it also assumes that exchange markets are efficient. However, the second general reason for intervention is that policymakers regard exchange markets as not always efficient. Because of inefficiencies, exchange rates can become "misaligned" or exhibit excessive volatility or both. &change-rate misalignments and volatility can impose real resource cost on all nations, affecting economic growth, employment, and prices.⁴ As the Jurgensen Report illustrates, monetary authorities often have intervened to "dampen erratic fluctuation," to "calm disorderly markets," or to "keep exchange rates in line with fundamentals." All these suggest that something is wrong with the market and that the monetary authority is capable of correcting the deficiencies.

3 The European Monetary System comes the closest to using intervention to peg an exchange rate. However, it is not clear that EMS intervention is routinely sterilized and therefore independent of monetary policy.

4 For a discussion of the effects of exchange-rate volatility, see International Monetary Fund (1984).

IV. The Channels of Influence

Economic theory offers three possible channels through which foreign-exchange-market intervention could influence exchange rates. First, non-sterilized intervention and, to a lesser extent, partially sterilized intervention alter the relative supplies of domestic and foreign money. These monetary shifts could affect relative interest rates, relative price levels, and exchange rates. Second, sterilized intervention alters the relative supplies of government interest-bearing debt held by international investors. Any resulting portfolio adjustments could affect exchange rates. Third, both sterilized and nonsterilized intervention could alter expectations in the foreign-exchange market. Exchange rates, like all asset prices, are very sensitive to changes in market participants' expectations. This section discusses each of these possible channels of influence.

A. The Monetary Channel

Economists have recognized a relationship between changes in countries' monetary-growth rates and changes in their exchange rates (or balance of payments under fixed exchange rates) at least since Hume's price-specie-flow doctrine.⁵ Although international economists might disagree about the relevant time frame and relative importance of money in exchange-rate models, few would object on theoretical grounds to the inclusion of money among the determinants of exchange rates. Most recent models of exchange-rate determination either include relative money growth rates among their arguments, or represent the reduced form of models whose structural forms include money.⁶

Under classical assumptions of the neutrality of money and of the constancy of velocity in the long run, a given percentage increase in a nation's money stock will result in a similar percentage increase in that nation's price level. Given purchasing-power parity, that nation also will experience a depreciation of its nominal exchange rate equal to the percentage rise in its price level. The real exchange rate remains unaffected.

While economists have challenged the strict versions of classical assumptions and have observed that purchasing power parity need not hold strictly even in the long run, the tenet that relative rates of money growth are important determinants of nominal exchange rates continues. In fact, one current approach to exchange-rate

5 Keynesian economics did not emphasize the role of money in balance-of-payments adjustment problems; rather it focused on the elasticities approach and later the absorption approach. One can trace the recent re-emphasis on money, at least, to Johnson (1968).

6 For a recent survey of approaches to exchange-rate determination, see Schafer and Loopesko (1983).

determination, the monetary approach, views relative patterns in the supply of and demand for nations' money as the key determinant of exchange rates?

Modern approaches differ from historic treatments in that they allow for instantaneous adjustment in asset markets through a rational-expectations framework, and they allow for sticky prices in goods markets. One important consequence of these assumptions is that the channel of influence between monetary changes and exchange-rate movements does not necessarily run through relative prices and trade flows, as in the classical models. Modern approaches to monetary theory allow, at least in the short run, for influences of money on interest rates, and exchange rates through an interest-rate parity mechanism. Contemporary models suggest that a change in relative monetary growth rates will produce both nominal and real exchange-rate changes in the short run, but not in the long run. Another important implication of modern models is that, following a monetary expansion, nominal exchange rates initially can overshoot their long-term equilibrium value (given by purchasing power parity) because of the slow adjustment in goods prices. The extent of the overshoot will depend on all the interest elasticities and price elasticities embodied in the model. However, if goods prices adjust instantaneously, no exchange rate overshooting will result.⁸

Nonsterilized intervention, which changes nations' relative money supplies, has the potential to alter exchange rates rapidly and lastingly. International economists rarely disagree with this proposition. Sterilized intervention, as typically conducted by the United States, also could have an effect on exchange rates if foreign monetary authorities did not completely sterilize the transactions.

As indicated earlier, U.S. intervention to alter the dollar's exchange rate can change the money stocks of the nations whose currencies the Federal Reserve buys or sells, unless those nations take appropriate offsetting actions. The major developed countries, such as Germany and Japan, can sterilize the effect of foreign or domestic intervention on their money stocks. Smaller developed and developing countries often lack credit markets with sufficient depth to undertake such sterilization activities on a routine basis through open-market operations. They can undertake reserve-ratio changes or discount-rate

changes, but these have a fairly dramatic impact on monetary growth and are not well-suited for routine adjustments to sterilized intervention. They do, however, provide a mechanism whereby the foreign central bank could offset the impacts of intervention over a longer period.

B. The Portfolio-Adjustment Channel

Economists have extended the closed-economy, portfolio-balance models of asset demand, initially developed by Tobin (1958, 1969), to the open-economy case. In a portfolio model of asset demand, risk-averse wealth holders, facing uncertain rates of return on an array of assets, diversify their portfolios across assets instead of holding only the single asset currently yielding the highest rate of return. When exchange risk and political risk are introduced into the model, a strong incentive exists for wealth holders to diversify their portfolios across currencies.⁹ The resulting demands for assets denominated in foreign currencies affect exchange rates. The open-economy portfolio model illustrates an important channel through which completely sterilized intervention might affect exchange rates and the conditions that must hold for sterilized intervention to work.

In a world with no transaction cost and no restraints on capital flows, arbitrage will equate returns on assets denominated in dollars with returns on assets denominated in other currencies:

$$(1) \quad r = r^* + f - s$$

In equation 1, r is the log of the interest return on U.S. bonds and r^* is the log of the interest return on foreign bonds. (We assume that the bonds mature in one year.) The forward exchange rate, f , is the log of the current dollar price of foreign currency for delivery in one year. The spot price of foreign currency is s .¹⁰ Assuming that domestic and foreign assets are perfect substitutes, so that the forward exchange rate equals the expected future spot exchange rate, arbitrage ensures that the return on domestic bonds, equals r^* , the return on foreign bonds, plus any capital gains associated with holding foreign-currency-denominated assets as exchange rates change.

When wealth holders do not view domestic and foreign bonds as perfect substitutes, the forward exchange rate will differ from

7 For examples of the monetary approach to exchange-rate determination see Frenkel (1976) and Bilson (1978).

8 The overshooting model is attributable to Dornbusch (1916)

9 Initial applications of portfolio models to the study of capital movements under fixed exchange rates are Branson (1970), and Kouri and Porter (1974). Early applications to floating exchange rates include Gorton and Henderson (1977) and Kouri (1980). Discussions of sterilized intervention within the context of portfolio models are found in Tryon (1983), Genburg (1981), Henderson (1984), and Hutchison (1984).

10 Equation 1 is the log form of the covered interest-rate parity condition:
 $(1 + r) = f/s (1 + r^*)$

the expected future exchange rate (\bar{s}^e) by a premium, θ , that reflects the risks associated with holding an open position in dollars. That is:

$$(2) \quad f - s^e = \theta.$$

Substituting yields:

$$(3) \quad r = r^* + (s^e - s) + \theta.$$

As can be seen from equation 3, wealth holders demand an extra return for holding the risky dollar asset above the interest return and expected appreciation from holding the foreign bond. (One could specify the problem with the foreign asset as the risky asset without affecting the analysis.)

Rearranging equation 3 provides an expression for the risk premium:

$$(4) \quad \theta = r - r^* + s - s^e.$$

With interest rates and the expected future value of the dollar held constant, an increase (decrease) in the risk premium on dollar assets is associated with a depreciation (appreciation) of the dollar relative to the foreign currency. This depreciation of the dollar in the spot market is necessary to give wealth holders a capital gain over the holding period sufficient to compensate them for the additional risks of holding dollar-denominated assets.

Before explaining intervention within the context of this model, we should specify the determinants of the risk premium. Underlying the risk premium is the preference of individuals to hold assets in their home currency, an aversion to risk, and a desire to hold assets which maximize a return from a portfolio, given the risks. These risks include exchange risk (the uncertainty associated with unanticipated movements in exchange rates) and political risk (the probability that governments will impose future capital controls). In the case of major developed countries, most analysts attach greatest importance to exchange risk (see Dooley and Isard [1980] and Frankel [1979]). In specifying a function to explain the risk premium, most research includes, among other terms, the ratio of domestic bonds to total wealth (see Frankel [1984, 1979] and Hutchison [1984]).

The assets relevant to the portfolio balance model are government bonds. Individuals generally do not hold large balances of foreign currency, since they would earn no interest. In addition, bondholders must view the bonds as additions to their net wealth. Private bonds are assets to lenders and liabilities to borrowers; therefore, they do not represent net additions to wealth. Government bonds will equal net additions to wealth if bondholders do not associate with an increase in government debt a future tax liability sufficient to retire the debt and all interest accrued on the debt (see Barro [1974]).

The portfolio balance model provides a channel through which sterilized intervention can alter exchange rates *permanently* since, as demonstrated earlier, sterilized intervention alters the relative supplies of domestic and foreign government bonds in the hands of the public and, when the bonds are imperfect substitutes, alters the risk premium. Assume, for example, that the United States intervenes in the foreign exchange market to support the dollar relative to the German mark. The Federal Reserve buys dollars in the foreign exchange markets with German marks and sterilizes the intervention by buying Treasury bonds at the open-market desk. Assume that Germany also sterilizes by selling mark-denominated bonds. The Federal Reserve's purchase of Treasury securities initially creates an excess demand for Treasury securities that tends to lower U.S. interest rates, while the German sale of mark-denominated bonds creates an excess supply and tends to raise German interest rates. Because U.S. and German bonds are not perfect substitutes, U.S. bondholders are not willing to hold all of the excess supply of German bonds. The interest-rate movements tend to increase U.S. money demand and to lower German money demand. Yet, the money supplies in both countries have remained unchanged. With the expected future spot rate constant, the dollar will appreciate relative to the German mark.¹¹ The exchange-rate change, which occurs as money-demand shifts alter the terms of trade, is necessary to restore balance in both the money and bond markets. The appreciation of the dollar relative to the German mark reduces the attractiveness of domestic bonds relative to mark bonds by increasing (decreasing) the expected future depreciation (appreciation) of the dollar relative to the mark, hence, it also reduces expected capital gains on dollar assets.

In terms of equation 4, therefore, intervention has produced movements in interest rates and the spot exchange rate associated with a reduction in the risk premium on dollar assets. The movement in the exchange rate, moreover, is compatible with the designs of the intervening monetary authorities.

If assets are perfect substitutes, wealth holders expect the same return from each bond. Under these assumptions, sterilized intervention will not affect the exchange rate, because individuals have no incentive to alter portfolios given a change in the relative stocks of bonds. Asset holders are perfectly willing to hold more mark-denominated bonds in place of dollar-

11 Analysts usually assume that long-term determinants, such as purchasing power parity, or a sustainable current account deficit, maintain the level of s^e .

denominated bonds in their portfolios. When the bonds are perfect substitutes, intervention also will leave interest rates unaffected because the intervention transactions, although altering the currency composition of bonds, have not changed the total value of bonds relative to money in portfolios. Wealth holders, therefore, have no incentive to diversify out of bonds and into money.

Given the other assumptions mentioned previously, the extent to which intervention alters exchange rates depends on the degree of substitutability between dollar-denominated and mark-denominated securities. Other things equal, if dollar and mark bonds are close substitutes, the change in the exchange rate will be small. If the assets are not close substitutes, a larger change in the exchange rate will be required to compensate for the risks. This implies that completely sterilized intervention might be feasible in some markets where assets are imperfect substitutes, but infeasible in other markets, where assets are perfect substitutes.¹² Therefore, the United States might intervene successfully against lira but not against marks. Clearly, one must evaluate the portfolio effects of completely sterilized intervention on a case-by-case basis.

Empirical investigations to date generally do not find strong support for the contention that intervention affects exchange rates through a portfolio-adjustment mechanism (see box 1). Although the issue remains unresolved, the evidence of the existence of a risk premium between similar assets denominated in currencies of different major developed countries is mixed.¹³ These investigations involve simultaneously testing the joint hypothesis that markets are efficient and that bonds are perfect substitutes. Consequently, a finding that the yield on domestic and foreign securities differs significantly from zero is subject to two interpretations. First, this result could indicate that assets are imperfect substitutes in an efficient market. Hence, intervention would work through the portfolio-balance mechanism. Second, and equally plausible, the finding could result if assets are perfect substitutes, but if markets are not perfectly efficient. This second finding suggests that intervention does not operate through a portfolio-balance channel.¹⁴

Loopesko (1983), Hutchison (1984) and Danker,

Haas, Henderson et al. (1985) offer three investigations of intervention within the portfolio-adjustment framework. None finds strong support for the existence of a portfolio-adjustment channel for intervention.

Even if the relevant bonds are imperfect substitutes, it appears that the response to small changes in the risk premium is quite low. Hutchison (1984) notes that changes in the cumulative total publicly held government debt is the relevant variable for the portfolio-adjustment model. Total government debt responds to intervention, to the surplus or deficit in the government budget, and to monetary policy. In his study of Japanese intervention, Hutchison (1984) suggests that intervention is usually too small, relative to the total volume of outstanding debt, to have a significant impact on portfolio choices. With the publicly held federal debt in excess of \$1.5 trillion, US intervention probably would need to be massive before the cumulative volume had significant impact on portfolio decisions.¹⁵

C. The Expectations Channel

Exchange-market intervention also could alter exchange rates if it changed expectations in the foreign-exchange markets. Most economists regard foreign-exchange markets as highly efficient. An efficient market is one that "fully reflects" all relevant, available information about today's events as well as about all predictable future events, including policy decisions (see Fama, [1970]).¹⁶ An implication of this is that exchange rates respond to unanticipated events or "news." When the exchange market and other markets are efficient, transactions based on observed exchange rates ensure the optimal allocation of resources.

While exchange markets are highly efficient, they probably are not perfectly efficient. Tests of market efficiency generally search for unusual profits from arbitrage or trading rules. In an efficient market, unusual profits should not exist; their existence would imply that certain transactors consistently have better information than others. Although these tests generally are

12 See Fukao (1985) for an interesting discussion of similar problems with coordinated intervention within the context of a portfolio-balance model.

13 For a survey, see Levich (1983). See also references to portfolio models in box 1.

14 This does not preclude the possibility that sterilized intervention could influence the exchange rate by improving market efficiency.

15 Batten and Ott (1984) make a similar argument, which does not result from a portfolio model, noting that the average daily volume of funds flowing through the exchange market is quite large relative to the typical volume of intervention.

16 Levich (1983) writes the spot rate, S_t , as:

$$S_t = Z_t - \beta[E(S_{t+1}) - S_t],$$
 where Z_t is a collection of contemporaneous variables that explain S_t . Collecting terms and substituting repeatedly for lagged values:

$$S_t = (1+\beta)^{-1} \sum_{k=1}^{\infty} (\beta/1-\beta)^k E(Z_{t-k}).$$

Hence, the spot exchange rate depends on current expectations of the relevant "fundamentals" in Z from the present to the indefinite future.

inconclusive, they have raised serious doubts about perfect exchange-market efficiency."

In addition, casual observations have raised questions about whether the market consistently uses all available information when setting exchange rates (see Dornbusch [1983]). Many exchange-market analysts contend that the exchange market often focuses on one piece of information to the exclusion of other important information and sometimes trades on false information or the wrong model. Trades on false information can be self-fulfilling. If, for example, traders believe that a full moon causes dollar depreciation and sell during full moons, their expectations will be met. Such activity can lead to abrupt, potentially disruptive adjustments in exchange rates as the market changes its focus to a different set, or eventually to the correct set, of fundamentals. Exchange-market analysts also have argued that exchange rates periodically are subject to speculative runs or bubbles. When information is incomplete, traders might rely on recent exchange-rate movements to indicate market sentiment and future movements in the rate. Traders may buy an appreciating currency or sell a depreciating currency, thereby reinforcing exchange rate movements. It is important to emphasize that most economists regard the inefficiencies in the exchange market as minor and as generally not contributing much to exchange-rate volatility. Nevertheless, to the extent that inefficiencies exist, intervention could alter exchange rates by altering expectations in the market.

Most monetary authorities attempt to conduct intervention policy in such a way as to improve the information flow through the market; according to the Jurgensen (1983) report:

The authorities in each of the Summit countries at times undertook large-scale intervention when they judged that market participants had not taken full account of fundamental factors, [or] had only reacted slowly to changes in fundamentals... (p.21).

There are a number of difficulties in implementing intervention designed to influence market expectations. Such intervention involves a judgment on the part of the monetary authorities that first, the current volatility in the market reflects inefficiencies and not adjustments (or expectations of adjustments) in fundamental determinants; and second, that the monetary authorities possess better information than the market about market developments. In the processing of normal information flow about real economic developments, prices, interest rates, or routine policy, there is little reason to suspect that

policymakers are any better informed than market participants. At times, however, the Federal Reserve and the U.S. Treasury could have better information than the market. This might occur, for example, when policymakers are considering a change in monetary or fiscal policy that differs from past policy reactions. The market already will incorporate a policy reaction function into the exchange-rate quotations. The need to provide new information to the market limits the instances when sterilized intervention is feasible.

A highly efficient market will interpret intervention activity quickly. Hakkio and Pearce (1985) found that unanticipated money-supply announcements had a significant effect on exchange rates, but that the adjustment usually occurred within twenty minutes of the announcement. One would expect the exchange-rate change in response to new information to be permanent.

The decision of the Group of Five countries to intervene in late September of 1985 (the Plaza decision) seems to represent a recent example of successful intervention that altered expectations in the foreign exchange markets. At the time, the dollar was depreciating in the foreign-exchange market, but the market seemed uncertain about the future course of monetary and fiscal policies. The money stock, narrowly defined, was growing in excess of its target range, suggesting that the Federal Reserve might take steps to reduce money growth. On the other hand, economic activity seemed weak at the time; many complained that the dollar was overvalued, and banks continued to experience difficulties with agricultural and international loans. These events suggested that the Federal Reserve might not tighten. At the same time, there was increasing talk in Congress about the need to reduce the federal budget deficit, but little concrete action. Under these circumstances, the market seemed to view the decision to intervene as a signal that U.S. policy would not move in a direction that might strengthen the dollar in exchange markets. The United States intervened forcefully, but did not continue to intervene beyond the quarter.

A second important question concerns the appropriateness of using intervention to alter expectations. Given that monetary authorities can provide new information to the exchange market about future monetary policy and alter expectations in the market, is intervention the appropriate vehicle for providing this information? Could the central bank provide the same information through the announcement of monetary policy intentions or by providing an interpretation of recent events? This issue has not received much attention in the literature on central-bank intervention. Perhaps actual currency purchases or sales are necessary to convince the market about cen-

tral bank intentions because it represents a bet by the central bank on its own information. Profitable intervention tends to stabilize the exchange rate. Moreover, as Henderson (1984) notes:

...losses on foreign exchange positions *can* lead to significant political problems for the authorities. Thus, if the authorities undertake an intervention policy which would generate foreign exchange losses if their pronouncements about future monetary policy were not put into effect, there might be more reason for private agents to take these pronouncements seriously. (p. 391)

We also should question the extent to which one truly can regard intervention that alters expectations about future monetary policy as being sterilized. While such intervention might intensify the effects of the change in monetary policy, as suggested in Jurgensen (1983, pp. 20-21), it is clearly dependent on fulfillment of the expectations.

While the expectations channel offers the most promise as a means of accomplishing sterilized intervention, it probably is the most difficult channel for a central bank to navigate. It is important to emphasize that the purchase or sale of foreign exchange *per se* is not affecting the exchange rate; the critical factor is the information these transactions might provide. Such intervention must be unanticipated and convey new, convincing information to the market. Because it is difficult to determine how expectations are forged and how strongly they are carried, attempts to alter expectations through intervention could be very expensive.

V. Conclusion

This article has discussed three channels through which central bank intervention could alter exchange rates. These are the monetary channel, the portfolio-balance channel, and the expectations channel. Two broad conclusions emerge from our review of these channels. First, changes in a nation's money growth relative to money growth abroad *can* have a profound effect on that nation's nominal exchange rates. This holds true whether the money stock change is engineered through conventional methods of monetary policy—open-market operations, discount-rate changes or reserve-ratio changes—or whether the money stock change is engineered through nonsterilized intervention in foreign exchange markets. Changes in a nation's monetary growth, however, may have only temporary effects on that nation's real exchange rates, especially if goods prices adjust slowly to changes in money growth rates.

However, nations have been most interested in conducting sterilized intervention, that is, intervention independent of monetary

policy. Such intervention would allow them the opportunity to influence exchange rates without interfering with domestic monetary objectives. Our second conclusion is that sterilized intervention has a limited, but not necessarily insignificant, impact on exchange rates. The portfolio-balance approach to exchange-rate determination suggests that sterilized intervention could influence exchange rates permanently by altering the relative supplies of government bonds in the hands of the public. If wealth holders perceive these bonds as net wealth and as imperfect substitutes, sterilized intervention could alter the exchange rate in the desired direction by changing the risk premium on these bonds. Unfortunately, empirical investigations to date have not demonstrated unequivocally that a risk premium exists on government bonds issued by the major developed countries. Nor have they shown that intervention in the magnitudes typically undertaken by the major central banks is sufficiently large to influence the risk premiums. The expectations channel suggests that sterilized intervention can influence exchange rates by altering the flow of information in the exchange market. However, this requires that the intervening central bank be able to identify periods of market inefficiency and that it have information, for example, about future monetary policy, which the market lacks. The exchange market seems highly efficient, so that opportunities for the central bank to exploit this channel probably are not great. Nevertheless, under the proper conditions, such intervention can have an immediate and permanent impact on exchange rates.

References

- Adams, Donald B. and Dale W. Henderson. "Definition and Measurement of Exchange Market Intervention," *Staff Studies No. 126*, Board of Governors of the Federal Reserve System, September 1983.
- Argy, Victor E. "Exchange Rate Management in Theory and Practice," *Princeton Studies in International Finance No. 50*, Department of Economics, International Finance Section, Princeton University, 1982.
- Artus, Jacques R. "Exchange Rate Stability and Managed Floating: The Experience of the Federal Republic of Germany," *International Monetary Fund Staff Papers*, Vol. 23, No. 2 (July 1976), pp. 312-33.

- Bagshaw, Michael and Owen Humpage. "Intervention, Exchange-Rate Volatility, and the Stable Paretian Distribution." *Working Paper No. 8608*, Federal Reserve Bank of Cleveland, July 1986.
- Barro, Robert J. "Are Government Bonds Net Wealth?" *Journal of Political Economy*, Vol. 82, No. 6 (November/December 1974), pp. 1095-1117.
- Batten, Dallas S. and Mack Ott. "What Can Central Banks Do About the Value of the Dollar?" *Review*, Federal Reserve Bank of St. Louis, May 1984, pp. 16-26.
- Bilson, John F. O. "The Monetary Approach to the Exchange Rate: Some Empirical Evidence," *International Monetary Fund Staff Papers*, Vol. 25, No. 1 (March 1978), pp. 48-75.
- Branson, William H. "Monetary Policy and the New View of International Capital Movements," *Brookings Paper on Economic Activity*, 2, 1970, pp. 235-62.
- Danker Deborah, Richard A. Haas, Dale W. Henderson, et al. "Small Empirical Models of Exchange Market Intervention: Applications to Germany, Japan, and Canada," *Staff Studies No. 135*, Board of Governors of the Federal Reserve System, April 1985.
- Dooley, Michael P. and Peter Isard. "Capital Controls, Political Risks, and Deviations from Interest-Rate Parity," *Journal of Political Economy*, Vol. 88, No. 2 (April 1980), pp. 370-84.
- Dornbusch, Rudiger, "Flexible Exchange Rates and Interdependence," *International Monetary Fund Staff Papers*, Vol. 30 No. 1 (March 1983), pp. 3-38.
- Dornbusch, Rudiger. "Expectations and Exchange Rate Dynamics," *Journal of Political Economy*, Vol. 84, No. 6 (December 1976), pp. 1161-76.
- Fama, Eugene F. "Efficient Capital Markets: A Review of Theory and Empirical Work," *The Journal of Finance*, Vol. 25, No. 2 (May 1970), pp. 383-417.
- Frankel, Jeffrey A. , "A Test of the Existence of the Risk Premium in the Foreign Exchange Market vs. the Hypothesis of Perfect Substitutability," *International Finance Discussion Papers No. 149*, Board of Governors of the Federal Reserve System, August 1979.
- ," "Tests of Monetary and Portfolio Balance Models of Exchange Rate Determination," in John F. O. Bilson and Richard C. Marston, eds., *Exchange Rate Theory and Practice*. Chicago: University of Chicago Press, 1984.
- Frenkel, Jacob A. "A Monetary Approach to the Exchange Rate: Doctrinal Aspects and Empirical Evidence," *Scandinavian Journal of Economics*, Vol. 78, No. 2 (1976), pp. 200-24.
- Fukao, Mitsuhiro. "The Effectiveness of Coordinated Intervention," in Takashi Hosomi and Mitsuhiro Fukao, *A Second Look at Foreign Exchange Market Intervention, JCIF Policy Study Series*, No. 3, April 1985.
- Genberg, Hans. "Effects of Central Bank Intervention in the Foreign Exchange Market," *International Monetary Fund Staff Papers*, Vol. 28, No. 3 (September 1981), pp. 451-76.
- Girton, Lance and Dale W. Henderson. "Central Bank Operations in Foreign and Domestic Assets under Fixed and Flexible Exchange Rates," in Peter B. Clark, et al., eds., *The Effects of Exchange Rates Adjustments*. Washington: U.S. Government Printing Office, 1977, pp. 151-79.
- Greene, Margaret L. "U.S. Experience with Exchange Market Intervention: January - March 1975" *Staff Studies No. 127*, Board of Governors of the Federal Reserve System, August 1984.
- ," U.S. Experience with Exchange Market Intervention: September 1977 - December 1979," *Staff Studies No. 128*, Board of Governors of the Federal Reserve System, October 1984b.
- ," "U.S. Experience with Exchange Market Intervention: October 1980 - September 1981," *Staff Studies No. 129*, Board of Governors of the Federal Reserve System, August 1984c.
- Hakio, Craig S. and Douglas K. Pearce. "The Reaction of Exchange Rates to Economic News," *Federal Reserve Bank of Kansas City Research Working Paper 85-01*, June 1985.
- Henderson, Dale W. "Exchange Market Intervention Operations: Their Role in Financial Policy and Their Effects." in John F. O. Bilson and Richard C. Marston, eds., *Exchange Rate Theory and Practice*, Chicago: University of Chicago Press, 1984.
- Humpage, Owen. "Dollar Intervention and the Deutschmark-Dollar Exchange Rate: A Daily Time-Series Model," *Working Paper, No.*

- 8404, Federal Reserve Bank of Cleveland September 1984.
- Hutchison, Michael M. "Intervention, Deficit Finance and Real Exchange Rates: The Case of Japan," *Economic Review*, Federal Reserve Bank of San Francisco, Winter 1984, pp. 27-44.
- International Monetary Fund. "Exchange Rate Volatility and World Trade: A Study by the Research Department of the International Monetary Fund," *Occasional Paper No. 8*, Washington: International Monetary Fund, July 1984.
- Jacobson, Lawrence R. "Calculations of Profitability for U.S. Dollar-Deutsche Mark Intervention" *Staff Studies No. 131*, Board of Governors of the Federal Reserve System, September 1983.
- Johnson, Harry G. "Toward A General Theory of the Balance of Payments," in R.E. Caves and H.G. Johnson, eds., *Reading in International Economics*, Vol. 11, Homewood, Illinois: Richard D. Irwin, 1968.
- Jurgensen, Phillippe (Chairman). *Report of the Working Group on Exchange Market Intervention*, processed, March 1983.
- Kouri, Pentti J.K. "Monetary Policy, the Balance of Payments and the Exchange Rate," in David Bigman and Teizo Taya, eds., *The Functioning of Floating Exchange Rates: Theory, Evidence and Policy Implications*. Cambridge, Massachusetts: Ballinger, 1980, pp. 79-111.
- Kouri, Pentti J. K. and Michael G. Porter. "International Capital Flows and Portfolio Equilibrium," *Journal of Political Economy*, Vol. 82, No. 3 (May -June 1974), pp. 443-67.
- Levich, Richard M. "Empirical Studies of Exchange Rates: Price Behavior, Rate Determination and Market Efficiency," *National Bureau of Economic Research Working Paper Series*, No. 1112, April 1983.
- Loopesko, Bonnie E. "Relationships among Exchange Rates, Intervention, and Interest Rates: An Empirical Investigation," *Staff Studies No. 133*, Board of Governors of the Federal Reserve System, November 1983.
- Mayer, Helmut and Hiroo Taguchi. "Official Intervention in the Exchange Markets: Stabilizing or Destabilizing?" *BIS Economic Papers No. 6*, Bank for International Settlements, Monetary and Economic Departments, March 1983.
- McKinnon, Ronald I. "Currency Substitution and Instability in the World Dollar Standard," *American Economic Review*, Vol. 72 No. 3 (June 1982), pp. 320-33.
- Pippinger, John E. and Llad Phillips. "Stabilization of the Canadian Dollar: 1952-1960," *Econometrica*, Vol. 41, No. 5 (September 1973), pp. 797-815.
- Rogoff, Kenneth. "On the Effects of Sterilized Intervention: An Analysis of Weekly Data." *Journal of Monetary Economics*. Volume 14, No. 2, September 1984, pp. 133-50.
- Shafer, Jeffrey R. and Bonnie E. Loopesko. "Floating Exchange Rates after Ten Years," *Brookings Papers on Economic Activity*, 1, 1983, pp. 1-71.
- Sweeney, Richard J. "Leaning Against the Wind: The Case of Canadian Exchange Intervention, 1952-1960," *Claremont Working Papers*, 1981.
- Taylor, Dean. "Official Intervention in the Foreign Exchange Market, or, Bet against the Central Bank," *Journal of Political Economy*, Vol. 90, No. 2 (April 1982a), pp. 356-68.
- Taylor, Dean. "The Mismanaged Float: Official Intervention by the Industrialized Countries," in Michael B. Connolly, ed., *The International Monetary System: Choices for the Future*. New York: Praeger Publishers, 1982b, pp. 49-84.
- Tobin, James. "A General Equilibrium Approach to Monetary Theory," *Journal of Money, Credit and Banking*, Vol. 1, No. 1 (February 1969), pp. 15-29.
- _____. "Liquidity Preference as Behavior Towards Risk," *Review of Economic Studies*, Vol. 25, No. 67 (February 1958), pp. 65-86.
- Tryon, Ralph W. "Small Empirical Models of Exchange Market Intervention: A Review of the Literature," *Staff Studies No. 134*, Board of Governors of the Federal Reserve System, September 1983.
- Tsiang, S. C. "The Theory of Forward Exchange and Effects of Government Intervention on the Forward Exchange Market," *International Monetary Fund Staff Papers*, Vol. 7, No. 1 (April 1959), pp. 75-106.
- Wilson, John F. "Comments on Dean Taylor's Paper: 'The Mismanaged Float: Official Intervention by the Industrial Countries,'" in Michael B. Connolly, ed., *The International Monetary System: Choices for The Future*. New York: Praeger Publishing, 1982, pp. 297-306.

Comparing Inflation Expectations of Households and Economists: Is a Little Knowledge a Dangerous Thing?

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The authors gratefully acknowledge the research assistance of Michael Pakko, and helpful comments from James G. Hoehn, Owen F. Humpage, and Donald Mullineaux.

Many economic decisions depend on the inflation expectations of market participants. For example, households consider future inflation when making intertemporal decisions about consumption, savings, and leisure, and investors allow for potential inflation when estimating the real returns on investments.

For a number of reasons, empirical researchers are paying increasing attention to survey measures of inflation expectations. While reduced-form forecasts are readily available as proxies for inflation expectations, their use generally assumes a long period of policy and structural stability. In the presence of policy and other structural shifts in the economy, direct measures of expectations may adapt to changing conditions faster than model-based ones.

Survey measures of inflation expectations are important to research economists because they provide data on an otherwise unobservable variable. Wallis (1980) and Pesaran (1981) derived the conditions required to identify behavioral parameters in simultaneous rational expectation models. They showed that the assumptions needed to identify behavioral parameters in rational expectation models are arbitrary; these assumptions generally are not implied by economic theory and cannot be tested. Kaufman and Woglom (1983) have suggested using observable survey-based measures of expectations to estimate otherwise unidentifiable, policy-invariant parameters in rational expectation models.

Measures of inflation expectations are important to the Federal Reserve because it has the responsibility for managing the money supply in a way that fosters price stability. Expectations of inflation can influence the linkage between money, interest rates, and prices. Inflation expectations have become especially important in recent years due to the Federal Reserve's disinflationary strategy.

In this paper, we examine the inflation forecasts from two surveys: one taken from households, and the other taken from professional economists.¹ While the state of the art in economic forecasting is still primitive, economists would probably like to believe that they are able to make better inflation forecasts than laymen. In order to determine whether this is so, we compare these two survey forecasts to each other and to a time-series forecast. Pearce (1979) showed that, for the period from 1959 to 1976, a simple univariate ARIMA model produced more accurate out-of-sample inflation forecasts than did a survey of professional economists. We have included a similar model to test whether the Pearce results are valid for recent years and to see how the time series model fares against the

¹ Gramlich (1983) presents statistics suggesting that both the economist and the household survey measures of inflation expectations are biased and inefficient. Bryan and Gavin (1986) show that his main results are derived from a mis-specified model. When the specification error is corrected, the Michigan survey of household inflation expectations passes the standard tests for unbiasedness. However, there remains doubt about the properties of the inflation expectation series derived from the Livingston survey of professional economists.

households' inflation forecast. Embarrassingly enough, our results suggest that the knowledge which economists bring to the forecasting exercise may have made their inflation forecasts less accurate than both the more naive forecast of households and the forecasts generated from a simple, atheoretical, time-series model.

I. Conditional Efficiency of the Survey Forecasts

This section presents results comparing the forecasts of inflation? The household survey of inflation, compiled by the University of Michigan's Survey of Consumer Finances, records 12-month consumer price forecasts for approximately 1,000 randomly selected households. The economists' survey measure is constructed by Joseph Livingston of the *Philadelphia Inquirer*, where year-ahead inflation forecasts of approximately 50 economists are summarized semi-annually.³

A simple procedure for evaluating the relative efficiency of competing forecasts is discussed by Granger and Newbold (1977). Since it is only in special cases that we know the minimum attainable forecast variance, they suggest using a criterion of "conditional efficiency" to evaluate forecast accuracy. A forecast is said to be conditionally efficient with respect to another if the variance of that forecast's error is not significantly greater than the variance of the forecast error from a combined forecast. In the case of multiple, linearly independent forecasts ($P_1^e, P_2^e, \dots, P_n^e$), the "conditionally efficient" forecast, say P_1^e , is defined such that in the ordinary least squares (OLS) regression:

$$(1) \quad P_t = \alpha + \beta_1 \text{ }_{t-1}P_{1t}^e + \beta_2 \text{ }_{t-1}P_{2t}^e + \dots + \beta_n \text{ }_{t-1}P_{nt}^e + u_t;$$

where $E(u_t) = 0$ and $E(u_t u_t') = \sigma_u^2 I$, then, $\alpha = 0$, $\beta_1 = 1$, and $\beta_i = 0$ for $i > 1$.

Specifically, we estimated the following equation over the 1949-84 period:

$$(2) \quad P_t = \alpha + \beta_1 \text{ }_{t-1}P_{1t}^e + \beta_2 \text{ }_{t-1}P_{2t}^e + u_t$$

where: $\text{ }_{t-1}P_{1t}^e$ = the forecast of inflation for year t from the Livingston Survey made in year $t-1$, and

$\text{ }_{t-1}P_{2t}^e$ = the forecast of inflation for year t from the Michigan Survey made in year $t-1$.

The results of this estimation are reproduced at the top of table 1. F-tests were conducted on the joint hypothesis that $\alpha=0$, $\beta_1=1$, and $\beta_{n \neq i}=0$ for $i=1, 2$. The University of Michigan survey of households was found to be conditionally efficient for both the June and the December inflation forecasts (that is, the hypothesis $\beta_2=1$ and $\beta_1=0$ could not be rejected at the 5 percent level of confidence). This means that the year-ahead forecast of inflation for the survey of households could not be significantly improved using additional information from the Livingston survey of economists. However, the economists' survey could have been improved given information contained in the household forecast. That is, the hypothesis that $\beta_1=1$ and $\beta_2=0$ could be rejected at the 5 percent level of confidence ($F = 9.17$ for the June inflation forecasts and 4.35 for the December inflation forecasts).

Because the Michigan survey results are derived from qualitative survey data before 1966, it is not clear what influence knowledge of past experience may have had on developing the procedures used to generate the numerical data and, consequently, on the survey's *ex post* accuracy. We separated the sample at 1966 to examine the period for which the Michigan survey data included only quantitative estimates of inflation.

We also included the one year-ahead univariate time-series forecast of inflation ($\text{ }_{t-1}P_{3t}^e$) in the conditional efficiency tests for the post-1966 period to compare the performance of the two surveys against a relatively simple, atheoretical model of inflation.⁴

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2 Other surveys not examined in this paper include the NBER-ASA quarterly survey of inflation expectations a 3 the Money Market Services monthly survey of inflation expectations. Both represent surveys of economists. Victor Zamowitz examines the NBER-ASA in a number of papers. See Zamowitz (1984) for a recent paper and references to earlier work. Pearce (1985) provides an analysis of the Money Market Services survey of inflation expectations.

3 The form of the Michigan survey has changed substantially over the years. For example, prior to 1966, panel participants were merely asked for qualitative responses. Between the second quarter of 1966 and the second quarter of 1977 respondents had categories of price increases suggested to them, and those who expected prices to fall were not asked to quantify their response. Only since the third quarter of 1977 did Michigan survey panelists actually forecast the rate of inflation. See Juster and Comment (1980) for a description of the procedures used to derive the household inflation expectations from the Michigan survey data; a summary of this paper is published as an appendix in Noble and Fields (1982). Livingston Survey responses are compiled by the research staff of the Federal Reserve Bank of Philadelphia. The mean expected inflation rate derived from the Livingston survey uses the methodology proposed by Carlson (1977).

.....
4 The time-series model was not included in the full-sample tests for conditional efficiency because the early observations were needed to generate the out-of-sample forecasts.

The time-series forecast is similar to the one used by Pearce (1979). Specifically, the model used to generate the time-series forecasts is:

$$(3) \quad P_t^m = P_{t-1}^m - \theta a_{t-1} + a_t; \quad E(a_t) = 0, \\ E(a_t a_t') = \sigma_a^2 I.$$

where P^m is the monthly inflation rate (approximated by the first difference in logarithms of the Consumer Price Index) and a is the error. Notice that the n -step-ahead forecast of a first-order moving average model is equal to the one-step-ahead forecast. Three F tests were conducted on the separate hypotheses that each of the forecasts was "conditionally efficient," as defined in (1). The

model were conditionally efficient, relative to the survey of economists.

II. An Analysis of Survey Forecast Errors

In table 2, we show the mean absolute error (MAE), the root mean square error (RMSE) and the Theil decomposition of the forecast error for the two survey measures of inflation expectations.⁵ The Theil decomposition evaluates the portion of the error due to bias (U^M), the portion due to the difference of the regression coefficient from unity (U^R), and the portion due to residual variation (U^D). In an optimal forecast, we expect to find U^M and U^R approximately equal to zero and U^D close to one.

Conditional Efficiency of Alternative Forecasts

Entire Sample

1949-1985

| | | | | | | |
|----------------|----------|-----------|-----------|-------|------|------|
| June forecasts | α | β_1 | β_2 | R^2 | DW | SEE |
| | 0.71 | 0.12 | 0.89 | 0.69 | 1.57 | 2.10 |
| t-statistics | (1.27) | (0.46) | (3.27) | | | |
| F-statistics | | 9.17** | 1.19 | | | |

1949-1984

| | | | | | | |
|--------------------|--------|--------|--------|------|------|------|
| December forecasts | | | | | | |
| | 1.13 | 0.69 | 0.28 | 0.67 | 1.25 | 2.15 |
| t-statistics | (1.90) | (1.98) | (0.81) | | | |
| F-statistics | | 4.35* | 2.02 | | | |

Post-1965 Years

1965-1985

| | | | | | | | |
|----------------|----------|-----------|-----------|-----------|-------|------|------|
| June forecasts | α | β_1 | β_2 | β_3 | R^2 | DW | SEE |
| | 0.157 | -0.196 | 0.792 | 0.433 | 0.73 | 1.63 | 1.81 |
| t-statistics | (0.12) | (-0.54) | (1.97) | (1.23) | | | |
| F-statistics | | 6.41** | 1.11 | 1.87 | | | |

1966-1984

| | | | | | | | |
|--------------------|--------|--------|---------|--------|------|------|------|
| December forecasts | | | | | | | |
| | 2.743 | 0.142 | -0.690 | 1.167 | 0.59 | 1.18 | 2.28 |
| t-statistics | (1.74) | (0.28) | (-1.02) | (2.55) | | | |
| F-statistics | | 3.57* | 2.09 | 0.79 | | | |

NOTES: t-ratios for α and β around 0 are in parentheses.

F-statistics are calculated for each β_i under the joint hypothesis that $\alpha = 0$, $\beta_i = 1$, and $\beta_{n \neq i} = 0$ for $i = 1$ to 3, respectively.

** = significant at 1 percent.

* = significant at 5 percent.

TABLE 1

results of these tests are presented at the bottom of table 1.

For both the June and December inflation forecasts, only the survey of professional economists could have been improved given information from the other forecasts. Hence, we could not reject the hypothesis that the household survey and the atheoretical time-series

Over the full period, the Michigan survey has the lowest mean absolute error and the highest value for U^D , while the Livingston forecast does relatively poorly. Only about 70 percent of the Livingston forecast error was residual

variation. That is, about 30 percent of the economists' inflation error appears to be nonrandom.

In the post-1966 period, which includes the simple time-series model, the time-series model has the lowest mean absolute error, the lowest mean square error, and the lowest residual bias. The Michigan survey of households has the highest portion of the forecast error attributed to residual variation (96 percent). The Livingston survey of professional forecasts is the least accurate inflation guess of the three, and the errors in this survey have a proportionately large nonrandom component.

was 2.335 percent in the post-1966 period, and that the difference between the Michigan and Livingston forecast errors was only 0.5 percent.

Anecdotal evidence for this argument is provided by the generally thin trading in the CPI futures market. Since June 21, 1985, the Coffee, Sugar, and Cocoa Exchange in New York City has made a market in CPI futures contracts. If there were a significant amount of risk uniquely associated with uncertainty about movements in consumer prices (apart from uncertainty about the behavior of interest rates which have very active futures markets), then we would expect

Alternative Forecast Accuracy

| Time Period | Model | MAE | RMSE | U ^M | U ^R | U ^D |
|--|-------------|-------|-------|----------------|----------------|----------------|
| June 1949 -June 1984 $\mu_p = 4.37$ $s_p = 3.56$ | Livingston | 1.902 | 2.715 | 0.240 | 0.022 | 0.738 |
| | Michigan | 1.607 | 2.264 | 0.074 | 0.010 | 0.916 |
| | Time-series | 1.870 | 2.335 | 0.018 | 0.107 | 0.876 |
| June 1966 -June 1984 $\mu_p = 6.64$ $s_p = 3.22$ | Livingston | 2.257 | 2.900 | 0.194 | 0.013 | 0.794 |
| | Michigan | 1.904 | 2.377 | 0.043 | 0.000 | 0.957 |
| | Time-series | 1.870 | 2.335 | 0.018 | 0.107 | 0.876 |

NOTE: μ_p is the average actual inflation rate, s_p is the standard deviation of actual inflation. The time-series forecasts are in-sample forecasts for the period 1949 through 1965. After 1965, the forecasts are 12 months ahead. The model was re-estimated every six months. The first-order MA parameter ranged from a high of 0.729 in 1973 to a low of 0.684 in 1983.

TABLE 2

III. Is a Little Knowledge a Dangerous Thing?

Why is the Michigan survey of households a more accurate and less "biased" inflation forecast than the Livingston survey? We suggest several possibilities. One may be that the large sample of households is relatively more representative of the participants in the market for the basket of goods covered by the Consumer Price Index. No individual actually buys the representative basket of goods; the basket will vary with demographics and income class. It may be that any small, homogeneous group of consumers would misforecast the inflation rate as badly as do economists. It seems likely that the 50 or so economists in the Livingston survey are as homogenous a group as one might put together from a subset of the Michigan sample. Furthermore, they are highly unlikely to be a representative sample, since they are almost all male and well-paid in comparison to the average consumer.

Another reason for the Livingston economists' relatively poor forecasts may simply be that they have little incentive to do better. The average size of the error from the best forecast is large relative to the difference between the alternative forecast errors. In *table 2* we saw that the root mean square error of the time-series forecast

active trading in this financial vehicle. However, such active trading has not occurred.

Empirical support for this incentive argument is given by Hafer and Resler (1982), who identified each of the Livingston respondents with one of six professional affiliations. Hafer and Resler argued that only economists employed by nonfinancial businesses had direct and strong incentives to produce accurate inflation forecasts. They show that this group produced better forecasts than did economists from academia, commercial banks, investment banks, the Federal Reserve System, and others. This argument is based on the notion that economists with more incentive to produce a better forecast will spend more resources gathering better information.

This line of reasoning is consistent with the supposition that the mean of the Michigan survey would be a better forecast than any individual economist's forecast. The survey of 1,000 households combines information about inflation in a way that would be very expensive for an individual economist to replicate.

Furthermore, there is a high degree of communication among economists about their forecasts, so that the already small number of respondents in the Livingston survey

may not represent much independent information. This is in strong contrast with the survey in which Michigan respondents are asked to forecast the rate of inflation in the things they buy. This latter survey was designed by specialists to get independent information from a representative sample of consumers. Our results may simply reflect the superior design of the Michigan survey.

Another potential reason for the inferiority of the economists' forecasts is that they may have been relying on econometric models to forecast inflation. Econometric models used during this period typically estimated inflation as an adaptive process, that is, as a weighted average of past inflation rates. Figlewski and Wachtel (1981) show that the poor forecasts in the Livingston survey appear to have been formed in this way. Vanderhoff (1984) presents further evidence that economists' forecasts went astray in much the same way as did econometric forecasts that were based on linear models assumed to have constant parameters.

The naive forecasts of households and the ARIMA model appear to have captured the essentially nonstationary aspects of the process generating inflation in a way that economists using econometric models did not. We note that there has been a growing tendency for economists to incorporate time-series methods in their econometric models; in particular, economists have been more conscious of the possibility that the variables they study may be generated by nonstationary processes.

IV. Conclusion

We may draw several conclusions from this study. First, none of the forecasts perform well in an absolute sense. The differences among the forecasts are small relative to the size of the mean error of even the best forecast.

Second, we would clearly choose the Michigan survey over the Livingston survey of economists on the basis of historical accuracy. The mean forecast from the Livingston survey has been shown to perform relatively poorly; it does worse than a simple time-series model and worse than a forecast derived from a survey of households. However, the Livingston survey may be useful if one accepts the notion that it is an accurate historical representation of economists' beliefs. For instance, since policymakers rely on economists' forecasts, the Livingston survey may help us understand policymakers' past errors.

Finally, the relatively simple time-series model has performed about as well as the Michigan survey. Thus, for those who seek timely forecasts of the CPI, we recommend this ARIMA model. For those researchers who need an observable measure of expectations, the Michigan

survey is more likely to represent the expectations of rational, maximizing agents, than is the extensively-used Livingston survey of economists.

References

- Bryan, Michael F. and William T. Gavin. "Models of Inflation Expectations Formation: A Comparison of Household and Economist Forecasts. A Comment," *Journal of Money, Credit and Banking*, (Forthcoming, November 1986).
- Carlson, John A. "A Study of Price Forecasts," *Annals of Economic and Social Measurement*, vol. 6, no. 1 (Winter 1977), pp. 27-56.
- Figlewski, Stephen and Paul Wachtel. "The Formation of Inflationary Expectations," *The Review of Economics and Statistics*, vol. 63, no. 1 (February 1981), pp. 1-10.
- Granger, Clive W.J., and Paul Newbold. *Forecasting Economic Time Series*. New York: Academic Press, Inc., 1977.
- Gramlich, Edward M. "Models of Inflation Expectations Formation: A Comparison of Household and Economist Forecasts," *Journal of Money, Credit and Banking*, vol. 15, no. 2 (May 1983), pp. 155-73.
- Hafer, R.W., and David H. Resler. "On the Rationality of Inflation Forecasts: A New Look at the Livingston Data," *Southern Economic Journal*, vol. 48, no. 4 (April 1982), pp. 1049-56.
- Kaufman, Roger T., and Geoffrey Woglom. "Estimating Models with Rational Expectations," *Journal of Money, Credit and Banking*, vol. 15, no. 3 (August 1983), pp. 275-85.
- Juster, F. Thomas, and Robert Comment. "A Note on the Measurement of Price Expectations," *Institute for Social Research Working Paper*, The University of Michigan, 1980.
- Noble, Nicholas R., and T. Windsor Fields. "Testing the Rationality of Inflation Expectations Derived from Survey Data: A Structure-Based Approach," *Southern Economic Journal*, vol. 49, no. 2 (October 1982), pp. 361-73.
- Pearce, Douglas K. "Short-run Inflation Expectations: Evidence from a Monthly Survey," *Research Working Paper 85-03*, Federal Reserve Bank of Kansas City, 1985.
- "Comparing Survey and Rational Measures of Expected Inflation," *Journal of Money, Credit and Banking*, vol. 11, no. 4 (November 1979), pp. 447-56.
- Pesaran, M.H. "Identification of Rational Expectations Models," *Journal of Econometrics*, vol. 16, no. 3 (August 1981), pp. 375-98.
- Theil, Henri. *Applied Economic Forecasting*. Amsterdam: North Holland, 1966.
- Vanderhoff, James. "A 'Rational' Explanation for 'Irrational' Forecasts of Inflation," *Journal of Monetary Economics*, vol. 13, no. 3 (May 1984), pp. 387-92.
- Wallis, Kenneth F. "Econometric Implications of the Rational Expectations Hypothesis," *Econometrica*, vol. 48, no. 1 (January 1980), pp. 49-73.
- Zarnowitz, Victor. "The Accuracy of Individual and Group Forecasts from Business Outlook Surveys," *Journal of Forecasting* vol. 3, no. 1 (January/March 1984), pp. 11-26.

Aggressive Uses of Chapter 11 of the Federal Bankruptcy Code

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Introduction

The filing of a voluntary bankruptcy petition under Chapter 11 of the Bankruptcy Code of 1978 by the LTV Corporation on July 17, 1986 focused renewed attention on the recent evolution of corporate reorganizations under the Bankruptcy Code. This article reviews that evolution and offers alternative explanations for the kinds of uses noted in recent Chapter 11 petitions. To some observers, a Chapter 11 petition is becoming one of the standard financial strategies of large corporations. In a period of disinflation, the filing of a Chapter 11 petition is not a completely unexpected or unnatural response to the need to reduce corporate obligations.

Alternative legal mechanisms do exist for the orderly downsizing of corporate assets and liabilities in the face of a generally falling price level or a significantly reduced demand in specific markets. Those alternatives include assignments for the benefit of creditors, corporate liquidations, and corporate dissolutions and reorganizations under state law, as well as contractual agreements for nonbankruptcy lending ("work-outs"). However, those alternatives often are unsatisfactory because they do not provide a convenient method for debtors to stay all creditors' claims automatically or to reject burdensome contingent liabilities. Thus, corporate reorganization under Chapter 11 typically is the debtor's preferred alternative. Creditors also may prefer the orderly process of negotiation with a debtor through creditors' committees under the supervision of a federal bankruptcy court, instead of attempts to reorganize the debtor without the

court's protection and assistance.

A more restrained, and probably more accurate, view of bankruptcy petitions such as that filed by LTV is that a Chapter 11 filing may be helpful in restructuring large claims of secured creditors and of creditors with the priority claims described in section 507 of the Bankruptcy Code (11 U.S.C. section 507). Nevertheless, the use of Chapter 11 filings as a sword rather than a shield was not traditionally contemplated under the 1978 Bankruptcy Code or the prior United States bankruptcy acts.

I. An Economic Perspective

Basic economics textbooks pay little, if any, attention to bankruptcy proceedings as a mechanism for allocating resources. When an uncompetitive firm becomes insolvent, economics texts generally assume that its assets will be liquidated to satisfy creditors and that the firm no longer will exist. Economists call this process "exit from the market." Shareholders may suffer large losses, including the complete loss of their investments. At times, new investors purchase some of the liquidated assets on favorable terms, putting up fresh capital, and a new firm "enters the market." Some former assets are scrapped, some former employees are not re-employed, and some former creditors are not paid fully. The new firm generally has a better chance of succeeding than the old firm because it has some combination of lower costs, greater productivity, and better management. Economists describe this market-driven process as being efficient because investors purchase

assets or new stock in the firm at market prices. Those investors could have used their capital for other purposes.

In practice, corporate reorganizations under the Bankruptcy Code allocate resources in a manner that may differ significantly from an economist's description of corporate reorganizations. Under Chapter 11, troubled firms essentially bargain with creditors' committees and, occasionally, with their own employees regarding the conditions under which they can remain "going concerns." Negotiations with employees typically would cover the restructuring of executives' compensation contracts and unions' collective bargaining agreements.

The bankruptcy judge acts as a mediator/arbitrator, following the Bankruptcy Rules. However, the real power to affect the day-to-day operations of a debtor is in the hands of the creditors' committees. Usually, management of the bankrupt firm attempts to remain in control of the ongoing operations of the enterprise. In such cases, management is referred to as the "debtor in possession." Often, as was the case with the LTV filing, bank creditors already have a functioning committee that has been negotiating with management before a bankruptcy petition is filed. Thus, it is not at all inaccurate to describe the bankruptcy judge as a detached mediator or referee. Usually, the judge plays only a small role in preparing a reorganization plan. That plan ordinarily is drafted by the debtor and must be ratified by the creditors' committees. The committees may serve as active, involved co-managers of the bankrupt firm, and it is not unusual for counsel for the creditors' committees to meet at least weekly with management.

If no agreement between the bankrupt firm and its creditors can be reached voluntarily, the court, usually acting through a trustee, can impose a solution. One possible solution is a complete liquidation of the firm, but such a solution is used in Chapter 11 cases only after a judge determines that no viable alternative exists. It would be mere coincidence if a firm reorganized in a Chapter 11 proceeding had the same assets, liabilities, capitalization, labor force, wage rates, and productivity as a market-organized firm. Indeed, a Chapter 11 proceeding may support, at least temporarily, the continued existence of a firm that otherwise would have been liquidated.

Corporate reorganization arguably is always a smoother process for all concerned rather than a straight liquidation under Chapter 7 of the Bankruptcy Code. That is why the threat of filing a Chapter 7 petition serves management as a strong bargaining tactic in dealing with creditors' committees. Regardless of the outcome of a Chapter 11 proceeding, all parties theoretically have a sense of participation and partial control

in a corporate reorganization. If reorganization produces a new firm that proves to be uncompetitive, and if further restructuring is required, at least the affected parties will have time to adjust to the changed circumstances.

Yet, to the extent that a Chapter 11 petition thwarts the discipline of the marketplace, the ultimate costs of corporate reorganization to society may be greater than those of corporate liquidation. This can occur because the court's judgment as to the viability of the reorganized firm and any arrangement reflecting the vested interests of the creditors may be wrong. On the other hand, lawyers seem to believe that creditors' lawyers, bankruptcy judges, and trustees usually assess the possibilities of corporate reorganizations accurately because of their repeated experiences with working out the consequences of Chapter 11 petitions. Also, the continued presence of corporate management in debtor-in-possession arrangements under most Chapter 11 plans guarantees that the role of business judgment will be significant. Thus, in the end, the normal result of a corporate reorganization traditionally has not been completely at odds with the overall lessons of human experience.

II. Priorities Among Creditors

Section 507 of the Bankruptcy Code prescribes a schedule of the priorities of distribution for claims of classes of creditors in a bankruptcy proceeding. A simplified listing of the priorities under Section 507 is as follows:

- Administrative expenses of the bankrupt's estate.
- Postpetition unsecured claims arising prior to the appointment of a bankruptcy trustee.
- Up to \$2,000 per claimant for unsecured claims for accrued but unpaid wages, salaries, commissions, vacation, and sick leave pay.
- After deducting the \$2,000 per employee above, unsecured claims for up to \$2,000 per claimant for contributions to employee benefits.
- Unsecured claims of farmers against grain elevators or of fishermen against fish processing plants.
- Up to \$900 per unsecured claimant for security deposits and down payments for services not rendered or goods not provided.
- Unsecured claims of governmental units for taxes, customs duties, and penalties accrued but unpaid.

Claims for employees' wages and benefits have third and fourth priority in the schedule. General, unsecured, unsubordinated

claims, including the balance of claims for wages and benefits, are given no priority and, thus, effectively have eighth priority — behind all other classes of prior claims.

Secured claims are *not* subject to the schedule of priorities, but bankruptcy trustees may restrain secured creditors from realizing upon their liens in return for providing "adequate protection" to the secured creditors while their claims are stayed. Unfortunately, one man's "adequate protection" may be another man's outrageous infringement of rights. In practice, secured creditors often are forced to renew their extensions of credit to bankrupt enterprises in order to allow those enterprises to continue operating for the benefit of all creditors, both secured and unsecured.

Holders of investment securities have no priority of claim and generally are paid, if at all, only after all prior classes of creditors are paid in full. A normal ranking of security holders is as follows:

- Subordinated debt holders, including bond and note holders.
- Preferred shareholders.
- Common equity shareholders.

Holders of investment securities are referred to the terms of the relevant legal documents to determine the relative priority of different types of investment securities within the classes of investment security holders.

III. Evolution of **the** Bankruptcy Code

The power to establish uniform laws on bankruptcies was given to Congress under Article I, section 8, clause 4, of the United States Constitution. Bankruptcy was bound up with controversies regarding debtors' prison under the common law and, for the first century of its existence, the United States had no permanent bankruptcy law.¹ Congress managed to keep bankruptcy laws on the books only briefly, during the years 1800-1803, 1841-1843, and 1867-1878. Disputes regarding the availability and liberality of discharges from debts in bankruptcy proceedings created the political pressures that caused the repeal of those early bankruptcy acts. Generally, Jeffersonians, Jacksonians, and Southern and Western Democrats favored liberal bankruptcy laws as a means of discharging prior debts and granting debtors fresh starts in life. Naturally, Tories, High Federalists, Whigs, and Republicans (that is, the creditor class) opposed the liberal discharges available to nonmerchant debtors under bankruptcy laws.² In

the aftermath of the depression following the Panic of 1893, the first permanent bankruptcy law was passed in 1898. That legislation provided principally for straight liquidations. Then, in fits and starts between 1932 and 1938, in the throes of resolving the problems of a time when "so many were debtors, and so few were solvent," the forerunners of the reorganization provisions of the present Bankruptcy Code were enacted in 1938. Provisions for corporate reorganizations (Chapter 10) and corporate arrangements (Chapter 11) appeared for the first time as part of the Chandler Amendments of 1938. Still, bankruptcy was a defensive measure for corporate debtors, and the requirement of corporate good faith in filing bankruptcy petitions, not difficult to establish during the Great Depression, routinely was enforced by the courts.

The present Bankruptcy Code was enacted in 1978. Chapters 10 and 11 of the 1938 bankruptcy act were combined in the new Chapter 11. Under the new Chapter 11, the stay of creditors' claims became automatic upon the filing of the petition. The automatic stay was seen as a procedural improvement from the debtors' perspective because, previously, the stay had to be requested separately, and creditors could resist the application for a stay, even after the Chapter 11 petition was filed. Also, the requirement of actual insolvency at the time of filing under the 1938 act was eliminated in the new Chapter 11.

The Bankruptcy Code was amended in 1984, following a June 1982 United States Supreme Court decision striking down crucial parts of the 1978 Code.³ The 1984 amendments primarily were procedural, covering the jurisdiction and tenure of bankruptcy judges. However, the 1984 amendments also restricted the extent of discharges in consumer bankruptcies, established standards for judging the reasonableness of employers' rejections of collective bargaining agreements, reordered the priority of distributions of stored grain to farmers, and exempted certain repurchase agreements covering financial instruments from the automatic stay provisions of the Code.

¹ A good overview of the comparative histories of the evolution of bankruptcy acts in the United States and the United Kingdom is Vern Countryman. *A History of American Bankruptcy Law*, 81 *Commercial Law Journal* 226 (1976), from which much of the historical information in this commentary is taken.

² See Countryman (id.) at 229-230. Of course Jeffersonians objected when the first bankruptcy act (1800) made discharges available only to merchants. On the other hand, Hamiltonians found the act useful. Robert Morris, once the financier of the American Revolution, and by then "the most daring real estate plunger in the United States," financed speculative housing development in the District of Columbia, beginning in 1796. Unfortunately, in 1797, a financial panic arose from the outbreak of the wars between England and revolutionary France. Morris was ruined and spent more than three years in the Philadelphia debtors' prison. His discharge in 1801 under the 1800 bankruptcy act probably was the most famous bankruptcy discharge in the nineteenth century. See John C. Miller, *The Federalist Era: 1780-1801*, 252 (1960).

³ *Northern Pipeline Construction Co. v. Marathon Pipe Line Co.*, 458 U.S. 50 (1982).

Throughout the evolution of the present Bankruptcy Code, the statutes enacted have been reasonably clear expressions of the Congressional view that bankruptcy should be a defensive, nonroutine measure and should not be used to advance the financial interests of corporate debtors beyond the point that would have been achieved by competition in a free market among solvent corporations.

IV. Aggressive Uses of Bankruptcy

A potentially disturbing trend of filings under the Bankruptcy Code began with the classic "surprise filing" by the *Johns-Manville Corporation* in 1982. Johns-Manville, facing an unpredictable amount of claims for damage thought to be caused by asbestos, proposed a Chapter 11 reorganization under which all present and future asbestos claimants would be reimbursed from a separate fund created by Johns-Manville. Meanwhile, the normal business operations of the corporation continued, comparatively unimpeded by the claims of asbestos victims. The victims' fund is to receive up to \$2.5 billion over 25 years, including the contribution of at least 50 percent of the common voting equity shares of the corporation. The *Johns-Manville* case has been questioned in some of the bankruptcy literature as lacking the elements of a good-faith filing, but at this writing it appears that the settlement will stand?

Other potentially disturbing bankruptcy decisions soon followed in the wake of the *Johns-Manville* case. In February 1984, the United States Supreme Court decided, 5-4, in *National Labor Relations Board v. Bildisco & Bildkco, Inc.*, that employers undergoing Chapter 11 reorganizations unilaterally may abrogate or modify collective bargaining agreements that are seriously burdensome to the employer when, on balance, the equities of the case favor modification of burdensome terms.⁵

The *Bildisco* case illustrates the way that bankruptcy courts usually resolve fundamental conflicts between provisions of the Bankruptcy Code and other provisions of federal law: Bankruptcy provisions prevail. It is only natural for bankruptcy courts to consider the creation of viably reorganized entities as their paramount duty in Chapter 11 cases. The remedy for those distressed by such tendencies on the part of the bankruptcy courts is to petition Congress for amendments to the Bankruptcy Code that would specifically address such conflicts. However, as is noted below, the bankruptcy courts have modified somewhat their tendency to elevate bankruptcy procedures above other considerations of federal or state law only in environmental pollution cases.

Labor leaders lobbied Congress to overturn the effect of the *Bildisco* decision, and Congress did so in the July 1984 amendments to the Bankruptcy Code (11 U.S.C. section 1113, "Rejection of collective bargaining agreements"). Although they still allow employers to reject collective bargaining agreements, these amendments establish standards for judging the reasonableness of the rejection in light of good-faith efforts to negotiate modification of the agreements. In the first court test of the 1984 amendments, *In re Wheeling-Pittsburgh Steel Corp.* (W.D. Pa. 1985), the district court sustained an employer's rejection of wage provisions of a union contract under section 1113, even though it was arguable that the employer had not bargained in good faith on the wage concessions. The union was holding out for further bank lenders' concessions before agreeing to the wage concessions. Upon appeal (May 1986), the Third Circuit Court of Appeals remanded the case to the district court, finding that the standards for rejection established by section 1113 of the Bankruptcy Code had not been met.⁶

In the *Dalkon Shield* (intrauterine device) litigation, a Chapter 11 filing by the A.H. Robins Company (March 1986) was intended to forestall future product liability claims against the company. At the date of filing, Robins had settled 9,300 claims for \$517 million, with 5,000 more claims still pending. As in the *Johns-Manville* case, the *Robins* filing was intended to cut off future product liability claims and to enable the rest of the company to continue operating without the burden of those claims. However, enough allegations of high-level corporate malfeasance emerged in the *Robins* case that the court appointed a special monitor to review the ongoing operations of senior management. Management remains in control of the company at this writing?

4 See, e.g., Mark J. Roe, *Bankruptcy and Mass Tort*, 84 *Columbia Law Review* 846 (1984); Note, *The Manville Corporation bankruptcy: an abuse of the judicial process?* 11 *Pepperdine Law Review* 51 (1983); Note, *Manville: good faith reorganization or "insulated" bankruptcy?* 12 *Hofstra Law Review* 121 (1983); Note, *Manville corporation and the "good faith" standard for reorganization under the Bankruptcy Code*, 14 *University of Toledo Law Review* 1467 (1983); Note, *Manville bankruptcy: treating mass tort claims in Chapter 11 proceedings*, 96 *Harvard Law Review* 1121 (1983).

5 A thorough account of the *Bildisco* decision, 465 U.S. 513 (1984), and the enactment of the collective bargaining provisions of the Bankruptcy Code Amendments of 1984 is Thomas R. Haggard, *The Continuing Conflict Between Bankruptcy and Labor Law -- The Issues that Bildisco and the 1984 Bankruptcy Amendments Did Not Resolve*, 1986 *Brigham Young University Law Review* 1. See also, Benjamin Weintraub and Alan N. Resnick, *Bankruptcy Law Manual, Problems with labor Unions: Rejecting Collective Bargaining Agreements*, paragraph 8.11 (9) (1986). See *In re Bildisco*, 682 F.2d 72 (3d Cir. 1982).

6 *Wheeling Pittsburgh Steel Corp. v. United Steelworkers of America*, 791 F.2d 1074 (3d Cir. 1986).

In other aggressive filing developments under the Bankruptcy Code, a new line of cases is evolving that might limit corporations' capacity to cut off liability for toxic waste pollution of the environment by filing Chapter 11 petitions. In January 1986, the United States Supreme Court decided, 5-4, that bankruptcy trustees may not abandon corporate property under 11 U.S.C. section 554 (a) that is burdensome to the bankruptcy estate if the abandonment causes environmental damage that contravenes state laws or health and safety regulations. The case decided in January 1986 was *Midlantic Bank v. New Jersey Department of Environmental Protection*, which was an appeal of two 1984 Third Circuit cases involving Quanta Resources Corporation.⁸ It is noteworthy that, in the *Midlantic* case, Justice Rehnquist wrote the dissenting opinion which stated, in relevant part:

The Bankruptcy Court may not, in the exercise of its equitable powers, enforce its views of sound public policy at the expense of the interests the Code is designed to protect. In these cases, it is undisputed that the properties in question were burdensome and of inconsequential value to the estate. Forcing the trustee to expend estate assets to clean up the sites would plainly be contrary to the purposes of the Code.

The *Midlantic* case involved a liquidation, but comparable concerns would arise in Chapter 11 cases if abandonment of contaminated property seemed essential to achieving a financially successful corporate reorganization. In the future, it is not inconceivable that corporations would attempt to cut off toxic waste liability by filing Chapter 11 petitions with the intent to abandon contaminated property. At present, the weight of court decisions appears to be against such aggressive use of Chapter 11 petitions.⁹

The original bankruptcy court order in the *Bildisco* case was issued in 1981. Since then, *Bildisco* has had two progeny worthy of note: *Wilson Foods* and *Continental Air Lines*. In

April 1983, Wilson, then the fifth-largest meat packer in the United States, filed a Chapter 11 petition in Oklahoma. Wilson then unilaterally rejected collective bargaining agreements covering two-thirds of its employees and reduced wages by 40 to 50 percent. Wilson's petition showed an estimated positive net worth of more than \$67 million. After reducing wages, Wilson was reported to have obtained a new line of credit for \$80 million from a New York City bank.¹⁰

In September 1983, Continental, then the eighth-largest airline in the United States, filed a Chapter 11 petition in Texas. Continental had been bargaining with its employees for wage concessions as part of a corporate strategy for becoming an efficient, low-cost carrier in a deregulated environment. After the filing, Continental unilaterally rejected contracts with several unions, including the pilots' union. All employees temporarily were laid off. A few days later, one-third of the employees were recalled, but new wages were reduced from former levels by more than half in some instances. Although Continental had a heavy debt burden at the time of filing, net worth still was positive. The reorganized Continental, together with low-cost affiliates such as New York Air, is a strong competitor over major airline routes in the United States and on certain international routes; furthermore, it is usually mentioned as a potential acquirer of other, troubled airlines. During the spring and summer of 1986, Continental's parent company, Texas Air, was involved in negotiations to acquire Eastern Airlines and People Express. At this writing, it appears that those acquisitions will be consummated.

Taking the Chapter 11 baton from Continental is *Frontier Airlines*, a unionized carrier serving the western United States that was acquired in 1985 by the ultimate low-cost air carrier, People Express. Facing a heavy debt burden and expanded price competition over most of its domestic routes, People Express offered Frontier for sale in the late spring of 1986. One potential acquirer, United Airlines, was close to completing the purchase of Frontier but, as of this writing, has not done so.

One of the obstacles to United's acquisition of Frontier was its inability to negotiate

⁷ See *A.H. Robins Co. v. Piccinin*, 788 F.2d 994 (4th Cir. 1986). The Fourth Circuit upheld a preliminary injunction staying all claims arising from Dalkon Shield litigation against personally named co-defendants (typically, officers and directors of Robins) once the Robins Chapter 11 petition was filed. This decision is viewed as an affirmation of the broad injunctive powers of a bankruptcy court to stay all claims involving a debtor reorganizing under Chapter 11.

⁸ *Midlantic*, 474 U.S. _____, 88 L.Ed.2d 859 (1986). The Supreme Court made a similar finding in the case of *Ohio v. Kovacs*, 469 U.S. _____, 83 L.Ed.2d 649 (1985). In *Kovacs*, the Supreme Court held that a discharge in bankruptcy was allowed for a debtor whose property was seized by a state receivership which began to clean up a toxic waste site and then ordered the debtor to pay for the clean-up. The Supreme Court left for another ruling (*Midlantic*) the resolution of the issue of allowing bankruptcy trustees to abandon contaminated property.

⁹ In *United States v. Maryland Bank & Trust Co.*, _____ F.Supp. _____ (D. Md.), slip op. Apr. 9, 1986), the environmental protection laws were extended to enable the Environmental Protection Agency to maintain lawsuits against innocent parties foreclosing on contaminated property and to require them to pay for the costs of cleaning up the property. It is believed that such precedents will complicate Chapter 11 proceedings in the future by raising the spectre of unsecured liabilities in amounts that, if not stayed or discharged, would disrupt the orderly reorganization of companies operating under Chapter 11 in cases involving infringement of environmental protection laws.

¹⁰ Graeme Browning, *Using Bankruptcy to Reject Labor Contracts*, 70 *American Bar Association Journal* 60 (Feb. 1984)

a mutually satisfactory transitional salary scale for Frontier's pilots, who generally earned less than United's pilots. Other potential acquirers of Frontier apparently were willing to purchase it only if the collective bargaining agreements with the principal Frontier unions were rejected. People Express apparently threatened to file a Chapter 11 petition for Frontier in order to induce Frontier's unions to be more forthcoming. Thus, the Frontier case illustrates another variation of the aggressive use of Chapter 11 filings: The threat to file becomes a bargaining chip in labor negotiations. United's negotiations regarding Frontier were interrupted by the filing of a Chapter 11 petition for Frontier on August 28, 1986.¹¹

One debtor that has shown real initiative following a bankruptcy reorganization is *Wickes corporation*, a California-based building supply company that filed its Chapter 11 petition in April 1982, shortly before the upturn from the 1981-82 recession began. Reorganized under strong management, Wickes reduced operating expenses, closed unprofitable stores, and renegotiated or rejected a number of building leases for its stores. Wickes emerged from Chapter 11 in early 1985. A year later, in April 1986, Wickes attempted to acquire the National Gypsum Corporation for approximately \$1.2 billion. After that takeover attempt failed, during August 1986, Wickes mounted a new hostile tender offer for Owens-Corning Fiberglas Corporation, Toledo, Ohio. Wickes apparently intended to finance the tender offer with an issue of so-called "junk bonds" and with the planned post-acquisition sale of Owens-Corning operations not closely related to the core operations of Wickes. The tender offer was valued at \$2.1 billion. On August 29, 1986, Wickes terminated the offer, but analysts estimated that Wickes had a net gain of at least \$30 million from the increased value of Owens-Corning shares acquired during the takeover attempt. It is significant that a company that not long ago filed a Chapter 11 petition, apparently in good faith, has been able to mount hostile tender offers for multi-billion-dollar corporations within little more than a year after ceasing to operate under the supervision of a bankruptcy court.

V. Implications for the Bankruptcy System

The sequence of all the cases cited above is a signal that something might be wrong in the bankruptcy system. For bankruptcy specialists, and for economists generally, those cases are like,

in the words of Thomas Jefferson, a "fire-bell in the night....[W]e have the wolf by the ears, and we can neither hold him, nor safely let him go. Justice is in one scale, and self-preservation in the other."¹² Jefferson was writing about the pernicious effects of slavery on the preservation of the Union and about the controversies raised by the Missouri Compromise. The message of those words, however, for defenders of the notions of a free market and of market discipline in American enterprise, is that actions currently taken under Chapter 11, while perfectly legal under the present Bankruptcy Code, may be moving inexorably in the direction of a race to the courthouse to enable solvent, albeit troubled, corporations to gain positive advantages over competitors. Such a race for competitive advantage through the legal process eventually undermines the free-market system, as well as the other laws overridden by the Bankruptcy Code, such as environmental protection or labor laws.

Yet, competitors in any line of business "have the wolf by the ears" in that they cannot safely renounce the use of Chapter 11 filings as a means of reducing operating costs unless *all significant* competitors in that line of business refrain from filing as long as they are solvent. Thus, justice (fair play) demands that all solvent competitors refrain from filing, but self-preservation demands that all competitors retain the capacity to file as long as any significant competitor has that capacity.

If efficiency in the market is achieved most easily by becoming a low-cost producer under the protective umbrella of a Chapter 11 filing, why should any corporation exert itself to achieve efficiency by bargaining and by open competition in a free market? Before 1978, a showing of insolvency was a prerequisite of a Chapter 11 filing, but that requirement was dropped in the present Bankruptcy Code.¹³ The question now presented is whether the benefits that were supposed to flow from the removal of the requirement of insolvency have been outweighed by the deficiencies — if they are, in [act, deficiencies — of the present statute. After all, in the words of one bankruptcy expert,

Chapter 11 is supposed to be rehabilitative,.. a device "which can be used to cure a company that's ill or hemorrhaging." It is better to apply the cure while a company "has strength and vitality left — before letting it die."¹⁴

11 Press reports in early September 1986 indicated that Armco, a major producer of steel, also allegedly was using the threat of a Chapter 11 filing to induce its employees' union to make wage concessions. In fact, the union agreed to the concessions and no Chapter 11 petition was filed.

12 Letter from Thomas Jefferson to John Holmes, April 22, 1820, in *The Portable Thomas Jefferson* 567, Merrill D. Peterson ed. (1975, reprinted 1980).

13 Browning, *supra* note 10

Thus, it is important to remember that not all observers believe that the present uses of Chapter 11 are all bad. The issue of good faith in filing could be addressed satisfactorily by scrutinizing Chapter 11 filings in light of the question: "Is this company financially troubled enough to justify the filing?" By that standard, some of the recent Chapter 11 filings (for example, *Wickes*, *LTV*, and *Frontier*) might not be particularly troublesome.

VI. summary

The law of bankruptcy has been intended since 1898 to grant debtors relief from claims of unsecured trade creditors, bank lenders, and the like, but not to affect substantially the claims of employees for accrued, but unpaid, wages and benefits, or the claims of governmental units for taxes. Such claims were, and still are, given priority in the distribution of assets of bankruptcy estates. Since 1982, a new trend has emerged in which aggressive bankruptcy filings are used to achieve the greater financial objectives of the corporations filing Chapter 11 petitions. The 1984 amendments to the Bankruptcy Code were intended to rein in perceived abuses of the corporate capacity to disavow employment contracts. Some may argue that the July 17, 1986 filing by LTV Corporation was yet another corporate effort in the direction that was opposed by the 1984 amendments. It is possible to contend that the filing was designed to enable LTV to modify its collective bargaining agreements substantially or to reject future liability for employee benefits, including pension or insurance liabilities. On the other hand, LTV clearly was having financial troubles, and issues regarding the good faith of its failing still have to be resolved by the bankruptcy court.

The cases described above fall into three broad categories:

1. Contingent products liability or environmental protection

Johns-Marville (1982)

A.H. Robins (1986)

Midlantic (1986) (Chapter 7)

2. Executory collective bargaining agreements

Bildisco (1981-1984).

Wilson Foods (1983)

Continental Air Lines (1983)

Frontier Airlines (1986)

3. Restructuring and downsizing corporate liabilities

Wickes (1982)

LTV (1986).

The Supreme Court thus far seems to be sustaining the primacy of bankruptcy considerations in the second and third categories of cases, while continuing to sustain the primacy of environmental protection laws in cases that do not involve mass tort litigation.

In any case, it is clear that companies with the benefit of the protection afforded by Chapter 11 filings have advantages in corporate financial structure that are not available to similarly situated, but presumably solvent, competitors who do not file. Thus, it is reasonable to predict that, in a disinflationary environment, an increased number of aggressive Chapter 11 filings will occur in any industry in which a significant competitor alters its costs of production by filing a Chapter 11 petition. In the absence of a more orderly, formal procedure for downsizing corporate assets and liabilities in the United States, such a use of Chapter 11 is neither illogical nor completely unforeseeable. The remedy for aggressive uses of Chapter 11, if a remedy becomes desirable as a matter of public policy, is to be found by following the traditional path of Congressional enactment of corrective amendments of the Bankruptcy Code.

At the same time, the purpose of the 1978 revisions of Chapter 11 should be kept in mind: The rehabilitation of ailing companies should be effected before they become terminally ill. If nothing concentrates the mind like the prospect of being hanged, then the opportunity for a debtor to file a Chapter 11 petition before its case is terminal ought to serve a constructive purpose: It should encourage lenders, employees, and the company's other constituent groups to cooperate in attempting to improve the chances for restoring the company's competitive viability in order to avoid the filing. The same spirit of cooperation should prevail if a filing occurs despite everyone's best efforts.