Statement of
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before the
Committee on Finance
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SUMMARY OF STATEMENT BY RUDOLPH G. PENNER
DIRECTOR, CONGRESSIONAL BUDGET OFFICE
BEFORE THE COMMITTEE ON FINANCE,
U.S. SENATE-APRIL 24, 1985

It is CBO's belief that the growing U.S. budget deficit has attracted capital from abroad, thus raising the foreign exchange value of the dollar and seriously damaging the competitiveness of U.S. export and import-competing industries. An across-the-board import surcharge would be no panacea for these problems. If everyone believed that an import surcharge were to be permanent, and if there were no foreign retaliation to the surcharge, it would have the following effects:

- o A rise in the value of the dollar and a decline in foreign real GNP, thus hurting exporters;
- o An ambiguous effect on U.S. interest rates because of offsetting factors;
- o A rise in the price of imports and import-competing goods, thus hurting consumers and industries that use these goods as inputs;
- o A rise in demand for products of industries that compete with imports, thus helping those industries;
- o A fall in the U.S. budget deficit;
- o An improvement in the U.S. trade and current account deficits (if the dollar did not strengthen too much).

The greatest threat posed by the proposed surcharge is a trade war that would unquestionably reduce the well-being of all concerned. The proposed import surcharge would actually raise the average tariff for all imported goods above the average level attained by the Smoot-Hawley Tariff Act of 1930.

Mr. Chairman, it is a pleasure to appear before this Committee to discuss the proposal for an import surcharge as one means of compensating for the effects of real dollar appreciation on U.S. international trade. The tremendous growth in the U.S. trade deficit over the last three years has been the consequence of a number of factors, including strong economic growth in the United States relative to that in the rest of the world. It is CBO's belief, however, that the growing U.S. budget deficit has been an important factor in the deterioration of the U.S. trade balance, as the burgeoning flow of public debt has raised interest rates and thereby attracted capital from international capital markets. That, in turn, has raised the foreign exchange value of the U.S. dollar and seriously damaged the competitiveness of U.S. export and import-competing industries. Some groups would counter the effects of the budget deficit with a temporary surcharge on all U.S. imports in the hope that it would protect U.S. industries, reduce U.S. demand for foreign exports, lower the U.S. trade and current account deficits, and depreciate the dollar, while directly providing revenues to reduce the budget deficit.

My testimony today evaluates these claims. No doubt an import surcharge on the order of 20 percent would have significant effects on the federal deficit, the trade and current account balance, domestic and foreign inflation, domestic and foreign real GNP growth, and the efficiency of resource utilization both at home and abroad. Unfortunately, this last point is one that is often slighted in discussions of an import surcharge.

Consequently, my testimony begins with a qualitative assessment that emphasizes the nature of the efficiency costs. A more detailed and rigorous evaluation can be found in Attachment A.

SUMMARY OF QUALITATIVE ASSESSMENT

Economists have long extolled the gains from free international trade. It allows countries to concentrate their scarce resources on the production of goods where they are relatively efficient and then to use those goods in trade with other countries to obtain goods that, because of climate or other factors, could not be produced in their own country at all or that could only be produced at relatively high cost. Thus, international trade increases the efficiency of world production by "allowing specialization and generally increases the welfare of all participating countries.

Not all individuals within countries will necessarily gain from international trade, however. As countries specialize more, the demand for some types of labor, capital, or land increases while it is reduced for others. But the winners win much more than the losers lose, and the former could easily compensate the latter for their losses while still enjoying a net gain in their own welfare. Unfortunately, it is difficult to arrange such transfers of income in practice, and one often hears demands for protection from groups of those who are hurt. Since such groups are often successful, all countries resort to some degree of protection despite the obvious advantages of free trade. Nevertheless, since World War II there has been a strong trend toward a world of increasingly free trade.

The foregoing analysis rests on a number of simplifying assumptions, and there can be exceptions to the rule that countries are likely to lose if they impose tariffs or other barriers to free trade. Only the most important exceptions are discussed here, while others are analyzed in Attachment A.

The two most important assumptions implicitly made above are: first, that labor and capital are fully employed in all countries; and second, that the situation is not complicated by changing international capital flows.

If there is full employment, any increase in the output of the goods that a country produces less efficiently must be offset by reduced output of the goods that a country produces most efficiently. But suppose that unemployment exists in a country. Can it use a tariff to increase the output of goods it produces less efficiently while not losing any output in its most efficient industries?

A tariff has two opposite effects on aggregate demand within a country. First, a tariff is, in essence, an excise tax and, like any other tax, it reduces private income. But some part of the reduction in income resulting from a U.S. tariff may be shifted onto other countries. To the extent that this happens, overall demand for U.S. goods will be reduced as foreign countries can afford to buy less of our exports. In the most likely case, however, the prices charged by foreign exporters will not fall by the entire

amount of the tariff. Some of the tax will be paid by U.S. residents, and they will have less income to spend on U.S. products. At the same time, since the tariff will raise the price of foreign products relative to that of competing U.S. products, it will divert demand toward the latter. Since it is not clear which effect will predominate--that of lower U.S. and foreign private income or the better competitive position of certain U.S. products—U.S. employment could either rise or fall. Of course, none of these effects considers the possibility of retaliation. If that occurs, employment is almost certain to fall in all countries.

More important, the complexity of the effects outlined above illustrates that the imposition of a tariff aimed at manipulating U.S. employment would be an awkward and uncertain endeavor. There are more direct approaches to manipulating employment. In the current environment, monetary policy provides a most important option.

In the remainder of this section of my testimony, it will be assumed that monetary policy is directed toward certain employment goals and that it offsets any employment effects--positive or negative--of a tariff. That is, of course, a vast oversimplification. Monetary policy has many goals other than manipulating employment, the control of inflation being the most important. Moreover, even if employment were its only goal, the degree of fine tuning implied by our assumption would be extremely difficult, if not impossible, to obtain in practice. But the assumption that employment is

held constant may not be far from the truth, and it is convenient analytically because it allows CBO to focus on other effects of a surcharge in the base case.

In addition, it will be assumed initially that there will be no foreign retaliation in response to new U.S. tariffs and that everyone believes that the tariff will be permanent despite any official claims to the contrary. This then leaves the difficult problem of what happens to international capital flows.

Some would argue that, if employment is assumed to be constant, the tariff, by reducing the U.S. budget deficit, will reduce U.S. interest rates, thus causing an increased outflow or lowered inflow of international capital. This effect could be offset, however, by foreign producers' deciding to circumvent the new tariff wall by moving production to the United States. Although foreign producers could, in theory, finance new U.S. production facilities by drawing on U.S. capital markets (an attractive option, if U.S. interest rates actually fall), they may also bring some foreign financing with them. Moreover, the situation is confounded further by uncertainty about what happens to foreign interest rates in response to any fall in U.S. rates.

Consequently, given these simplifying assumptions, changes in international capital flows could, by themselves, exert either upward or downward pressure on the value of the U.S. dollar. It is CBO's judgment,

however, that the effects would not be large either way and that the. change the value of the U.S. dollar would be dominated by the tariff's effect on trade flows. As a result, the foreign exchange value of the U.S. dollar is sure to rise. The reason is that the amount of dollars paid to foreigners for imports will fall either because the world price falls by the entire amount of the tariff or because the tariff raises the U.S. price of the goods and the quantity demanded falls. In most cases, it is reasonable to expect some fall in the price paid to foreign producers and some rise in the price paid by U.S. buyers, with the size of each effect varying greatly from product to product. 1/

In summary, under the simplifying assumptions made thus far, the most likely effects of a tariff would be:

- o a rise in the value of the U.S. dollar, which would hurt U.S. exporters;
- o a rise in the U.S. price of imports and competing goods, which would hurt heavy consumers of imports and industries that use imports or competing goods as inputs;
- o a rise in the demand for the products of industries that compete with imports, which would help those industries; and
- o a fall in the U.S. budget deficit because of the revenue implications of the tariff.

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1. To the extent that the world price of imported goods falls, there is a benefit to the welfare of the importing country. In theory, this effect can be large enough to more than offset the loss in efficiency imposed by the tariff. This possibility provides an exception to the rule that tariffs reduce domestic welfare. But to obtain this result, the tariff has to be set at precisely the right level, and that level varies from good to good. Jt is extremely unlikely that an across-the-board tariff could result in such a welfare gain.

The effects of a tariff on the industrial composition of U.S. output are considered in more detail in the last section of this testimony.

The effect of a tariff on U.S. interest rates is ambiguous. Beneficial effects will result from reducing the budget deficit and from any increase in the supply of foreign capital accompanying foreign investment in production facilities that are designed to circumvent the tariff wall. On the other hand, if the tariff has a net expansionary impact, by assumption it will be countered by a contractionary monetary policy in order to keep employment constant.

Thus far, this analysis has not considered the possibility of retaliation in detail. Because the United States is so important in world trade, it is almost certain that a surcharge will result in a significant loss of economic welfare for the rest of the world. Since the major trading partners of a large, tariff-raising country unambiguously suffer losses in economic welfare, they have every motivation to band together to raise their own tariff or nontariff barriers to trade vis-a-vis the large country. The precise effects of this retaliation depend on the height and the type of trade barriers that are raised, which are almost impossible to predict. It is doubtful, however, that the trading partners will be able to raise their welfare back to its initial level before the surcharge was imposed. The large country may be able to improve its economic welfare somewhat by imposing the import surcharge. After foreign retaliation, however, the

large country is almost certain to suffer a net loss in economic welfare compared with its initial, presurcharge situation. Hence, even though there is a possibility that one or another country may enjoy a net gain in economic welfare after retaliation, the most likely outcome is that all countries will be worse off than they were initially.

Of course, the possibility exists that retaliation may lead to counter-retaliation, and ultimately to a trade war. The volume of world trade, already depressed prior to retaliation, would decline even further, and the internal distribution effects would likely be more severe. In fact, if retaliation escalates, the volume of trade between the large country and the rest of the world could dwindle to almost nothing. The end result would be a drastic reduction in economic welfare for both the United States and its trading partners.

Retaliation also might take forms other than the imposition of tariffs against U.S. products. Angry allies might contribute less to mutual defense or take other actions designed to make life painful for the United States.

The foregoing analysis has assumed that private economic agents expect a U.S. import surcharge to be permanent. If people making economic decisions believe that a U.S. import surcharge would be only temporary, these conclusions could change considerably.

One possibility is that U.S. citizens might not change their consumption behavior at all, but would absorb the full impact of the temporary surcharge by dipping into their savings. If real expenditures on imports did not decline, there would be no positive expenditure-switching effects. Moreover, there would not be a direct contractionary fiscal-policy effect, because the temporary decline in private savings would fully counteract the loss in purchasing power caused by higher tariff collections. A surcharge would reduce the federal deficit more since tariff revenues would remain at a high level as long as the import surcharge stays in place. This reduced federal deficit is unlikely to have any significant effect on real interest rates, however, because it would be offset by the fall in private savings.

This is not the only possible outcome, of course, because not all U.S. citizens may be willing to sustain higher spending on imports. For instance, manufacturers who use imported inputs in their production processes may simply postpone purchases from abroad. If the majority of importers postpone their import purchases until the surcharge is lifted, and if simultaneously U.S. citizens conclude that American goods are poor substitutes for import goods, a number of conclusions would change dramatically. The U.S. trade balance and current account balance would improve sharply. The expenditure-switching effect would be muted because of the limited acceptability of American substitutes. But there would be only a slight direct contractionary fiscal-policy effect because postponed

import spending yields no tariff revenues. Nonetheless, the rise in the private-saving ratio would lower domestic interest rates somewhat, and this would indirectly raise U.S. real GNP. As a result, there would be some improvement in the federal deficit.

Other forces, however, work to confuse the issue further. If private markets expect a U.S. import surcharge to be truly temporary, foreigners who might engage in direct investment in the United States would know that there would be no permanent tariff wall to protect U.S. markets in the future.

Because a U.S. import surcharge would reduce foreign real GNP significantly, the greatest threat posed by the proposed import surcharge is a trade war, which would unquestionably reduce the well-being of all concerned. History demonstrates the plausibility of a retaliatory tariff scenario. When the United States passed the Smoot-Hawley Tariff Act of 1930, many foreign countries imposed substantial tariffs of their own. Smoot-Hawley raised tariff levels on dutiable imported goods to an average level of 53 percent in 1932, an increase of 33 percent over 1929 levels. Retaliation led to a downward spiral in international trade, and U.S. exports as a percentage of GNP fell by close to one-half between 1929 and 1932. The proposed import surcharge would actually raise the average tariff for all imported goods above the average levels attained by the Smoot-Hawley Tariff Act. At each step of the retaliatory process, a country raising its

trade barriers may either raise or lower its own real GNP somewhat, but the reduction in foreign real GNP is likely to be greater. Consequently, depending on how many retaliatory rounds are allowed, the reduction in world trade and world real GNP could be substantial. If retaliation were to accumulate and get out of hand, there would be a danger of serious worldwide economic decline.

The preceding discussion of the import surcharge has suggested that a quantitative assessment of the likely impacts of a proposed surcharge is a complex task. In this case, the factors conditioning the outcome include, among others, the degree to which foreign producers absorb the higher tariff by lowering their supply prices, the likelihood and extent of retaliation (resulting perhaps from some assumed movements in foreign incomes and production), the response of the domestic monetary authority, and, typically, changes in net capital flows. In evaluating the proposed surcharge, it is critical to examine the sensitivity of the model simulation results to changes in these (and perhaps other) conditioning factors. In addition, the choice of a particular model itself is a conditioning factor. The model must be robust in the sense that it must be flexible enough to incorporate such factors as, for example, the substitutability of imports for domestically produced goods.

A number of quantitative evaluations of import surcharge policies have recently been performed. In interpreting their results, the critical

question pertains to the robustness of the conclusions. To explicate matters, I will adopt a specific example, a study published by Data Resources, Inc. (DRI). 2/

The DRI study examines the macroeconomic effects of a temporary import surcharge, phased out (20-15-7) over a three-year period. Their analysis assumes mitigating adjustments in the domestic money supply and no foreign retaliation. Simulation of the policy on the DRI quarterly macroeconomic model (over the 1986-1992 period) yields long-term improvement in both the federal deficit and the external trade balance at the expense of near-term adverse impacts on real output, employment, productivity, prices, and the exchange rate--adverse effects that are, however, decidedly reversed in the out-years after the surcharge is removed. Because of the improvement in real activity by 1992, along with a permanently lower debt-output ratio, the DRI results reflect relatively favorably on the surcharge proposal.

How robust are the DRI results? The Congressional Budget Office has completed a detailed examination of this question which is presented in Attachment B to this testimony. I will only summarize the CBO review here.

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2. See C. Caton, "The Effects of a Temporary Import Tariff," DRI Review of the U.S. Economy, March 1985, pp. 13-20.

The DRI study analyzes the import surcharge under a very specific set of conditioning factors. These factors include the assumptions that 50 percent of the surcharge is absorbed by foreign exporters, no foreign retaliation takes place, and the domestic monetary authority is passive initially in allowing the money supply to increase with the rise in the price level and takes a decidedly expansionary stance only when the economy has been significantly weakened. Since the study reports results for a single simulation using one set of conditioning factors, the study is only a partial evaluation of a surcharge policy.

Substitution of alternative conditions that are no less plausible is likely to lead to a substantially different outcome--a fact noted but not explored in the DRI study. For example, the CBO review concludes that the long-run optimistic results reported by DRI regarding real activity are most sensitive to the assumption regarding monetary policy. In particular, if an alternative, less expansionary response is assumed, the long-run gains in real activity reported by DRI are likely to be offset if not reversed.

Put another way, the crucial role assumed for monetary policy in the DRI simulation means that the simulation may reveal as much about the effects of a particular monetary stance, viewed in the confines of a very specific model, as it does about the effects of a surcharge. Unfortunately, there are few things that economists argue about more vigorously than the

impact of changes in monetary policy. Relatively small, plausible changes in the structure of a model can greatly alter the results regarding its power and, therefore, all model results have to be viewed with a healthy dose of skepticism.

While the relative merits of any single set of assumptions may be a matter of debate, no quantitative analysis is possible without making this choice. In some policy simulations, conclusions remain the same under a wide variety of assumptions. Unfortunately, this is not the case in analyzing the effects of an import surcharge.

EFFECTS ON PARTICULAR U.S. INDUSTRIES

As already noted, an import surcharge would have very significant impacts on the composition of economic activity, as measured by production and employment in particular sectors. In general, industries directly competing with imports would tend to gain, while industries relying on either foreign inputs or export sales would tend to suffer. However, even this simple statement must be qualified. Many industries simultaneously fit into each of these categories; that is, they use foreign inputs, they export, and they directly compete with foreigners in the sale of their products to U.S. customers. The magnitude of employment and production effects for any specific industry depends on market conditions for its particular inputs and goods sold. For example, it would depend on the degree to which the import

surcharge could be pushed back on foreign suppliers of inputs or on how responsive the consumers of the industry's products are to price increases.

By altering the prices and demands faced by individual industries, a series of interindustry adjustments would follow the imposition of a surcharge. These adjustments would take the form of movements of both workers and capital. Some workers would find better employment opportunities while others would be worse off. Moreover, since production costs would tend to increase and demand for outputs would respond to prices charged, even expanding industries might find that profits do not increase.

The potential for specific industry effects can be crudely seen in Tables 1 and 2, which list the largest importing and exporting industries (by value of shipments). As noted, industries competing for sales with imports are potentially helped, while industries relying on imports as an input are potentially hurt. Of the leading importing industries, intermediate products used in the production of other goods are very highly ranked. Oil and natural gas top the ranking. Any increase in the prices of these goods will tend to filter through the rest of the economy, raising prices elsewhere.

The least ambiguous effects of a surcharge relate to exporting industries. They will very likely be hurt. Foreign demand for their output will fall with reduced foreign incomes; their production costs will tend to rise if they use imported inputs; and the rising value of the dollar will make

their products even more difficult to sell abroad. Furthermore, exporting industries would be the likely target of any foreign retaliation to a surcharge. Note that three important agricultural products--corn, wheat, and soybeans--are contained in the list of our top six exports. Clearly, agriculture would be badly hurt by a surcharge, as would be high value-added articles such as aircraft and computers. Automobiles are a special case since they are high on both the import and export list.

Precise estimation of the effects on individual industries is difficult. Nevertheless, past industry price, trade, and output behavior does allow for a crude ranking of the effects of an import surcharge. Using various statistical estimates of market responses, the CBO has simulated the effects of a surcharge on major manufacturing industries. Some industries, such as those producing iron and steel or petroleum products, appear to have both large output price increases and large increases in domestic production and are thus benefited; others such as paper and chemicals are much less affected in terms of either prices or outputs. As might be expected, the variation across industries is substantial.

TABLE 1. LEADING ITEMS IN U.S. GENERAL IMPORTS FROM THE WORLD IN 1984 (Customs value, in thousands of dollars)

Standard Industrial Classification Number	Description	1984
1311	Crude petroleum and natural gas	40,039,917
3711	Motor vehicles and passenger cars	36,980,202
2911	Petroleum refinery products	21,450,382
3714	Parts of motor vehicles	11,043,061
3312	Blast furnace and steel mills	10,122,957
3651	Radio and TV receiving sets	9,373,239
3674	Semiconductors and rectifiers	7,262,587
3339	Primary nonferrous metals	6,400,083
9800	United States' goods returned	5,629,161
3579	Office machines and typewriters	4,670,976
2621	Paper mill products	4,624,035
3662	Radio and TV communication equipment	4,198,883
3573	Electronic computing equipment	4,198,520
2369	Outerwear of textile materials	4,109,912
0173	Tree nuts	3,750,877
3915	Jewelers' materials	3,015,638
3861	Photographic equipment and supplies	2,974,625
2421	Lumber and other sawmill products	2,866,198
3679	Electronic components and accessories	2,788,121
9900	Miscellaneous commodities	2,783,340

SOURCE: U.S. Department of Commerce.

TABLE 2. LEADING ITEMS IN U.S. TOTAL EXPORTS TO THE WORLD IN 1984 (f.a.s. value, in thousands of dollars)

Standard Industrial Classification Number	Description	1984
3573	Electronic computing equipment	13,815,733
3714	Motor vehicle parts and accessories	8,869,752
3711	Motor vehicles and passenger cars	7,064,415
0115	Corn, unmilled (including seed)	7,043,789
0111	Wheat, unmilled	6,476,910
3721	Aircraft	5,807,383
0116	Soybeans	5,438,161
3674	Solid state semiconductor devices	5,240,680
3728	Aircraft parts	5,144,522
2911	Petroleum refinery products	4,961,414
3900	Miscellaneous manufactures	4,800,624
2869	Industrial organic chemicals	4,800,303
1211	Bituminous coal and lignite	4,090,857
3531	Construction machinery	3,413,995
3662	Radio and television equipment	3,029,045
2819	Industrial inorganic chemicals	2,975,022
3533	Oil and gas field equipment	2,791,854
3569	General industrial machinery	2,757,304
9100	Waste and scrap	2,715,937
2821	Plastics materials and resins	2,660,683

SOURCE: U.S. Department of Commerce.

NOTE: f.a.s. - free alongside ship.

ATTACHMENT A

THE EFFECTS OF AN IMPORT SURCHARGE ON NATIONAL WELFARE: A QUALITATIVE ANALYSIS

Staff Working Paper
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The Congress of the United States
Congressional Budget Office

SUMMARY

International trade allows countries to specialize in the production of those things in which they have a comparative cost advantage, trading them for things they are relatively poor at producing. This specialization and exchange is of benefit to each country and harms no country. Trade is a positive-sum activity.

A U.S. surcharge of 20 percent on the value of imported goods, while benefiting some sectors of the economy, would unambiguously result in a net overall loss of worldwide economic efficiency and welfare by moving away from specialization and trade. The only real question is how this loss would materialize and who would bear its burden. In general, the country that imposes a restriction on its trade is likely to be one of the major losers as resources shift away from its most efficient (exporting) industries to less efficient (import-competing) industries that will be partly protected by the trade restriction.

The distribution, and even the form, of the welfare losses among countries is less clear. A small country imposing a tariff might have little effect on world prices and trade, and thus might bear nearly all of the losses itself. A large country, like the United States, might be able to shift part of the tariff burden onto the rest of the world by forcing down the world price of its imports (that is, forcing foreign producers to pay part of the tariff by

lowering their prices). This could conceivably be enough to at least offset the internal loss of economic efficiency resulting from the reallocation of resources away from low-cost industries to high-cost industries. By imposing the right tariff on each good imported, a large country might, in theory, even gain from protection. But it is unlikely that an across-the-board surcharge would have such an effect. Moreover, retaliation would be likely, and if that was followed by counter-retaliation everyone would be almost certain to lose, and by large amounts.

CAPITAL FLOWS AND EMPLOYMENT EFFECTS; THE BASE CASE

The above analysis draws largely on the pure theory of international trade, assuming full employment and easy substitution of resources and goods for one another in response to price changes. While many of the conclusions derived from this analysis are directly applicable to other situations, the effects of a surcharge become more complex in the context of a modern economy open to international capital flows and subject to some unemployment of labor and capital. These complexities relate largely to the potential effects the surcharge might have on international prices through exchange rate movements induced by capital flows, and on aggregate demand and supply. None of these complexities, however, would fundamentally change the results of the previous analysis.

To simplify the task of analyzing highly interrelated phenomena, the following analysis focuses on a base case that can later be modified. The base case is constructed so as to allow examination of the efficiency costs and sectoral effects of the surcharge. It assumes the following: no retaliation, no imposition of capital controls, and the use of the surcharge revenue to reduce the government budget deficit. In addition, private markets believe the surcharge to be permanent, despite official protestations to the contrary. This last assumption is necessary if the private sector is to be willing to undergo the adjustment costs necessary to reallocate resources and if foreigners are to consider direct investment in the United States as an alternative to trade. Finally, aggregate demand and real GNP are assumed to be unchanged. This assumption is derived from the fact that the surcharge would raise the domestic price of imports, thus encouraging the substitution of domestic goods for imported ones. At the same time, it would produce a contractive fiscal-policy effect by removing purchasing power from the economy. The substitution of domestic goods for imported goods would tend to raise total domestic output, whereas the contractive fiscal policy would tend to lower it. As a simplifying assumption, it is convenient to postulate that these opposite effects would offset one another.

Under these assumptions, if the surcharge had no immediate effect on exchange rates, it would: reduce foreign real GNP, lower the federal deficit, and improve the U.S. trade balance. But it would in fact have an

effect on the exchange rate because the combined GNP of all other countries will fall relative to U.S. GNP, strengthening capital flows to the United States and putting upward pressure on the dollar. Even if capital flows were not responsive to the relative strengthening of the U.S. economy, but were instead solely reflective of trade financing needs, the foreign exchange value of the dollar would rise in response to the surcharge-induced decline in U.S. imports.

To the extent that the import surcharge was considered by some to be a remedy for an overvalued dollar, it would be partially self-defeating. Since the surcharge would lower foreign real GNP, import-competing industries might be helped but exporters would be worse off: the dollar would be stronger while foreign real incomes would be lower, thus reducing overseas demand for U.S. exports; and the U.S. price level would be higher, as a result of the surcharge itself and because of higher domestic prices of close substitutes. Indeed, the strength of the foreign feedback effect on U.S. exports might by itself lower U.S. real GNP, unless a stimulative monetary policy was used to achieve the base-case assumption of no change in aggregate demand and real GNP.

Under the base-case assumptions, the main impact of the surcharge would be on the composition of production and final demand. It would raise domestic prices of imports and import-competing goods, thereby increasing revenues of import-competing industries and the prices paid for resources used intensively in these industries. Conversely, industries that rely heavily

on foreign imports would experience higher production costs, leading to fewer sales and ultimately less income. On the consumption side, higher costs of both imported and domestic products would cause welfare losses. Although the base case assumes no foreign retaliation, which restricts but far from eliminates the negative effect of the surcharge on U.S. exports, some negative effects could nonetheless be expected, as exporting industries would have to contend with a higher-valued dollar. Moreover, the foreign feedback effect mentioned earlier would also lower demand for U.S. export goods as lower incomes abroad translated into reduced foreign consumption. And, finally, should there be foreign retaliation in kind, the domestic compositional effects would be even more pronounced.

OTHER SCENARIOS

Some of the above conclusions could change if the surcharge was viewed as being truly temporary. One possibility is that consumers would not switch into domestic substitutes but would dip into savings to absorb the impact of the surcharge. This would reduce the stimulative effect discussed earlier. At the same time, continued spending on imports would bring in greater revenue to reduce the federal deficit. Since the effects of reduced private saving and the reduced public deficit would cancel each other out, no significant effect would be likely on real interest rates.

Another possibility is that import buyers would simply postpone their purchases in expectation that the tariff would elapse in three years (quite likely under a declining rate surcharge). In the extreme case, where most import purchases were postponed but U.S. citizens did not switch to domestic substitutes: the U.S. trade balance would improve dramatically, there would be no stimulative expenditure-switching effect, there would be no contractive fiscal policy effect because of the lack of tariff revenue, but the relative increase in private savings (as a result of postponed consumption) could lower interest rates.

Under either extreme possibility, the potential effects on capital flows and exchange rates are unclear. If GNP rose, capital inflows might be stimulated. But if the surcharge was viewed as temporary, foreigners might lack the incentive to jump the tariff wall and invest in the United States.

Finally, there is the possibility (indeed, history suggests the probability) of retaliation. Since the surcharge would impose large losses on other countries, they would have a strong incentive to retaliate (either individually or collectively) to recoup some of their losses. It is unlikely, however, that they could recoup much, and the most probable outcome is that everyone would be worse off. The volume of world trade would almost certainly decline, leading to even greater losses in economic efficiency and welfare.

It is quite possible that retaliation would lead to capital controls, heightened financial risk, and a reduction in foreign capital available to the

United States. If so, U.S. interest rates could rise significantly, output and income would fall, and the federal debt would skyrocket.

INTRODUCTION

Economists have long extolled the gains from free international trade and decried the losses of economic efficiency that result from international barriers to trade. One of the purposes of this paper is to describe how a U.S. import surcharge would result in losses of economic efficiency, and consequently of welfare, for the world at large and for the United States in particular. Another purpose is to highlight the considerations that would be strategic in designing an analysis to evaluate the effects of a U.S. import surcharge.

The paper is divided into several sections. Section I considers the effects of an import surcharge from the viewpoint of the pure theory of international trade, which assumes a world without money and without the possibility of short-run underemployment of labor and capital; Section I also assumes that foreign countries do not retaliate against a U.S. import surcharge by raising their own tariff or nontariff barriers to trade. Section II completes the discussion from the viewpoint of the pure theory of trade by considering the effects of a surcharge in the presence of foreign retaliation against the United States.

Section III expands the analysis to consider the effects of a surcharge on international capital flows and on employment of labor and capital in a monetary economy, but without the possibility of foreign retaliation. It is assumed in this part of the paper that private markets expect the import surcharge to be permanent despite official protestations to the contrary.

Given the great complexity of the real world, this section focuses on a base case under simplifying assumptions, and suggests how conclusions might be altered by changing some of the assumptions. Particular attention is paid to the compositional effects of an import surcharge on specific U.S. industries.

Section IV then considers what might happen if an import surcharge was perceived by private markets to be truly temporary. Section V concludes by considering the effects of foreign retaliation under real-world circumstances.

SECTION I: THE PURE THEORY OF INTERNATIONAL TRADE WITH NO RETALIATION

The pure theory of international trade describes a barter world in which there is no money, although goods exchange at relative prices very much as they do in a monetary economy, and the pricing system plays a key role in the allocation of real resources among alternative uses. The main difference between the monetary and the barter worlds is that, in the latter, prices of commodities are quoted in terms of other commodities rather than in terms of monetary units. 1/

1. The price of a commodity I in terms of another commodity II indicates the amount of II that must be sacrificed or traded in order to obtain one unit of I; it is the ratio of the number of units of II per unit of I in a voluntary market exchange. The price of commodity II in terms of commodity I is simply a reciprocal of this ratio. The barter price of I in terms of II correponds to what in a monetary world would be the ratio of the money price of I to the money price of II. Barter prices are relative prices.

In the general case, the barter or pure theory of international trade assumes that labor and capital can be substituted for one another in the production process in varying degree as their relative prices change, and that consumers shift their purchases from one good to another as their relative prices change. The pure theory of international trade is more suited to analyzing the long-run effects of a tariff than the short-run effects. It assumes that labor and capital are fully employed, which limits its applicability to the short-run situation. Even with such limitations, however, many of the important conclusions from the barter or pure theory of trade are directly applicable to analysis of underemployment situations in a monetary economy with international capital flows.

The imposition of import tariffs obviously reduces the volume of world trade. If countries do not trade with one another at all, relative prices of commodities in each country depend on such things as their supply of natural resources; their climate; the size, quality, and composition of their physical capital stocks; the size, education, and skill levels of their labor force; and consumer preferences. If countries trade freely with one another, relative prices tend to equalize in the world market. Consequently, for any country, the prices of commodities that were relatively high without international trade are lowered under free trade through imports of lower-cost goods. Similarly, the prices of commodities that were relatively low are bid up under free trade, and more resources are shifted into their production for export markets.

The welfare gains from free trade result, therefore, from enabling countries to specialize in the production of those goods in which each has a comparative cost advantage. According to the principle of comparative advantage, international specialization results in higher total world output of goods and services, and it is very unlikely that any country will be made worse off than it would have been without international trade.

Another consequence of specialization according to the principle of comparative advantage is that those factors of production that are relatively most important to the production of export goods earn higher incomes. If the production of export goods is capital intensive, the return to capital rises relative to the wage rate for labor; if production of export goods is labor intensive, the wage rate rises relative to the return to capital. In moving from the no-trade situation to the free-trade situation, then, there will generally be some winners and some losers within each country, and different geographical regions of the country can be affected quite differently.

Thus, the welfare gain from free trade is a potential gain in that everyone could have either more of all goods or, alternatively, the same amount of all goods with more leisure. Free trade for a particular country is better than no international trade, in the sense that there exists some pattern of domestic taxes and transfer payments that would allow everyone to be better off than without trade. Those who wanted free trade could reward those opposed to it for agreeing to move from the no-trade to

the free-trade situation, with the end result that everyone's welfare would be improved. Institutional restraints, however, often make it difficult to arrange such transfers in practice.

One relative price of particular importance to the barter theory is called "the terms of trade." It indicates the amount of import goods obtainable from one unit of exports, and can be thought of as reflecting the external purchasing power of exports. The introduction of tariffs on imports raises the domestic price to the consumer above the price charged on world markets--that is to say, above the price received by foreign producers.

In other words, the tariff causes the pattern of prices faced by consumers to move toward that which would exist without international trade, and consumers consequently shift their purchases toward import-competing goods. Because full employment is assumed, labor and capital must be drawn away from the export industries where they are used relatively efficiently and moved toward less efficient import-competing industries that have comparative cost disadvantages. As a result, there is an unambiguous loss of potential world welfare. In moving away from international specialization according to the principle of comparative advantage, potential world output of goods and services declines.

The distribution of the net loss of world welfare among countries is less clear. Even though an import surcharge almost certainly changes domestic prices, it may or may not change relative prices on world markets. If the country imposing the tariff is small compared with the rest of the

world--or if its trade volumes are small relative to trade volumes for the rest of the world--then the tariff has essentially no effect on world prices. In this case, the total effect of the tariff is absorbed by the relative price of the country's import-competing goods, which must rise by the full amount of the tariff. Taking all markets into consideration, when the country imposing the import tariff has no effect on world prices, the net loss of world welfare is largely borne by the country imposing the tariff.

If the country imposing the import tariff is large enough to have a substantial impact on world prices, there are very special circumstances in which the tariff can result in a net gain of national welfare. If the country imposing the tariff has enough market power so that a fall in its purchases of imports depresses their world price relative to the price of its exports, the gain in import goods obtainable per unit of export goods can more than offset the internal loss of economic efficiency resulting from reallocation of real resources away from low-cost industries to high-cost industries. Although there may or may not be a gain in welfare for the large country imposing the tariff, there is an unambiguous net loss of potential welfare for the rest of the world, and for the world as a whole, because other countries are certain to lose more than the tariff-raising country gains.

A big country may be able to devise an "optimal" tariff structure that raises its national welfare at the expense of the rest of the world--that is, if foreign countries do not retaliate by raising their own tariff or nontariff

barriers to trade. But in a world of many commodities and many factors of production, imposition of an optimal tariff structure would require an enormous amount of technical information relating to specific markets for internationally traded goods. Because market characteristics vary widely, an optimal tariff structure would generally consist of a complex system of subsidies as well as tariffs, of differing heights, imposed on export goods as well as on import goods. It is exceedingly unlikely that an across-the-board import surcharge would correspond to an optimal tariff structure for the United States.

Furthermore, regardless of whether the big country's economic welfare rises or declines on a net basis, an across-the-board surcharge results in substantial internal distributional effects under the assumption of full employment of capital and labor. In shifting resources from relatively low-cost industries to relatively high-cost industries, imposition of an import tariff raises the domestic prices of imports and import-competing goods, increases output of domestic import-competing industries, and raises the prices of factors of production that are relatively most important to the production of import-competing goods. At the same time, prices of export goods decline, fewer resources are devoted to export production, and the rewards of the factors of production that are relatively most important to those industries decline. On the consumption side, those domestic residents with a high propensity to consume imported and related goods lose, relatively speaking, because of the higher prices that they must pay for these goods.

SECTION II: THE PURE THEORY OF INTERNATIONAL TRADE WITH FOREIGN RETALIATION

If a small country imposes an import surcharge, the likelihood of foreign retaliation is relatively slim because the effect of the surcharge on the rest of the world will be small. But if the country imposing an import surcharge is large, it is almost certain that the surcharge will result in a significant loss of economic welfare for the rest of the world. When the big country succeeds in reducing the world price of its imports relative to its exports, it automatically lowers the amount of import goods that other countries can obtain per unit of their export goods. Moreover, the change in prices faced by the rest of the world shifts resources from their low-cost export industries into their high-cost import-competing industries, thereby creating efficiency losses abroad.

Since the major trading partners of a large, tariff-raising country unambiguously suffer losses in economic welfare, they have every motivation to band together to raise their own tariff or nontariff barriers to trade vis-a-vis the large country. The precise effects of this retaliation depend on the height and the type of the trade barriers that are raised, which are almost impossibie to predict. It is possible that the retaliating countries may be able to improve their economic welfare somewhat relative to what they had experienced in the presence of the surcharge alone. It is much less likely, however, that they will be able to raise their welfare back to its initial level before the surcharge was imposed. As for the large

country, it may have been able to improve its economic welfare somewhat by imposing the import surcharge, but, after foreign retaliation, it is almost certain to suffer a net loss in economic welfare relative to the initial, pre-surcharge situation. Hence, even though there is a possibility that the one or the other may enjoy a net gain in economic welfare after retaliation, the most likely outcome is that everybody will be worse off than initially.

The volume of world trade, already depressed by the imposition of a surcharge, will decline further as a consequence of retaliation. Moreover, even though relative prices on world markets may not change much, prices within countries will be changed significantly by higher tariffs. Hence, throughout the world, prices of export goods will be lower and prices of import-competing goods will be higher. As a result, the distributional effects within countries are likely to be more severe, as even more resources within each country are devoted to production of its relatively high-cost goods.

Of course, the possibility exists that retaliation may lead to counter-retaliation, and so on. An outcome of such a trade war will generally be that both the large country and the rest of the world will suffer losses in economic welfare. In fact, if retaliation escalates, the volume of trade between the large country and the rest of the world could dwindle to almost nothing, and the end result could be disastrous for world welfare.

SECTION III: CAPITAL FLOWS AND EMPLOYMENT EFFECTS CONSIDERED

The effects of an import surcharge become very much more complex and difficult to analyze for a modern monetary economy that is subject to international capital flows and underemployment of capital and labor. In this world, effective exchange rates are determined by the forces of demand and supply for national currencies used in international trade, and also for currencies used to conduct international capital transactions. As a result, imposition of an import surcharge may alter the relative prices of internationally traded goods indirectly through exchange-rate movements that are generated by induced capital flows. Moreover, underemployment of labor and physical capital allows for multiplier effects that magnify a policy shock, such as an import surcharge, into higher or lower levels of aggregate real output and disposable income. Thus, imposition of an import surcharge affects international trade not only through changes in relative prices but through changes in the economy's total output.

Given the great complexity of the situation, the following analysis focuses on a base case under a number of simplifying assumptions that allow unhindered examination of the efficiency costs of an import surcharge. It assumes that the major trading partners of the United States do not band together to retaliate against an import surcharge by raising their own tariff or nontariff barriers to trade. It further assumes that no country undertakes to control international capital flows or to tax international flows of investment income, and that nobody expects such developments.

In addition, the base case assumes that private markets expect a U.S. import surcharge to be permanent, despite official disclaimers to that effect. Consequently, the domestic private sector is willing to undergo adjustment costs associated with the reallocation of real resources among domestic industries. Similarly, foreigners who might engage in direct investment in the United States expect the tariff wall to protect U.S. markets permanently.

Imposition of a U.S. import surcharge raises the domestic price of imports, with two major direct effects on the domestic private economy. One is an expenditure-switching effect in response to change in relative prices, whereby domestic residents switch their spending from imports to domestic output. This would have an expansionary effect on the economy. The other is a contractionary fiscal-policy effect whereby the increase in tariff revenues immediately removes purchasing power from the domestic expenditure stream. In other words, the expansionary expenditure-switching effect is offset to some degree by a contractionary fiscal-policy effect.

If imports consisted entirely of goods that were very similar in all respects (except price) to domestically produced goods, it is quite possible that the expenditure-switching effect could overwhelm the contractionary fiscal-policy effect, and domestic output could rise substantially. At an opposite extreme, in a developing country where the range of possibilities for substitution between domestic output and imports is very limited or nil, the outcome would be very different. In fact, if imports provided necessary

inputs to the domestic production process, domestic output would not only fall in response to a surcharge but could fall by more than the amount indicated by the contractionary fiscal-policy effect.

The truth for the United States undoubtedly lies somewhere between these two extremes. This particular question is an empirical one, left for the quantitative analysis. A study by Data Resources, Inc., suggests that the impact would be contractionary on balance. The next phase of this study will provide a detailed analysis and critique of the DRI study. The present qualitative analysis assumes that, before foreign feedback effects are taken into account, domestic expenditure switching would just offset the contractionary fiscal-policy effect, leaving domestic aggregate demand and real GNP unchanged. These assumptions are adopted solely for analytical convenience in isolating the direct efficiency costs created by an import surcharge. Alternatively, it could be assumed that monetary policy precisely offsets any net expansionary or contractionary effect that occurs. This might be appropriate if the monetary authorities pursue explicit goals for aggregate economic activity. In practice, however, such fine tuning is very difficult, and economic goals are constantly shifting in response to exogenous events and to changes in the structure of the economy.

Other effects of an import surcharge appear to be less ambiguous. Regardless of the direction of the effects on domestic aggregate demand and real GNP, an import surcharge reduces foreign real GNP, lowers the federal deficit, and improves the real U.S. trade balance. Since the

surcharge lowers the world market price of imports, it also improves the nominal U.S. trade balance. Because the trade balance would improve at a constant exchange rate, then it follows that with no change in capital flows the dollar would appreciate.

It also appears that an import surcharge might improve the overall strength of the U.S. economy relative to the overall strength of the rest-of-the-world economy. If it lowered U.S. real GNP, moreover, the surcharge would be likely to lower foreign real GNP by more. 2/ It is quite possible, then, that an import surcharge could strengthen investment capital flows into the United States and thus lead to an even stronger dollar than the improvement in the trade balance alone would produce.

For the following analysis, however, a less extreme assumption is used: the total level of investment capital inflows into the United States is unaffected by the import surcharge and remains the same as in the absence of the surcharge. In this scenario, the effective exchange rate is determined by the strength of excess demand for dollars arising from investment considerations, relative to the strength of excess supply of dollars related to the current-account deficit. By assumption, excess demand for dollars arising from investment considerations is unchanged by

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2. In this case, the outcome in relative terms is less clear; even though the drop in foreign real GNP is likely to be larger than the drop in U.S. real GNP, the percentage decline in U.S. real GNP could exceed the percentage decline in foreign real GNP.

the surcharge. Because the surcharge improves the trade balance at a constant exchange rate, excess supply of dollars related to the current-account deficit declines at the initial exchange rate. Thus, demand exceeds supply, and the dollar must appreciate in order to equilibrate the exchange markets.

One of the motivations underlying proposals for an import surcharge is to ameliorate the effects of what many observers consider to be an overvalued dollar. But if net capital inflows remain strong, it follows that such an import surcharge would be partially self-defeating. Although the relative position of U.S. import-competing industries would still probably improve, exporters would be in worse straits than before, because: (1) the dollar would be stronger; (2) foreign real incomes would be lower; and (3) the U.S. price level would be higher. In fact, a good deal of the favorable impact of a surcharge on the U.S. trade balance could be offset by ensuing dollar appreciation and lower foreign income.

It is very unlikely that this basic result would be altered by allowing autonomous capital flows to change in response to the import surcharge. It has already been noted that the deterioration of foreign incomes would make the United States a relatively attractive place for investment. In addition, a tariff, thought to be permanent, would induce foreigners to establish U.S. plants in an effort to leap over the tariff barrier. While such investments could be financed in U.S. capital markets, it is more likely that some funds would be brought in from abroad. Thus, while it is possible to

concoct circumstances in which the tariff might inspire U.S. capital outflow, 3/ an enhanced capital inflow seems much more likely. This would add to the appreciation of the dollar, causing the surcharge-induced improvement in the trade balance to be reduced further; indeed, it is possible to imagine cases in which the autonomous inflow of capital increases significantly and, at least temporarily, leaves the trade balance worse off than before the surcharge.

The strength of foreign feedback effects suggests that even though domestic expenditure switching might otherwise offset contractionary fiscal-policy effects on the domestic economy, an import surcharge could lower U.S. real GNP indirectly through its effects on the rest of the world. The base-case scenario might require stimulative monetary policy to achieve the outcome of no change in domestic aggregate demand and no change in U.S. real GNP. If so, it is additionally assumed that all domestic prices increase proportionately in response to the monetary stimulus, so that relative price movements are dictated solely by the import surcharge.

U.S. imports tend to be capital intensive, whereas U.S. exports tend to be labor intensive. More specifically, U.S. exports tend to be skilled-labor intensive. In the base case, an import surcharge results in the transfer of

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3. Some U.S. producers who are highly dependent on imports as inputs might be inspired to move their facilities abroad in order to avoid the higher costs imposed by the tariff, but this impact would be unlikely to dominate.

real resources from U.S. industries characterized by comparative cost advantages to less-efficient import-competing U.S. industries characterized by comparative cost disadvantages. Thus, the wage rate of skilled labor falls relative to the wage rate of unskilled labor, and relative to the rental price of capital. The loss of economic efficiency resulting from a suboptimal allocation of domestic resources is mitigated to the extent that capital movements substitute for trade, because net capital inflows alleviate the relative domestic scarcity of capital. Nonetheless, capital inflows cannot eliminate the loss of economic efficiency as long as distortions exist between internal and external relative prices.

Under the base-case assumptions that there is no retaliation and no change in aggregate demand, the main impact of an import surcharge would be on the composition of production and final demand. As stated earlier, some industries, particularly those that compete with imports, would gain as a result of the protective tariff. But others would lose because they rely on foreign inputs, and, therefore, would experience higher production costs. Consumers, of course, would also lose, from higher costs of both imported and domestic products.

Identifying those industries that would expand or contract in response to a surcharge is (under the base-case assumptions) essentially a matter of identifying the effects of higher import prices as the tariff is passed through, and as buyers rearrange their purchases. Higher import prices will generally induce domestic purchasers to substitute like domestic goods for

imported ones, where they can, or to switch to other goods where possible. At the same time, where substitution is not possible, purchasers will simply have to pay the higher cost, either through drawing on savings (discussed in Section IV, below) or through eliminating other purchases.

Winning and losing industries can be identified with the aid of input-output analysis, which allows one to trace the effects of changes in the prices of imported goods and their domestic substitutes through the economy--both in terms of inputs to final products and of outputs of final products themselves. This type of analysis would show how the composition of domestic output and consumption is likely to be affected by the imposition of a surcharge. Without that analysis, it is not obvious which industries would be the winners and which the losers. Certainly, domestic mineral producers would benefit from the higher prices of foreign competitors, but users of those minerals would face higher costs and would thus be injured. The next phase of this study will attempt to identify the winning and losing sectors of the economy with more precision.

Although the base case assumes no foreign retaliation, which precludes any major direct negative effect on U.S. exports, some negative effects could be expected as U.S. producers, including producers of export goods, faced higher production costs. Should other countries choose to retaliate against the United States in kind, domestic compositional effects could be even more pronounced as some key exporting industries, such as agriculture

and aircraft, would have to bear the brunt of reduced foreign demand for their products.

SECTION IV: IMPLICATIONS OF MAKING THE TARIFF TRULY TEMPORARY

The foregoing analysis has assumed that private economic agents expect a U.S. import surcharge to be permanent. The rationale underlying this assumption has its roots in experience; protectionist measures that are instituted on a temporary basis often have a way of becoming rather long-lived, if not permanent. A number of conclusions could change considerably, however, if people making economic decisions believed that a U.S. import surcharge would be only temporary.

One possibility is that U.S. citizens might not change their consumption behavior at all, but would absorb the full impact of the temporary surcharge by dipping into their savings. If real expenditures on imports did not decline, there would be no expenditure-switching effect. There would be no direct contractionary fiscal-policy effect either, because the temporary decline in private savings would fully counteract the loss in purchasing power from the withdrawal of tariff revenues from the domestic expenditure stream.

On the other hand, because temporary depletion of savings implies little or no change in spending on imports, a surcharge will reduce the federal deficit more since tariff revenues remain at a high level as long as the import surcharge stays in place. The greater reduction in the federal

deficit, which is not expected to be permanent, is unlikely to have any significant effect on real interest rates, however, because it will be exactly offset by a fall in private saving. Prices will rise to the consumer by an amount equal to the surcharge. Moreover, given that there is no change in import spending behavior, the external deficit will not improve.

This is not the only possible outcome, of course, because not all U.S. citizens may be willing to sustain higher spending on imports. Although many may want to maintain their import spending in real terms on a temporary basis, including manufacturers who use imported inputs in their production processes, many others may simply postpone purchases from abroad.

To take an extreme example, if the majority of importers postpone their import purchases until the surcharge is lifted, and if simultaneously U.S. citizens conclude that American goods are unacceptable substitutes for import goods, a number of conclusions change dramatically. The U.S. trade balance and current account balance improve sharply. There is no expenditure-switching effect because of the unacceptability of American substitutes, but there is no direct contractionary fiscal-policy effect either because postponed import spending yields no tariff revenues. Nonetheless, the rise in the private-saving ratio lowers domestic interest rates somewhat, and this indirectly raises U.S. real GNP. As a result, there is some improvement in the federal deficit.

In the latter case, the impact on U.S. real GNP is positive, though possibly not large. This suggests the possibility that U.S. net capital inflows

might be stimulated. Other forces, however, work to further confuse the issue. If private markets expect a U.S. import surcharge to be truly temporary, foreigners who might engage in direct investment in the United States would know that there would be no permanent tariff wall to protect U.S. markets in the future. Thus, they would have no incentive to accelerate the pace of their investing in U.S. facilities. In this event, a surcharge-induced increase in capital inflows would be much less likely, and the dollar would appreciate less or possibly even decline.

SECTION V. IMPLICATIONS OF RETALIATION

If an import surcharge was perceived as being relatively permanent or if U.S. citizens were to postpone their import expenditures on a grand scale, qualitative analysis indicates that a U.S. import surcharge would reduce foreign real GNP significantly. In fact, even in cases where U.S. real GNP declines, the decline in foreign real GNP would likely be even greater. The major trading partners of the United States could respond with more stimulative monetary and fiscal policies of their own, but a more direct and a more probable response would be to raise their own tariff or nontariff barriers to U.S. exports.

History demonstrates the plausibility of a retaliatory tariff scenario. When the United States passed the Smoot-Hawley Tariff Act of 1930, many foreign countries imposed substantial tariffs of their own. Smoot-Hawley raised tariff levels on dutiable imported goods to an average

level of 53 percent in 1932, an increase of 33 percent over 1929 levels. Retaliation led to a downward spiral in international trade--U.S. exports fell from 5 percent of GNP in 1929 to 2.8 percent in 1932. In fact, collected duties fell by over 50 percent between 1929 and 1932, as both the volume and value of imports declined.

In the postwar period, a 10 percent ad valorem surcharge was imposed in 1971 as part of President Nixon's "New Economic Policy"--a multifaceted attempt to improve the foreign trade position of the United States. (It included, among other things, abandoning the fixed exchange-rate system and imposing wage and price controls.) The surcharge covered all dutiable imports and was used primarily as a bargaining chip to induce other countries to revalue their currencies. With some exceptions, the effective rate of the surcharge was about 4.8 percent. Foreign reaction to the surcharge was hostile, but the legal situation was ambiguous. A working party of the General Agreement on Tariffs and Trade (GATT) found that the surcharge was in line with the magnitude of the U.S. trade deficit problem, but was inappropriate under the GATT. The working party urged the United States to remove the surcharge within "a short time," but stopped short of calling for sanctions. It was removed within four months of its promulgation, after the Smithsonian Agreement of 1971, and any threats of retaliation evaporated.

Although the likelihood of foreign retaliation against an import surcharge is high, experience shows that its type and extent are virtually

impossible to predict. One may assume that the retaliating country or bloc of countries would raise its own trade barriers to U.S. exports by an amount that would result in a percentage reduction of U.S. exports equal to the percentage reduction in its own exports. Given this or other similarly arbitrary rules of behavior, the mechanics of a retaliatory commercial policy scenario would be relatively simple to handle--if one ignored the effects on capital flows.

If exchange rates are held constant, which is a reasonable approximation in this case, a qualitative analysis suggests that, at each step of the retaliatory process, a country or world region raising its trade barriers may either raise or lower its own real GNP somewhat, but the reduction in foreign real GNP is likely to be greater. Consequently, depending on how many retaliatory rounds are allowed, the reduction in world trade and world real GNP may be substantial. If retaliation accumulates and gets out of hand, there is a danger of serious worldwide economic decline.

Unfortunately, when capital flows are considered, the direction of exchange-rate movements in a retaliatory commercial policy scenario becomes extremely difficult to predict. Capital flows could go either way, depending on expectations of the final outcome of the retaliatory process. Moreover, in such a belligerent atmosphere, it is quite likely that capital flows would be made subject to punitive taxation.

It is possible, then, that a confluence of capital controls, taxes on international flows of investment income, and universally heightened risk

could result in a substantial reduction in the volume of international capital flows. In this event, U.S. interest rates could rise significantly, output and incomes would fall, and the federal debt could explode. High dollar interest rates and a contraction of world trade could result in acute financial problems for Third World debtors and for their U.S. creditors, mostly banks unable to collect their loans.

ATTACHMENT B. A REVIEW OF THE DRI IMPORT SURCHARGE STUDY

This report examines the likely robustness of a recent study by Data Resources, Inc. (DRI) of the macroeconomic impacts of a temporary uniform tariff increase. 1/ The DRI results suggest that if social planners are prepared to incur modest near-term costs implied by depressed activity over the duration of the surcharge, longer-run benefits in the form of a permanently lower debt/output ratio, and generally higher real activity, may be possible. Furthermore, DRI argues, "(in) comparison with other deficit-reduction efforts that also have an impact on inflation,..., a tariff looks relatively good because it shifts some of the burden of closing the deficit to foreigners." 2/

As with all model-based policy assessments, certain assumptions were made by DRI regarding the nature of the policy itself. The DRI study is very clear about these assumptions. Because the study reports simulation results for only one set of conditioning assumptions, however, it leaves open the question of robustness; that is, how likely is the adoption of an alternative set of conditioning factors to lead to alternative sets of point estimates that cast the policy's impact in a radically different light? This is the central question. To address this issue, CBO first discusses the DRI

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1. C. Caton, "The Effects of a Temporary Import Tariff," DRI Review of the U.S. Economy (March 1985) pp. 13-20.

2. Ibid., p. 20. Emphasis is DRI's.

results and delineate the enabling assumptions employed. This discussion appears in the first section below. In the second section on Elements of the DRI Model Structure, some relevant characteristics of the DRI model are examined as a check for potential biases in the model's parameterization. Since no systematic biases are identified, and since this second section is rather technical, the reader can skip that section without any loss in continuity. In the third section, the likely effects of changes in assumptions are explored. A final section summarizes CBO's conclusions.

One point is critical to note at the outset. The quantitative elements of the following discussion derive solely from the study itself, published DRI model documentation, and a methodological briefing by DRI staff members held in early March. Sensitivity tests of the DRI experiment are beyond the scope of the present endeavor. Thus, the discussion does not reflect any simulation results undertaken by CBO. The limitations implied by this fact are clear.

THE DRI RESULTS

The DRI study examines the impacts of a three-year phased-out surcharge on all imported goods. The temporary surtax is assumed to begin in 1986 with a 20 percent increase in tariff rates, followed by a 15 percent levy in 1987 and 7 percent in 1988. The policy change is introduced into a "no policy" baseline environment. DRI constructs this baseline by removing

from their standard (control) forecast any federal policy changes they may be forecasting. In essence, the "no policy" baseline is DRI's analogue to the current service projection of OMB or to CBO's baseline economic projection. The baseline forecast shows real interest rates, exchange rates, and federal deficits to be relatively high by historical standards. 3/ This is not to say that the forecast is remarkably different from the current consensus (which it clearly is not) but only to emphasize that these "initial conditions" are important. To the extent that large deficits and "cautious monetary policy" lead to high interest rates (as the study states), the relative movements in economic variables induced by a new fiscal-monetary policy mix will not typically be independent of the initial conditions.

The simulation work proceeds on the basis of four assumptions:

(1) The surcharge is applied to all imported goods without exemption (uniformity);

(2) Foreign producers "absorb" 50 percent of the surcharge in the form of reduced supply prices;

(3) No foreign retaliation takes place;

(4) The domestic monetary authority responds to the policy with an initial (passive) accommodation and a subsequent (active) expansion in the money supply.

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3. Ibid., pp. 14-16.

The initial effects of the surtax include an increase in the price level (via direct increases in the price of imported goods for final use and in the costs of production for domestic producers using imported inputs), along with a reduction in the federal deficit (increased customs revenues), and an improvement in the current account (increased import prices discouraging import demand, in conjunction with lower external prices for imports). The induced decline in real income leads to a 0.4 percent decline in total real demand. Reduced imports offset about half of this, so that real GNP declines by 0.2 percent in the first year. 4/

A major advantage of using an econometric model for policy analysis is that, when appropriately specified, the model can account for complicated feedback influences throughout the economy. In the present context, these influences are significant. For example, while income-induced declines in real consumption (-0.6 percent) dominate the first-year fall in real GNP (-0.2 percent), the decline in overall activity begins to inhibit investment spending by the second year. Export activity is also reduced by the second year, the result of a decline in foreign real activity as well as a dollar appreciation consistent with improvement in the current account (current account improvement, eeteris paribus, implies a relative increase in the demand for dollar-denominated assets). Thus, even though

4. In the next section, the direct links between the tariff and the macroeconomy in the DRI model will be discussed in greater detail.

the surcharge is phased out after the first year, the adverse consequences for domestic activity linger on, with most of the indicators reported by DRI showing their largest declines in 1988, the final year of the surcharge. In that year, DRI finds real GNP to be down 1.1 percent relative to its baseline level, and the unemployment rate is at its relative maximum, up 0.4 points from baseline--all of which represent relatively small movements.

Once the surcharge is removed, however, this prognosis is decidedly reversed. To quote from the study:

> "In the years 1989-92, the legacy of the tariff persists. Both inflation and the size of the public debt are reduced. As a result, short-term rates begin to come down, the exchange rate depreciates relative to the baseline, and real activity begins to move back towards the baseline." 5/

Indeed, by 1992, the simulation results indicate the policy has achieved a cumulative federal deficit reduction of $210 billion; a cumulative improvement in the current account balance of $156 billion; declines in real interest rates, the price level, and unemployment; and increased real activity relative to baseline.

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5. Ibid., p. 18.

ELEMENTS OF THE DRI MODEL STRUCTURE

Does the specification and parameterization of the DRI model impart any biases to the range of possible simulation outcomes? In addressing this issue, CBO has examined the two sectors of the model most relevant to the analysis of tariff policy: foreign trade and the price level. 6/

Merchandise Trade Flows

DRI distinguishes seven categories of merchandise imports and six categories of exported goods. The classifications are by end-use, and the data underlying the estimated equations are the 1967 benchmark Census series (Series 990). The model calculates real demands and prices using behavioral specifications so that nominal flows are determined by indentities. Service flows are included in the model but are not discussed here.

The real flow demands follow a fairly common specification with the exception of fuel imports, which are discussed below. The typical import

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6. The overall structure of the DRI model is examined in great detail in Otto Eckstein, The DRI Model of the U.S. Economy (McGraw Hill, 1983). The version of the model used in the surcharge study is described in Otto Eckstein et al., "Properties of the 1983-A Version of the DRI Macro Model," DRI Review of the U.S. Economy (April 1983), pp. 1.13-1.18. As of this writing, DRI is preparing to release an updated version of their model. Therefore, many of the specific points made here regarding the model's properties may not apply to the new version.

specification relates real import demand to a real domestic final demand term and a relative price term (import price relative to the domestic wholesale price of the competing good). A typical real export equation relates the real flow to a weighted average of measures of real foreign economic activity (production measures, to be described below) and a relative price term (the dollar price of the exported good relative to the converted world wholesale price level). All equations are of the constant elasticity variety, and the right-hand side variables are all entered as distributed lags of varying length.

Table 1 contains a listing of the trade flow elasticities with respect to real activity and price. For each end-use category (excluding fuel imports), the table lists elasticities and lag lengths (in quarters). Note that for several import categories, income elasticities are unitary. In each of these cases, this is the result of a coefficent restriction imposed a priori.

In the case of automotive imports, the specification is atypical since price terms are not present (presumably because of the existence of quantity rationing), and the demand elasticity is restricted to be unitary. To estimate an equation for auto imports, DRI regresses real auto imports relative to real domestic auto consumption against a cyclical variable--consumer sentiment. An elasticity of -0.5 is obtained.

TABLE 1. REAL MERCHANDISE TRADE FLOW ELASTICITIES

End-Use Category	Real Activity: Short run	Real Activity: Long run	Lag Length	Price: Short run	Price: Long run	Lag Length	1983 Share (%) [a/]
Imports							
Food	0.519	1.298	4	-0.048	-0.447	6	9.1
Materials (nonfuel)	0.558	1.394	4	-0.101	-0.946	6	22.0
Capital goods	1.000	1.000	0	-0.121	-0.302	4	22.6
Automotive	1.000	1.000	0	-	-	-	13.3
Consumer goods	1.000	1.000	0	-0.078	-0.731	6	22.8
Other goods	0.514	1.284	4	-0.137	-1.280	6	3.1
Exports							
Food	0.233	0.581	4	-0.111	-0.554	4	11.1
Materials (nonfuel)	0.330	0.824	4	-0.050	-0.469	6	28.3
Capital goods	0.532	1.330	4	-0.119	-1.107	6	28.8
Automotive	0.468	1.171	4	-0.079	-0.736	6	7.0
Consumer goods	0.397	0.992	4	-0.206	-1.636	6	9.0
Other goods	0.370	0.925	4	-0.074	-0.692	6	7.9

SOURCE: Congressional Budget Office calculations based on data from Data Resources, Inc., Macro Model of the U.S. Economy; Version US83A Equation (March 1983).

a/ Percentage distribution of merchandise trade flows across end-use types. Fuel imports have been excluded from the detail but not the total.

The import and export unit value indices--free alongside ship (f.a.s.) and, hence, pre-tariff)--are also endogenously forecast in the DRI model. The typical import price equation relates the rate of change in the unit value index to a distributed lag on the rate of change of the converted foreign producer price. (Again, the specifications are of the constant elasticity variety.) The foreign price level employed in the right-hand side is the same across end-use import types. In the case of exports, the sectoral specifications are consistent with a constant mark-up pricing scheme by domestic exporters. Specifically, the rate of change in an export unit value index is regressed against a distributed lag on the rate of change in the domestic producer price for the same type of good.

For reference purposes, Table 2 displays the estimated inflation elasticities. In some instances, these elasticities are only partial elasticities, since in several cases DRI adds cyclical variables (for example, vendor performance) that are price sensitive.

Regarding fuel imports, the model's structure is somewhat different. Real fuel import demand (1967 dollars) is related to a physical measure of energy imports (BTUs). This physical measure of energy imports is, in turn, related to both real activity and the price of imported oil, although in a complicated way. The foreign oil price in the DRI model is represented by an acquisition cost concept (post-tariff).

TABLE 2. IMPORT PRICE INFLATION ELASTICITIES

End-Use Category	Short run	Long run	Lag Length (Quarters)
Imports			
Food	0.496	0.992	2
Materials (nonfuel)	0.457	0.913	2
Capital goods	0.295	0.998	2
Automotive	0.450	0.997	3
Consumer goods	0.269	0.997	3
Exports			
Food	0.685	1.027	1
Materials (nonfuel)	0.539	1.079	2
Capital goods	0.008	0.985	3
Automotive	0.485	0.970	2
Consumer goods	0.061	1.098	2

SOURCE: Congressional Budget Office calculations based on data from Data Resources, Inc., Macro Model of the U.S. Economy: Version US83A Equation (March 1983).

The determination of merchandise trade flows is completed by the specification of equations for the foreign economic indicators (foreign producer price index and real production indices for Canada, Japan, and OECD Europe) and the exchange rate. The rate of change in each of the foreign economic indicators is regressed against relative movements in analogous indicators for the United States. In the case of the foreign producer price, a weighted average of various domestic producer prices is used as the domestic analogue. These specifications seem designed to capture the importance of the United States in world trade to the extent that cyclical variations in the domestic economy will be transmitted abroad.

The DRI exchange rate is a trade-weighted index (May 1970 = 1.0) published by Morgan Guaranty Trust. The exchange rate equation represents an attempt to incorporate both current and capital account influences. Full stock/flow interactions are not present, however. The current account influences are introduced by relating the relative change in the exchange rate to the oil-adjusted nominal trade balance relative to GNP (assuming 50 percent of fuel import transactions are dollar-denominated) over the preceding four quarters. Capital account influences are accommodated by a partial interest-parity mechanism in which both the change and level of the 90-day Treasury bill rate are included as determinants of movement in the U.S. dollar rate. Since interest-parity relies on international capital flows to equilibrate (risk-adjusted) international interest-rate differentials, and since foreign interest rates are not present in the DRI model, the parity mechanism is only partially specified. As with the foreign economic indicators mentioned earlier, some appeal must be made to the size of the U.S. position in world transactions in order to justify this specification.

With this outline of the DRI trade sector in mind, the immediate impacts of the surcharge are easily traced out. The surcharge raises import unit value indices by the effective rate of tariff increase (that is, the surcharge rate times one minus the absorption rate), resulting in a direct decline in real import demand. To the extent that real incomes are reduced, several of the income proxies also decline resulting in further declines in import demand. Since, in the DRI study, interest rates move up only

marginally owing to the price-induced increase in money demand, current account influences dominate in the near term, placing upward pressure on the exchange rate. Foreign production activity reacts to depressed U.S. production with a lag so that the combined impact of dollar appreciation and declining demand overseas lowers U.S. exports in a delayed fashion. Real exports show significant decline (-1.7 percent) by the second year of the surcharge.

Does this specification of trade flows significantly bias the results? It is possible to question a number of the DRI specifications (as it is possible to do in virtually every model). For example, it was noted above that many of the income elasticities of import demand are constrained to unity. In a recent survey of empirical literature, Goldstein and Khan report that all but one of the studies surveyed indicate long-run income elasticities of total U.S. import demand well in excess of the (nonfuel) average of 1.06 implied in Table 1. 7/ This implies that the DRI specification may have underestimated the import decline. Moreover, the specification of foreign real activity may equally well have understated the declines in foreign production activity since they rely only on the transmission of income effects from the U.S. The assumption of foreign absorption, in particular, may imply declines in these foreign variables beyond what the model

7. M. Goldstein and M.S. Khan, "Income and Price Effects in Foreign Trade," Chapter 20 in R.W. Jones and P.B. Kenen, Handbook of International Economics, vol. 2 (North-Holland, 1985).

specifications would indicate. (Movements in relative prices that apply to U.S. trade could also affect foreign real activity through other channels.) If this were the case, it could be argued that the model may also have underestimated the depressing effects of the surcharge on U.S. exports. Any bias in the current account balance is thus indeterminate without further empirical investigation.

Determination of the Price Level

Price determination in the DRI model is influenced by a combination of cost-push and demand-pull factors. Since the cost-push elements are of primary relevance in the present context, demand-side influences can be dealt with very briefly. Two related but distinct demand measures used in the DRI price equations are the unemployment rate and alternative indicators of slack demand (either the Federal Reserve Board capacity utilization measure or delivery lags). The unemployment rate--determined by a variant of Okun's Law--enters the wage rate equation with a Phillips curve structure. Prices, in general, can be viewed as a variable mark-up over expected unit costs, with the mark-up factor a function of the slackness of demand. Although demand-side influences will be important, the direct price effect of the surcharge will be dominated by passthrough on the cost side.

The unit value indices for imports--described earlier--affect prices via two routes. First, several of these prices enter the wholesale price

block (primarily import prices for materials, capital goods, and fuel). Second, some of the import value indices enter the equations for several final demand deflators directly (for example, automotive consumption and equipment investment). In almost every instance, import prices enter as one element in an aggregate materials term with a factor usage weight applied to the various import prices. In the wholesale price block, these weights derive from an input/output (I/O) structure, while in the case of final demand deflators, individual import prices may be weighted by demand mix terms. In addition, the material cost terms are entered on the right-hand side of the respective price equations with a distributed lag.

Generally, the producer price mark-up structure implies a production structure with substitution (at constant rates) between aggregate material and labor inputs and allocations among the disaggregate material inputs (including imported goods) following a fixed proportions framework. This separability assumption implied for the sectoral production technology is consistent with the following two-stage allocation sequence. On the first round, producers allocate labor and total materials using a constant elasticity technology. Once total materials usage has been determined, a second round allocation is made, whereby total demand for materials is distributed across detailed material inputs according to a fixed proportions rule (that is, an I/O table column).

Thus, the passthrough of an import price shock to the overall price level depends on the following:

(a) The direct impacts on producer prices (and selected deflators);

(b) The ultimate passthrough from producer prices to the overall price level including indirect cost and demand effects.

An examination of the model's equation coefficients is instructive only in discussing (a). The effect in (b) is obviously dependent on model simulation (as well as equation) properties and will not be discussed further here.

Given the above discussion, it should be clear that the direct determinants of import price passthrough will depend on both the elasticity of price with respect to material costs as well as the I/O weight on the relevant import category used in the calculation of aggregate sectoral materials demand. These parameters are displayed in Table 3. In interpreting the parameter estimates in Table 3, several points are worth emphasizing. First, the estimates are helpful only in comparing the relative direct impacts of changes in import prices. The reason is, of course, that the I/O cross-equation links are more pervasive than a single equation specification would imply since the single equation delineates only direct effects. Second, in several instances input prices enter into the producer price equations separately and without weights (for example, metals). In the context

TABLE 3. . DIRECT MATERIAL COST INFLATION PASSTHROUGH ELASTICITIES

	Short Run	Long Run	Lag Length	I/O Import Weight
Food, Feeds, and Beverage Imports				
WPI, Processed Food	0.807	1.211	1	0.049
Nonfuel Material Imports				
WPI, Textiles & Apparel	0.418	0.627	1	0.026
WPI, Chemicals	0.272	1.253	2	0.039
WPI, Rubber & Plastics	0.561	0.841	1	0.051
WPI, Lumber & Wood	0.408	0.816	2	0.091
WPI, Pulp & Paper	0.742	1.113	1	0.065
WPI, Metals	0.094	0.161	1	--
WPI, Misc. Industrial	0.658	0.986	1	0.012
Capital Goods Imports:				
WPI, Machinery & Equipment a/	0.011	0.011	1	--
IPD, Investment, PDE ~	0.350	0.893	3	b/
Automotive Imports:				
IPD, Consumption, Auto.	0.004	0.004	0	--
Consumer Goods Imports:				
WPI, Textiles & Apparel	0.418	0.627	1	0.055
WPI, Rubber & Plastics	0.561	0.841	1	0.023
WPI, Miscellaneous Industrial	0.658	0.986	1	0.095
IPD, Consumption, Clothing	0.013	0.371	2	0.093
IPD, Consumption, Furniture	0.440	1.039	3	0.031
IPD, Consumption, Other Durables	0.256	0.508	2	0.074

SOURCE: Congressional Budget Office calculations based on data from Data Resources, Inc., Macro Model of the U.S. Economy; Version US83A Equation (March 1983).

NOTES: I/O = input/output.
WPI = wholesale price index.
IPD = implicit price deflator.
PDE = producers' durable equipment.

a. Only lagged price effect included.
b. Import share of PDE investment is used as a weight.

of the structural framework described above, this type of specification would yield (lower) parameter estimates reflecting the fact that the regression equation is now picking up (and is dominated by) the I/O weight as well as the generic materials effect.

The producer price block has familiar Cobb-Douglass theoretical structure. Unfortunately, given the stated theoretical foundation for this sector, it is impossible to obtain reasonable parameter estimates without the imposition (if not the testing) of parameter restrictions. That such restrictions were not imposed by DRI is evident from the uniformly high long-run elasticities in Table 3 (in the long run, these elasticities should equal the materials share). Thus, while these producer price equations may have good forecasting properties, the passthrough implications appear to be unreasonably large.

Conclusions based on this observation may be hasty. One reason to suspect that the aforementioned upward bias may not be the whole story is that the I/O weights used by DRI in constructing the aggregate materials cost terms are dated. Benchmark I/O tables are published by the Bureau of Economic Analysis (BEA) only in economic census years (every five years). Although it is possible to "update" I/O tables to any year for which a comprehensive set of industry data is available, the derived coefficients are often inextricably linked to the benchmark data. The DRI I/O weights are based on a 1977 update of the 1972 BEA benchmark I/O tables (the most

recent data available to DRI at the time this version of the macro model was compiled). The secular movement of import intensities in final use since 1972 (and 1977) has been unambiguously upward. Thus, the dated I/O weights in the DRI price equations are likely to understate the import content of aggregate materials demand by U.S. industries. This observation together with that made above regarding the materials cost coefficients lead, once again, to the conclusion that the direction of overall bias in this sector is indeterminate.

Thus, the two key sectors of the DRI model do not seem to manifest clear and predictable biases, at least based on this cursory review, that may lead to the "forcing" of a particular range of macroeconomic results. While it is important to point out that no standard model can be expected to be perfectly suited for every conceivable policy application, it is no less important, in evaluating policy experiements performed in such models, to examine the conditional hypothesis imposed by the model itself. In the present context, then, it is appropriate that attention be diverted toward the several other conditioning hypotheses maintained in the DRI study.

THE ROLE OF CONDITIONING FACTORS

While the DRI assumptions are not necessarily implausible, it is important to understand how sensitive the reported DRI results are to changes in these assumptions. The purpose of this section is to further qualify the DRI results. As demonstrated below, changing the policy itself to a flat rate of

20 percent (that is, no phase-out) and relaxing assumptions (1) through (4) would almost certainly increase the short-run costs of the policy. In addition, CBO's analysis suggests that the long-run economic prospects are dramatically influenced by the assumption of an active expansion of the money supply by the Federal Reserve. Thus, under a no-less-plausible set of assumptions, the DRI model could easily produce simulation results that are counter to those reported by DRI: more costly adverse effects in the near-term as well as a much less rapid return to growth in the long run, at the very least.

Sensitivity of the Short-Run Results

As briefly described in the first section and documented more fully in the DRI study, the initial adverse effects of the phased out surcharge are the induced real income loss and an associated decline in consumption expenditure that more than offsets the decline in import demands. Even as the surcharge rate is reduced, the initial decline in real output leads to reduced activity in sectors that are only indirectly linked to real disposable income (for example, business fixed investment). The first point to be made is an obvious one. That is, if the surcharge were assumed to be imposed at a flat rate of 20 percent (without changing any of the other assumptions), the short-run declines would be more dramatic. While the inflationary impact may still be diminished after the first year, this would be the result of larger induced declines in domestic demand and not on the phase-out rate of the import levy. The peak decline in real GNP would be larger and, based on

the feedback lags implied in the DRI study, might occur well after the surcharge has been removed.

Several other qualifications are noted by DRI. 8/ The near-term declines reported by DRI would necessarily be larger if foreign retaliation were assumed, even though the upward pressure on exchange rates owing to the current account improvement might thus be eliminated. Suppose, for the sake of concreteness, retaliation is immediate and takes the form of import restrictions abroad on U.S.-produced goods that are sufficient to wipe out the U.S. current account gains entirely. Using data from the DRI study, this would imply (in a static sense) further declines in exports averaging $45 billion over 1986-1988, or an average additional decline (others things held equal) of $1.0 billion in nominal GNP. 9/ This direct loss would obviously instigate further losses as a result of feedback.

The appropriate qualifications of the analysis with regard to the assumed uniformity of the levy are noted by DRI. The effects of revising the assumptions, to incorporate nonuniform absorption and selective exemptions from the surtax are impossible to predict from a simple

8. C. Caton, "The Effects of a Temporary Import Tariff," pp. 18-20.

9. Ibid., Table 3, p. 18.

examination of the DRI model equations since they would critically depend on simulated movements in relative prices. The results generated for the aggregate price level could go either way with respect to the DRI simulation. DRI does indicate the possibility of alternative outcomes if uniform exemptions are allowed. 10/

In summary, the short-term results obtained by DRI might be substantially altered if alternative assumptions about the tax phase out and retaliation are included. In addition to increasing the direct negative impacts of the tax, a joint relaxation of these assumptions is likely to produce more long-lasting adverse effects as a result of the nature of the feedback lags in the DRI model. These qualifications have, for the most part, been alluded to by DRI. The DRI study does, in fact, present an interesting rationalization of the absorption hypothesis.

Sensitivity of the Long-Run Results

As was mentioned earlier, the DRI results are relatively sanguine in the sense that the short-run adverse movements are modest and, in the long run, all the macro indicators reported show unambiguous improvement. In the fourth year after removal of the surcharge, real GNP is reported to have risen 1.0 percent above its baseline level.

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10. Ibid., p. 18.

It is impossible (without extending the DRI simulation to cover the years beyond 1992) to separate the permanent and transitory components of the recovery. 11/ DRI does provide a hint, however, in stating that although the current account improvement dissipates once the tax is removed, "the (federal) deficit is permanently improved because interest payments are lower." 12/Indeed, the improvement in activity by 1992 owes much to a 125 basis point decline (from baseline) in short-term interest rates and a 4.3 percent dollar depreciation. While real consumption expenditure in that year has only just re-achieved its baseline level, interest-sensitive sectors exhibit major gains, with real housing and business fixed investment up 6.5 percent and 1.4 percent, respectively. The effects of the dollar depreciation are evidenced by a 2.4 percent rise in real exports and a 1.7 percent decline in real import demand. Thus, it seems apparent that an explanation for the relatively large decline in interest rates and the substantial dollar depreciation (both of which show their largest absolute movements once the surcharge is removed) necessarily precedes an understanding of the favorable long-run picture painted in the DRI study.

11/ Transitory improvements might result from feedback lags that are symmetrical to those accounting for the delayed decline in aggregate activity when the tax is introduced.

12/ Ibid., p. 18.

The argument to be presented here is that the assumed monetary policy is in large part accountable for all these improvements. This conclusion is developed by the following sequence of arguments:

(1) The improvement in short-term rates is mostly the result of the assumed monetary policy;

(2) The dollar depreciation is implied by movements in interest rates and, by (1), is also profoundly influenced by monetary policy.

These arguments are now developed in turn. The DRI model equation for the 90-day Treasury bill rate (the key short-term rate in the model) is specified, generally, as positively related to nominal money demand and real activity, and inversely related to the availability of loanable funds (a variable directly linked to monetary instruments). Thus, the increases in activity would tend to increase the 90-day Treasury bill rate. DRI attributes the decline in rates to the decline in "inflation and the size of the public debt." 13/ The price level is very nearly at its baseline level in 1992, and the inflation rate is slightly higher. As for the role of the reduced deficit, the effects are mild. The interest rate equation is related to the public debt by incorporating (the logarithm of) the real per capita change in

13. Ibid., p. 18.

U.S. government debt held by private investors. To illustrate the magnitudes involved, a $52 billion decline in gross federal debt (corresponding to the amount implied in the DRI study for 1992) was run through the interest rate equation with all other factors held constant. 14/ Using data for the fourth quarter of 1984 as a benchmark, this calculation yields a decline in the 90-day Treasury bill rate of 32 basis points, somewhat less than 30 percent of the decline reported by DRI. 15/ Noting that this decline would at least be partially offset by increased money demand and real activity, the conclusion that the expanded money supply accounted for a major share in the decline in interest rates is inevitable.

Evidence for the exchange rate dependence on the monetary policy is also present. As was mentioned in the section on Elements of the DRI Model Structure, the DRI exchange rate equation incorporates capital account influences by including the 90-day Treasury bill rate on the right-hand side. Because the 1992 DRI results show a current account improvement, the 4.3 percent depreciation of the dollar must be the result of the interest parity mechanism.

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14. That is, assuming money supply to be constant and also abstracting from the increased real activity that would lead to increases in this rate.

15. The use of a historical benchmark overstates the proportional decline in privately held debt leading to the possibility that the interest rate impact reported in the text is an upper bound on this partial effect.

Having made the case for arguments (1) and (2), it still must be shown that the movements in interest rates induced by monetary policy are effective in stimulating demand. While the composition of the long-run recovery shown in the DRI results alone attests to this, it is possible to show that the implied characteristics of the DRI model support this effect in general. In a 1983 test of the version of the model used in the study under review here, DRI shows that a sustained exogenous real shock to the model, accompanied by a monetary policy that keeps the supply of money at its baseline level, produces considerably different macro results than if monetary policy had been unchanged and the money supply had been allowed to fluctuate commensurate with demand. 16/ In their 1983 study, DRI finds the size of the real multiplier, after sixteen quarters of sustained shock with the money supply held at its baseline level, to range between 10 percent and 36 percent of the multiplier to be obtained if the Federal Reserve is assumed to play a passive role throughout and to allow the money supply to fluctuate endogenously.

These results are instructive in the present context. The DRI surcharge study assumes the Federal Reserve will react with a lag, allowing the money supply to grow endogenously with the increase in inflation early on. The Federal Reserve will expand supply only after the economy has

16. Otto Eckstein et al., "Properties of the 1983-A Version of the DRI Macro Model," Table 3, p. 1.15.

shown weakness. The result is that the money supply rule is considerably more expansive than even DRI claims in terms of money growth. The money stock is nearest its baseline level in 1990 and exceeds the baseline value by a large 0.6 percent in the final year of the simulation. The extent to which the power of monetary policy in the model is considerable (as evidenced by the multiplier study) hints at the possibility that an alternative, less expansionary monetary policy could well nullify (if not more than offset) the long-run economic gains as both interest rates and the exchange rate would be unambiguously higher.

CONCLUSION

It is obviously desirable to buttress any qualitative policy assessment with quantitative analysis. A necessary precursor to any quantitative economic policy assessment is an economic model. Because no single model can ever be a complete characterization of the economic environment, a choice of models in practice involves the selection of a quantitative framework possessing sufficient flexibility to produce results of interest to the policymaker, along with the selection of several alternative hypotheses that the model incorporates as exogenous determinants. The quantitative results produced by simulating the model are conditional on the chosen exogenous factors. To be useful in the policy assessment, however, the model-based results must be robust in the sense that the influence of conditioning factors (about which the chosen model has little to say) is minimized.

Typically, a model is simulated many times, each time incorporating another of the alternative hypotheses. The collection of model results obtained in this fashion is then analyzed by evaluating the likelihood that each alternative hypothesis is true. The important point is that a quantitative assessment of any policy generated by only one set of conditioning factors is necessarily incomplete. The inevitable conclusion here is that the DRI study is incomplete in this sense. While it was argued in this review that the DRI model is not necessarily an inflexible tool for the purposes of analyzing surcharge policies, the results are likely to be extremely sensitive to the choice of conditioning factors. Perhaps the most predictable feature of the model is the important and pervasive influence of monetary policy. A no-less-plausible choice of a passive "monetary response could dramatically change the nature of the long-run conclusion reached by DRI.