

THE J-CURVE REVISITED

by Gabriel A. Castillo and Til Schuermann

Editor's Note: *From time to time we publish relatively technical studies that have immediate implications for current events. In the present case the "J-curve," which the University of Chicago economist Stephen P. Magee said describes the expected changes in a country's balance of trade following a depreciation of its currency (i.e., the balance of trade worsens before it gets better), has become a matter of controversy.*

Very simply, since the U.S. dollar began depreciating in foreign-exchange markets in March 1985, the U.S. trade balance has deteriorated as anticipated by J-curve theory. But the expected subsequent improvement – the "ascender" on the J – has not occurred. If the J-curve phenomenon is indeed the "usual" development, then the implication is that some extraordinary circumstance must be keeping the curve from maturing, i.e., the trade balance from improving as quickly and as dramatically as presumed by the theory.

*Recently, the U.S. trade deficit, together with the Federal budget deficit, has been widely cited as a major "cause" of October's stock market collapse. Even before the crash, media and other critics of liberalized trade policy seized on the "J-curve" issue as a means of promoting policies – such as subsidies to target industries and other protectionist measures – that they say will curb the trade deficit. According to their reasoning, the failure of the J-curve to materialize during the latest drop in the dollar's foreign-exchange value is conclusive evidence of "unfair trade practices" and of the need for new punitive measures to "fight the deficit." As the *U.S. News and World Report* observed in a commentary on the J-curve controversy last July: "More is at stake than either letters of the alphabet or the validity of economic theories" – namely, the direction of U.S. trade policy.¹*

Viewed from the perspective of the relationship between the behavioral sciences and public policy, the J-curve controversy provides a classic illustra-

tion of how even very tentative theory can be "mis-read" and used by nonscientists to achieve political ends. As the paper that follows suggests, Professor Magee's initial presentation of the J-curve conjecture was far more complex, and far more qualified, than its subsequent popularizers have been willing to concede.

Messrs. Castillo and Schuermann show that the available data support the notion that, under many circumstances, the J-curve effect influences the trade balance. But it is not the inevitability under "usual" conditions that critics of U.S. trade policy would imply. Rather, the J-curve effect is only one of many factors involved in the foreign trade balance – and may or may not "mature" in any given instance of currency depreciation. In view of their findings, its failure to mature during the current episode of dollar depreciation seems unsurprising. It should scarcely be cited as a reason to impose harsh trade restraints or other measures designed to thwart international market processes.

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I. INTRODUCTION.

That the news media and economists alike have begun doubting the validity of Professor Stephen P. Magee's J-curve hypothesis is obvious.² Magee's thesis holds that, because there is a "lag" in consumers' and producers' existing patterns of spending, the initial effect of a currency devaluation shows up as a deterioration in a country's trade balance. An improvement in the trade balance follows only after a lag – thus, the "J-curve." Magee's theory originally also implied that the initial wors-

ening of the trade balance would last approximately 1 year, a figure he later revised upward to 1-1½ years. A close analysis of discrete short-term changes in the U.S. balance of trade since 1971 might be cited either to support *or* refute the J-curve phenomenon as described and amended by Magee. It has now been over 2 years since the dollar started depreciating against most other currencies of its major trading partners, and an improvement in the trade balance has not yet fully materialized, leading skeptical observers to question the significance of J-curve phenomena. Long-term (or trend) analysis tends to confirm the existence of J-curve effects, but also suggests ways that the J-curve hypothesis might be modified to accommodate periods of exchange-rate volatility that had not been anticipated when it was first conjectured.

Under the system of *fixed* exchange rates prevailing prior to 1974, governments held the discretionary power to weaken the relative value of their currency (with respect to the currencies of major trading partners) in an attempt to raise exports, lower imports, and therefore improve the trade balance. However, since 1974 the United States and its major trading partners have followed a system of *floating* exchange rates in which the dollar's and other currencies' values are determined on a daily basis by market forces reflecting supply of and demand for each currency. As events have turned, the difference between *fixed* and *floating* exchange rates has diverse implications for what the J-curve theory would lead economists to expect about turning points in the trade balance of a given country, a difference that to date has not been offered even lip service.

This paper explores five periods in recent U.S. history that provide an empirical test of the J-curve phenomenon and its possible duration. With respect to the latter, we found significant differences between the early 1970's that Magee observed and the subsequent periods. The most important dissimilarity between the earlier period under fixed exchange rates, which was marked by *occasional devaluations* (usually followed by no further movements of the exchange rate), and the subsequent period under floating exchange rates is that the latter has been characterized by *daily depreciations/appreciations* (usually adhering to a longer-run trend). This difference is crucial, since in each case market expectations are affected in separate ways.

Exporters and importers tend to view occasional devaluations as once-and-for-all adjustments of the exchange rate, and accordingly they adjust contracts, prices, and quantities quickly, resulting in a "short" lag. Consumers, on the other hand, do not immediately realize that the imported goods they

are used to consuming have risen in price relative to the available domestically produced alternatives. Indeed, if producers in the exporting countries choose to "absorb" losses due to exchange-rate movements, imported goods may *not* rise in price relative to domestically produced goods. Only when importers quickly adjust their prices can consumers also be expected to adjust quantities demanded of imported goods. Even under a system of fixed exchange rates, then, a deterioration in a country's trade balance may initially follow a devaluation.

Under the prevailing system of floating exchange rates, there is even greater uncertainty. Exporters and importers can merely speculate about whether a sudden depreciation will be short term or permanent. Consequently, they tend to follow a wait-and-see plan of action and hedge in the exchange markets, postponing price and quantity adjustments until additional depreciations confirm the newly established trend. All other things being equal, the wait for "confirmation" of an exchange-rate trend under the floating rate system generates a longer lag between the start of a devaluation and subsequent improvement in the trade balance than under fixed exchange rates. From a consumer's perspective, demand for imports remains unchanged so long as importers do not "pass through" the higher price of imported items. (For example, until recently Japanese producers elected to absorb most cost differences accruing from the U.S. dollar's drop against the yen.)

Another big difference between what Magee observed in the early 1970's and the developments since then consists of the relatively smaller magnitude of devaluations that he observed. Today's depreciations and appreciations of the dollar have been about twice the magnitude observed earlier by Magee. Finally, very little emphasis has been placed on the role of shocks (such as in the prices of oil and other commodities) in retarding or accelerating the maturation of the J-curve on some expected schedule.

With respect to the latter, this paper suggests the following modifications to existing theoretical analyses of J-curve phenomena:

- 1) When it is observable, the J-curve effect may have different maturations under different exchange-rate regimes.
- 2) Under the system of fixed exchange rates the data suggest that full adjustment to exchange-rate modifications was achieved more rapidly than the 1-1½ year period usually cited.
- 3) A 1-1½ year adjustment period does not apply to the present case of floating exchange rates.

- 4) The duration of adjustment that we have observed under floating exchange rates is significantly longer than both that observed for the period of fixed exchange rates and the 1-1½ year period predicted on the basis of earlier theory – during one period a few months in excess of 2 years.

This paper does not contest Professor Magee's reasoning. Rather, on the basis of observation since it was initially developed, it seeks to extend analysis of J-curve theory to the system of floating exchange rates, and to modify it where required. In this effort, trend analysis is useful where recent and short-term observations do not conform to the expectations of J-curve theory formulated prior to the introduction of floating exchange rates and the advent of extreme short-term fluctuations in the valuations of competing currencies.

II. METHODOLOGY.

The J-curve is roughly composed of three parts: a "currency-contract period," a "pass-through period," and a "quantity adjustment period." Professor Magee has described these periods as follows:³

Currency-contract analysis deals with that brief period immediately following a devaluation (or appreciation [actually a revaluation]) in which contracts negotiated prior to the change fall due. As used here, pass-through analysis refers to the behavior of international prices on contracts agreed upon after the devaluation has taken place but before it has effected significant changes in quantities [*i.e.*, the changes in quantity constitute the "quantity-adjustment period"].

He adds that "The implications frequently drawn from the events following the 1971 devaluation of the dollar are that (1) improvement in the trade balance depends on whether the devaluation affects the real volume of trade, and (2) a trade balance must get worse after a devaluation before it can get better."⁴ Since the devaluation is the supposed cause and the "getting better" (*i.e.*, the quantity-adjustment period or trade-balance improvement) the supposed effect, we test here for the existence and the duration of the "must get worse . . . before."*

At the end of Section III, we consider the possi-

* Professor Magee makes clear that the J-curve effect is not a theoretically inevitable result of currency devaluations, but applies in only a minority of hypothetically possible short-run effects of dollar devaluations on the U.S. trade balance. We consider here only those situations where the J-curve effect would be expected on the basis of his theory.

bility that if the three dollar devaluations of the early 1970's are differentiated, then the evidence would suggest that the duration of the currency-contract and pass-through periods under periodic devaluations may be somewhat shorter than originally implied. The post-1974 experience of daily adjustments under a system of floating exchange rates implies a longer currency-contract and pass-through period.

The main difference between Professor Magee's devaluation and our depreciation analysis lies in the duration of the adjustment period (or pass-through period) immediately following the currency-contract period. As originally suggested in his paper, we assume that the movement of export and import prices 1 quarter after a devaluation (or depreciation) gives an indication of whether a country is a Strong Bargainer (SB) or a Weak Bargainer (WB) in renegotiating contracts. Magee tested for bargaining strength by analyzing export prices (P_x) and import prices (P_m) individually. However, we have employed the ratio of export to import prices called the Terms of Trade ($TOT = P_x/P_m$) as a perhaps less subjective indicator of relative negotiating strength.

Our procedure for labeling a country as a weak or strong bargainer is described as follows. We first identified significant exchange-rate fluctuations. Next we correlated these movements with the terms of trade movement in the subsequent quarter. Finally, we classified the country as demonstrating "definitely" WB (--), "strongly" WB (-), "definitely" SB (++), or "weakly" SB (+) abilities to bargain. This classification structure is illustrated in Table 1.

This method was applied in each of the four sub-periods of analysis. Accordingly, we classified the bargaining strength or weakness of the United States as illustrated in Table 4 (see pp. 9-10).

There is a crucial difference between a devaluation and a depreciation. Because devaluations are considered once and for all, exporters and importers can quickly adjust contracts to more favorable terms for all periods to come. For example, as seen in Table 2, following a currency devaluation, a

Table 1
BARGAINING POWER CLASSIFICATIONS

	<i>Next Period TOT Rise</i>	<i>Next Period TOT Fall</i>
Appreciation or Depreciation	SB ++	WB --
Accelerating or Decelerating Appr. or Depr.	"Weakly" SB +	"Strongly" WB -

Table 2
CURRENCY DENOMINATION OF TRADE UNDER A DEPRECIATION

<i>Bargaining Strength</i>	<i>Denomination</i>	<i>Trade</i>	<i>Prices</i>	<i>Terms of Trade</i>
Strong Bargainer (SB)	fc	Exports ==>	$P_x \uparrow$	TOT \uparrow
	\$	Imports ==>	\bar{P}_m	
Weak Bargainer (WB)	\$	Exports ==>	\bar{P}_x	TOT \downarrow
	fc	Imports ==>	$P_m \uparrow$	

Legend: \$ = dollars; fc = foreign currency; P_x = export prices; P_m = import prices; a bar over P_x or P_m signifies no change; \uparrow indicates increase; \downarrow indicates decrease.

country's exporters during the currency-contract period take capital gains on their exports if they are denominated in a foreign currency (fc) and losses if they are denominated in dollars (\$).⁵ Immediately following the currency-contract period, an SB country would not set most of its exports in fc, which would be equivalent to a higher price for its exports. Imports, however, remain denominated in \$ so that their price remains constant. These results imply that a country experiencing increased terms of trade 1 quarter after a devaluation is an SB country. For these reasons, because the newly devalued \$-level is expected to be maintained, agents adjust quickly, or as soon as the currency-contract period has expired.

The situation is different under floating exchange rates because of the uncertainty of exchange-rate trends. Take, for example, the tail-end of a long period of appreciation. If a currency begins to deteriorate at that time, then agents can only guess that this change constitutes a short-run exchange-rate fluctuation. They wait for further confirmation of the establishment of a new trend before they commence renegotiating contracts or hedge in the exchange market. In addition, agents cannot know beforehand of the full magnitude of a depreciation. Given the recent depreciation and that agents tend

to postpone altering their contracts until an exchange-rate trend becomes apparent, the country becomes reclassified a WB according to Table 2. Thus, a country can undergo a structural change from a strong to a weak bargaining position in the pass-through period. Until the newly established trend for the exchange rate has been confirmed, a country does not fully regain its previous bargaining position.

We studied the duration of this structural adjustment under the floating exchange-rate system, and re-evaluated the pre-1974 experience within this new framework. Our procedure first involved an ex-post identification of periods when a new long-run trend for the strengthening or weakening of the dollar was established. Next, starting forward in time, we looked at short-run fluctuations in the dollar value and how these were reflected a quarter hence in movements of the Terms of Trade (TOT). The movement of TOT allowed us to classify the United States as a strong or weak bargainer throughout the period of analysis. Take, for example, the end of a long period of an appreciating dollar when we were able to classify the United States as fully adjusted and as an SB. Now, if the next period represents the start of a long depreciation, then we would expect the following:

Table 3
CURRENCY DENOMINATION OF TRADE UNDER AN APPRECIATION

<i>Bargaining Strength</i>	<i>Denomination</i>	<i>Trade</i>	<i>Prices</i>	<i>Terms of Trade</i>
Strong Bargainer (SB)	\$	Exports ==>	\bar{P}_x	TOT \uparrow
	fc	Imports ==>	$P_m \downarrow$	
Weak Bargainer (WB)	fc	Exports ==>	$P_x \downarrow$	TOT \downarrow
	\$	Imports ==>	\bar{P}_m	

Legend: \$ = dollars; fc = foreign currency; P_x = export prices; P_m = import prices; a bar over P_x or P_m signifies no change; \uparrow indicates increase; \downarrow indicates decrease.

- 1) During the currency-contract and pass-through periods, the country should lose its SB position for a WB position as a result of uncertainty as to whether the fluctuation was an aberration or the establishment of a new trend. During this period, a country's Trade Balance (TB) temporarily deteriorates before it can improve.
- 2) It is not until continued depreciations supply evidence about a new trend that exporters, importers, and consumers will commence their adjustment process. When this adjustment process has fully matured, the TB improves (or deteriorates less rapidly).

Under these conditions, the TB data should plot the familiar J-shaped curve where the longer duration is accounted for by uncertainty under a floating system, while a reexamination of the J-curve observed by Magee should find a much shorter duration under a system of fixed exchange rates. This is essentially our hypothesis and test. Now, let's look at the data.

III. THE PERIODS OF ANALYSIS.

We have chosen the period between 1970 and the present (see Figure 1), which includes both Magee's original period of dollar devaluation and today's depreciations (or appreciations). Our four subperiods of analysis include:*

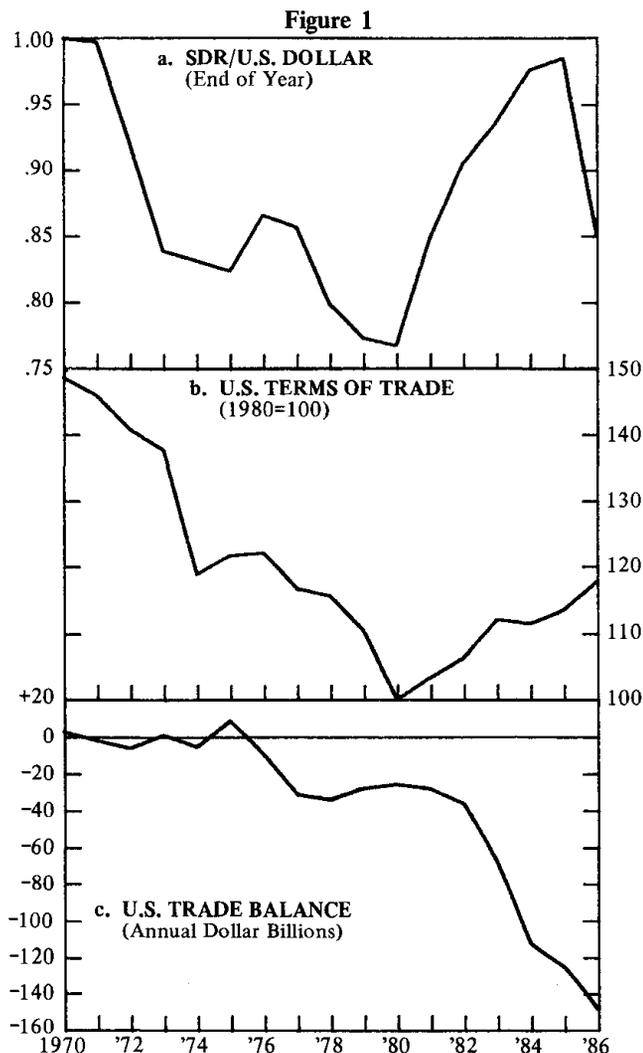
1970 to 1975:	Devaluation
1976 to 1980:	Depreciation
1980 to 1985:	Appreciation
1985 to Present:	Depreciation

These periods were characterized by occasional dollar devaluations, the introduction of the floating exchange rate system and subsequent prolonged dollar depreciation, followed by a prolonged period of appreciation, and the present sharp depreciation, respectively. The last section includes an outlook for the future given current conditions and events.

A. The Devaluations of the Early 1970's.

In marked contrast to later periods we analyze, this early period was characterized by *devaluations* and not *depreciations*. It marked the end of the Bretton Woods system of fixed exchange rates. Furthermore, the devaluations were dictated by the monetary authorities in order to accomplish discretionary goals. Traders could adjust quickly and with more certainty than under a *depreciation* scenario, resulting in a shorter pass-through period

* See Table 4 for a breakdown of countertrend fluctuations within each subperiod.

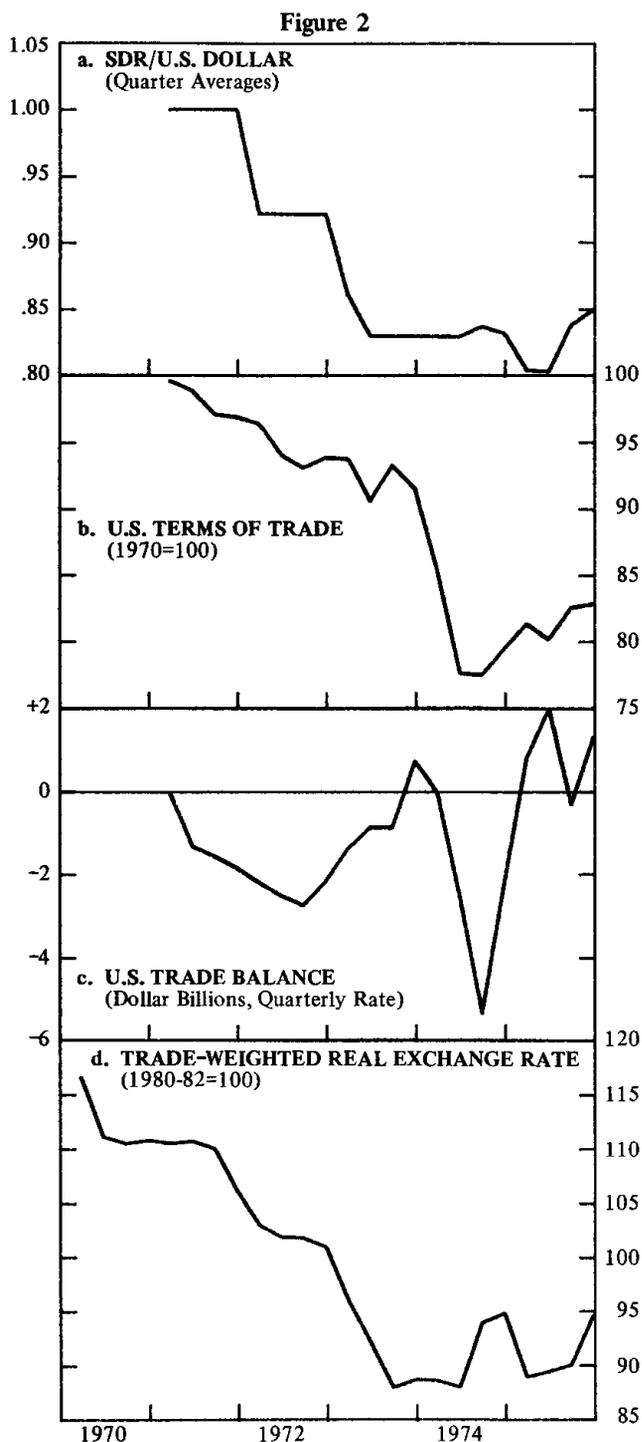


and therefore a faster response in the trade balance. From this period, Magee concluded that the J-curve or adjustment period probably would last approximately 9-12 months. The results of the second and third devaluations (shown in Figure 2a) led him to lengthen that adjustment period to a maximum of 1½ years. Our reconstruction of Magee's pass-through periods using the foregoing procedure indicates that the pass-through period after the first devaluation probably was at the low end (9 months) of the 9-12 month period he suggested. The 1 to 1½ year long pass-through period after the second and third devaluations conforms to our expectations, given that successive devaluations can be supposed to have generated more uncertainty than a single "one time" devaluation.

Following the devaluation at the end of 1971, there is a 1-quarter currency-contract period and then a 2-quarter pass-through period before improvements in the terms of trade indicate an improvement in the U.S. bargaining position. This 3-

quarter lag (as indicated in Figure 2b) also is reflected by the trade balance data, where the balance experiences a 9-month deterioration before improving, as can be seen in Figure 2c.

Then, the United States became an SB for 1 quarter right before the second and third devaluations set in, which resulted in a new adjustment period as a WB. As expected, a quarter of SB followed as



Sources: International Monetary Fund, *International Financial Statistics*; Morgan Guaranty Trust Company of New York, *World Financial Markets*.

the J-curve matured, an event that was quickly upset by the first oil price shock. These events lead us to conjecture that the United States was regaining its bargaining strength well within the 3-quarter total adjustment period after a devaluation. For more accurate results and in order to gain more points of observation, a trade-weighted real exchange rate was used instead of the SDR/U.S. dollar exchange rate, which remained fixed after each devaluation. These data resemble the SDR/U.S. dollar exchange-rate data (compare Figures 2a and 2d) and aided in the discovery of a period of strong bargaining power only 3 quarters (9 months) after the first devaluation.

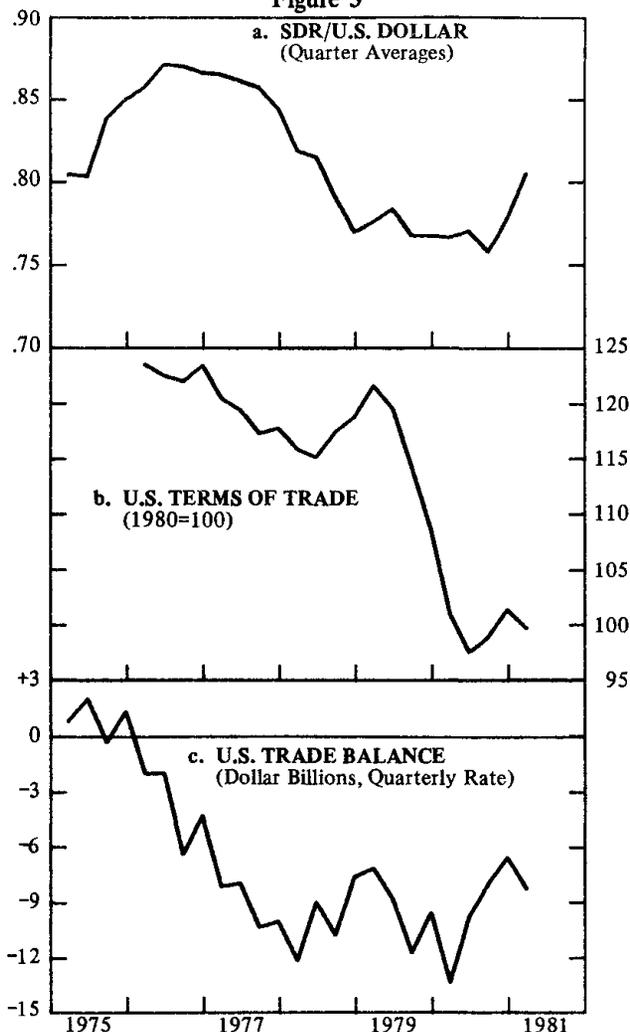
The sharp increase in the price of oil, however, immediately resulted in a sharp drop in the terms of trade and thus made the United States a weak bargainer, overriding any positive effect that the second devaluation might have had. In late 1974, the United States eventually regained its bargaining strength, which it would keep until the first period of depreciation started in late 1976.

B. The First Depreciation: 1976/77-1980.

This is the first period of depreciation as opposed to one of devaluation that occurred. By the end of the 4¼ year period the dollar fell to record lows with respect to the major currencies of the industrialized world, a total drop of 13 percent (see Figure 3a). It was also in this period that the United States started on its path of a seemingly never-ending trade deficit, as shown in Figure 3c. The U.S. economy had experienced a solid economic boom following the 1973/75 recession and the first oil price shock (see Figure 4). In fact, from 1976 to 1978, on average, the United States grew from 1 to 1½ percent faster than the industrialized world. The structural change brought on by the downward trend of the dollar coupled with strong U.S. domestic growth helped bring the United States into trade deficit.

Ordinarily we would expect the trade balance to improve following a depreciation. However, since there now is great uncertainty about the duration and magnitude of a currency depreciation, it takes more time before exporters, importers, and consumers adjust their behavior than in the case of infrequent devaluations. After the dollar began to depreciate in 1976, the adjustment lag between the initial depreciation and the improvement of the trade balance (during which the trade balance deteriorated) lasted 2 years (seen on Table 4). Looking at the trade balance curve we see that there is indeed a fall in the balance of trade from the first quarter 1976 through the first quarter 1978 (see Figure 3c). For the next 4 quarters, the trade balance improved erratically thus giving incipient

Figure 3



Source: International Monetary Fund, *International Financial Statistics*.

shape to our conjectured J-curve. (The 2-year adjustment period coincided with changes in terms of trade, allowing us to classify the United States during this time as a *weak bargainer*.) But throughout this time period, the United States also experienced strong domestic economic growth that brought an increased demand for imports, and the trade balance deteriorated in 3 of the 4 quarters that followed.

Overall, from 1978 to 1980 the trade balance moved only erratically, with few indications that the J-curve effect would soon mature. Indeed, in 1979 the second oil price shock increased import prices dramatically. Thus, the terms of trade fell, the trade balance ceased to improve, and the United States again became a weak bargainer after enjoying a brief period in 1979 of being in a "weak" strong bargaining position. In short, external events subsumed exchange-rate movements that otherwise might have promoted a maturation of the J-curve.

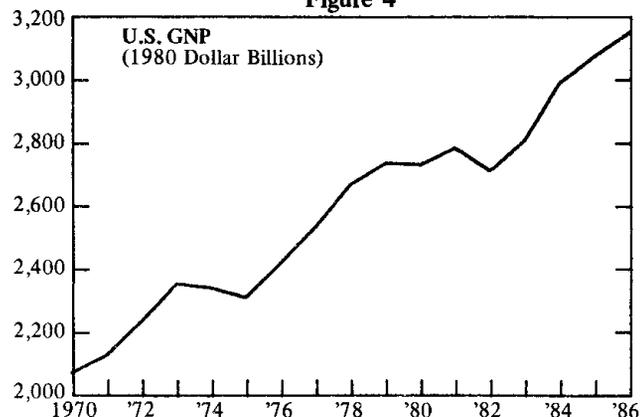
C. The First Appreciation: 1980-1985.

In late 1980, the dollar started to appreciate and would do so for 4½ years more for a total rise of 36 percent (see Figure 5a). Again, one would expect the trade balance to *deteriorate* following an appreciation. However, as in the case of the depreciation above, one would expect a fairly lengthy lag between the initial fall of the dollar and a fall in the balance of trade (a reverse, or upside-down J-curve). During this period, actual events conformed closely to theory. The trade balance deteriorated only slightly during the structural change in the first 2 years – and by very little when compared with what was to happen when the reverse J-curve matured from 1982 to 1986.

Despite the overall conformity of changes in the U.S. trade balance to the J-curve hypothesis during this period, there was one marked departure from theory: a shorter than expected pass-through period. The dollar appreciation of 1980-85 was accompanied by a rapidly *rising* TOT, and from the changes in the terms of trade, we can conjecture only a 1½ year weak bargaining period. By the second quarter of 1982, the United States could again be classified as an SB as defined by a positive terms of trade movement. We believe that the drop in the price of oil, which occurred in the second quarter of 1982, contributed to the "premature" fall in import prices and thus drove up the terms of trade (remembering that $TOT = P_x/P_m$). Please refer to Table 4 in the appendix for a time line of this period. Had oil prices not fallen, the lag may have been closer to 2 years – or longer.

Starting with 1982, the trade balance took a nose dive as the reverse J-curve matured. The resulting terms of trade movement allows us to classify the United States as a *strong bargainer* once again, marking the end of the adjustment period. Importers and exporters recognized the new up-

Figure 4



Source: International Monetary Fund, *International Financial Statistics*.

ward trend in the exchange rate and changed their behavior accordingly. In addition, U.S. GNP growth further fueled the import boom as the country entered one of its longest recovery periods since World War II. On average, the United States grew 2 and 3 percent faster in 1982 and 1983 than other industrialized countries. These factors may largely account for the severe trade deficit that characterized this period.

D. The Recent Depreciation and Outlook for the Future

The most recent depreciation occurred faster (about 2½ years versus more than 4 years) and has been of far greater magnitude than the other two changes of our analysis (see Figure 5a).

The rapidity and magnitude of this latest dollar depreciation pose a number of theoretical difficulties unlike those encountered in the earlier episodes of depreciation. Very simply, that the drop in the dollar's value occurred so abruptly (see Fig-

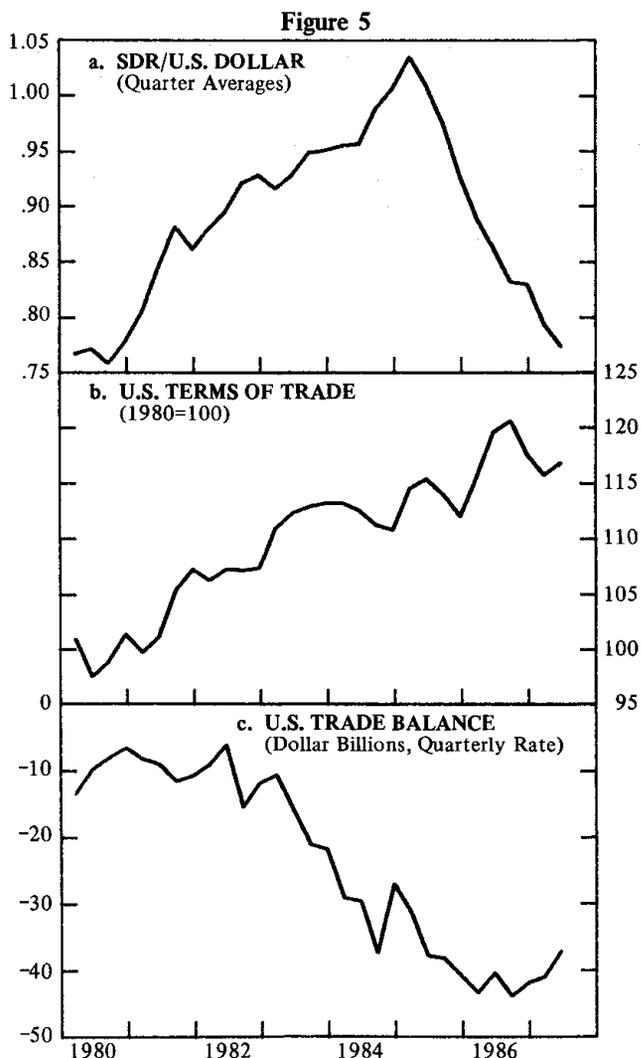
ure 5a) might imply that, at least during its initial stages, exporters and importers might be hesitant to view it as an established trend – as during less precipitous periods of depreciation. On the other hand, the *magnitude* of the decrease in the dollar's value would imply that agents perceived that they were at greater risk because of such severe changes, and therefore would be quicker to hedge contracts or create new types of contracts to eliminate their risk exposure. In short, with respect to the presumed behavior of agents of international trade, there would seem to be far greater theoretical uncertainty about the early stages of the current period of depreciation than during the other sub-periods we studied.

In any event, other external factors tended to mitigate the presumed “accelerating” effects of the magnitude of the recent dollar depreciation. First, immediately following the initial depreciation in March 1985 (a trend reversal), the TOT deteriorated, indicating that the United States became a WB, a position that it retained through the first half of 1987. Moreover, with relatively weak economic growth in the major trading partners of the United States, the trade deficit continued to plummet.

Both the weak bargaining position of the United States and the weak economic growth in other countries have contributed to the severity of today's record trade deficits (see Figure 1c). Recent reports indicate that the trade deficit may have started to turn around, some 2½ years after the start of the depreciation. First, the TOT improved during the third quarter 1987, which implies that the bargaining position of the United States is improving and that it has become a “weak” SB. Due mostly to gains in manufacturing, unemployment recently dipped under 6 percent, its lowest level in several years, and exports have boosted U.S. industrial capacity usage. The improvements of the trade balance are slight at best, but they point toward possible further improvement.

However, events since August have added to the uncertainty of exporters and importers who are again waiting to see where the exchange rate is headed: the dollar stabilized briefly, only to plummet again in the wake of the Stock Market Crash of 1987. All of these factors theoretically would seem to contribute to a longer lag between a depreciation and the improvement of the trade balance. And as has happened previously, external events might again overtake the J-curve.

At a time when a change in the bargaining position of the United States either is already occurring or is about to occur, external shocks are of crucial importance in delaying or accelerating the maturation of the J-curve. For example, the movement of

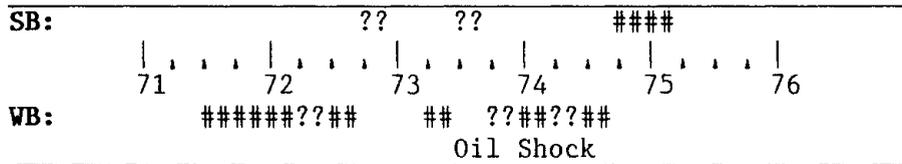


Source: International Monetary Fund, *International Financial Statistics*.

Table 4

CLASSIFICATIONS ACCORDING TO BARGAINING POWER WITHIN PERIODS

	<u>Exchange Rate</u>	<u>Period</u>	<u>TOT</u>	<u>Period</u>	<u>Classification</u>
First Period. Under Fixed Exchange-Rate System.					
1.)	Devaluation	72:1	Fall	72:2	WB --
2.)	Devaluation	73:1	Fall	73:2	WB --
3.)	Devaluation	73:2	Rise	73:3	SB ++
1a.)	TW RER Appreciation	71:2	Fall	71:3	WB --
2a.)	TW RER Depreciation	71:3	Fall	71:4	WB --
3a.)	TW RER ACC Depreciation	71:4	Fall	72:1	WB -
4a.)	TW RER DEC Depreciation	72:2	Fall	72:3	WB -
5a.)	TW RER ACC Depreciation	73:1	Fall	73:2	WB -
6a.)	TW RER Appreciation	73:4	Fall	74:1	WB --
7a.)	TW RER Depreciation	74:2	Fall	74:3	WB --
8a.)	TW RER Appreciation	74:3	Rise	74:4	SB ++
9a.)	TW RER Appreciation	74:4	Fall	75:1	SB +

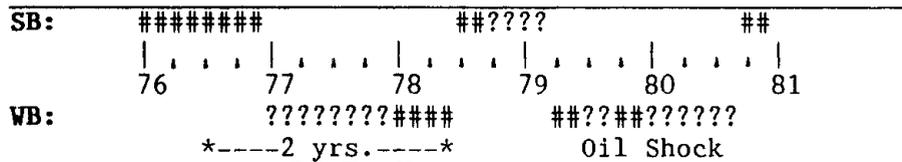


First Period. Under Floating Exchange-Rate System.

4.)	Appreciation	74:3	Rise	74:4	SB ++
5.)	Depreciation	74:4	Rise	75:1	SB ++
6.)	ACC Depreciation	75:1	Fall	75:2	WB -
7.)	Appreciation	75:2	Rise	75:3	SB ++

Second Period. Characterized by a Long-Run Trend of Depreciation.

8.)	Depreciation	76:3	Fall	76:4	SB ++
9.)	ACC Depreciation	77:4	Fall	78:1	WB -
10.)	ACC Depreciation	78:1	Rise	78:2	WB -
11.)	DEC Depreciation	78:2	Fall	78:3	SB +
12.)	Appreciation	79:1	Fall	79:2	WB --
13.)	Depreciation	79:3	Rise	79:4	WB --
14.)	ACC Depreciation	80:3	Rise	80:4	SB +



LEGEND: ## indicates relatively greater confidence in the reliability of bargaining classifications, and ?? indicates relatively less confidence in the bargaining classifications for quarters where notations appear. Notations above the time line refer to SB classifications; those below the time line refer to WB classifications. TW RER = Trade-weighted real exchange rate; ACC = accelerating; DEC = decelerating.

Table 4 (Continued)

	<u>Exchange Rate</u>	<u>Period</u>	<u>TOT</u>	<u>Period</u>	<u>Classification</u>
Third Period. Characterized by a Long-Run Trend of Appreciation.					
15.)	Appreciation	80:4	Fall	81:1	WB --
16.)	Depreciation	81:4	Fall	82:1	WB --
17.)	Appreciation	82:1	Rise	82:2	SB ++
18.)	DEC Appreciation	82:4	Rise	83:1	SB +
19.)	Depreciation	83:1	Rise	83:2	SB ++
20.)	Appreciation	83:2	Rise	83:3	SB ++
21.)	DEC Appreciation	84:1	Fall	84:2	WB -
22.)	ACC Appreciation	84:3	Fall	84:4	WB -
SB:	##	##	#####		##??
	80	81	82	83	84
WB:	??????	##??????##		##	##
					##??????????###
			^P Oil Drop		
	--1½ yrs--				*-----2¼ yrs-----*

Fourth Period. Current Depreciation.

23.)	Depreciation	85:2	Fall	85:3	WB --
24.)	DEC Depreciation	86:4	Fall	87:1	WB -
25.)	ACC Depreciation	87:1	Fall	87:2	WB -
26.)	DEC Depreciation	87:2	Rise	87:3	SB +
27.)	Slight Appreciation	87:3	Rising?		

LEGEND: ## indicates relatively greater confidence in the reliability of bargaining classifications, and ?? indicates relatively less confidence in the bargaining classifications for quarters where notations appear. Notations above the time line refer to SB classifications; those below the time line refer to WB classifications. ACC = accelerating; DEC = decelerating.

oil prices has previously affected the bargaining position of U.S. exporters and importers both negatively and positively and could do so again. The events in the Persian Gulf region in the past months have created tensions for which price implications are by no means clear. But should an upward oil price trend become evident, then the terms of trade likely would be lowered, and an improvement of the trade balance retarded. On the other hand, the growth rate of U.S. GNP decreased slightly, and the U.S. Government is putting pressure on such important trading partners as Japan and Germany to boost their own domestic demand in order to stimulate foreign imports (*i.e.*, U.S. exports). At this point, no one can say if the "free trade" agreement recently negotiated between the United States and Canada will actually be put into effect, but, if it is, it could have a major impact on U.S. trends. Although it would be premature to speculate on the eventual impact of October's world financial panic, the drop in the dollar's exchange rate since then would seem to favor reduced imports. This effect, on the other hand, could well be offset by reduced demand for exports as a result of foreign caution following the stock market collapse.

In sum, the outlook is uncertain. Prior to the stock market crash, American exporters and importers seemed to be changing their contract be-

havior, reflecting an adjustment to the low level of the dollar (this adjustment was by no means completed). However, the future movement of the dollar is now totally uncertain, and the situation in the world financial markets has compounded the uncertainty that already surrounded the oil price question — as well as prospects for economic growth among America's major trading partners.

IV. CONCLUSIONS.

From the broad perspective of economic theory, our analysis of the J-curve phenomenon suggests how vulnerable "models" — even ones so simple as the J-curve — constructed on the basis of limited experience are to changes in the transactional field of observable events. The magnitude of exchange-rate movements and the importance of external shocks are subjects that economists rarely discuss in relation to the maturation or curtailment of J-curve phenomena. But these factors have crucially significant implications for the "lag" between a devaluation and trade balance improvement — if such improvement occurs at all.

Our analysis strongly suggests that, as appealing as easily grasped notions such as the J-curve may be as heuristic devices or as media "handles," their predictive usefulness in "real" situations tends to be severely constrained by external events. That is,

logically correct models often cannot accommodate *unexpected* events (*i.e.*, those things that the theorist overlooked or failed to foresee). In this respect, we would recall attention to Professor Magee's initial taxonomy of possible events following a currency devaluation, which he described as follows:

"The two alternatives for exports and the two for imports suggest an overall taxonomy of four possible cases of contracting for exports and imports. . . . Case 1, combining alternatives XFC and M\$, assures an improvement in the U.S. trade balance, whether measured in dollars or in foreign currency, since exports increase in dollars, while imports fall in foreign currency. Case 2, which combines alternatives XFC and MFC, involves no change in the U.S. trade balance in foreign currency. However, it goes up or down, or stays constant in dollars, depending on whether the initial situation was surplus, deficit, or balance. Case 3, which combines X\$ and M\$, is similar: no change in dollars and a three-way possibility in foreign currencies. Case 4 – the combination of X\$ and MFC – yields an unambiguous deterioration: A capital loss is experienced on U.S. exports in foreign currency and on imports in dollars.

"Thus, the initial portion of the J-curve – the decline in the U.S. trade balance measured in dollars in the currency-contract period – is inevitable only in case 4, and is possible in only one other case – case 2 – providing U.S. trade was initially in deficit."⁶

With so many possible exchange-rate, currency-contract, and "external" variables, it would seem to be virtually impossible to predict "how long" it would take for J-curve phenomena to become manifest in a complex situation such as that existing today.

We would suggest that J-curve effects as postulated by Professor Magee continue to influence the trade balance, but, as implied by his initial cautions, only as one of many possible factors exercising other reinforcing or offsetting effects.

Appendix.

The fixed exchange rate system was not abandoned overnight. What follows is a brief chronology of the events that led to a floating exchange rate system.

August 23, 1971: Official exchange rates of all major currencies except the Japanese yen were abandoned; the currencies began to "float."

December 18, 1971: The finance ministers of the G-10 countries met in Washington and agreed to set new parities among their currencies. Additional features of this "Smithsonian" agreement included (1) a widening of the ± 1 percent of par value to $\pm 2\frac{1}{4}$ percent, (2) a devaluation of the U.S. dollar from \$35 to \$38 per ounce of gold.

June 23, 1972: The exchange rate of the pound was floated, *i.e.*, allowed to exceed the fluctuation permitted by the Smithsonian Agreement. Within a year many other countries, including Switzerland, Italy, Japan, and Germany, also floated their currencies.

February 13, 1973: Another devaluation of the dollar is announced by the United States, from \$38 per ounce to \$42.22 per ounce of gold.

July 1, 1974: The IMF ceased specifying an SDR as 1/35th of an ounce of gold and began specifying the "value" of an SDR as a weighted average of 16 major currencies. The "value" is calculated daily.

In our 1970 to 1975 period, the devaluations we refer to are technically the devaluations of the SDR (measured as the inverse of the official dollar price of one ounce of gold) in terms of gold. The August 23, 1971 "float" only allowed the currencies to move within a ± 1 percent band. A larger band was substituted in December of that year, and it allowed for larger fluctuations, especially downward. We believe it was this event that was viewed by importers and exporters as the first fixed or occasional devaluation.

End Notes

¹ See *U.S. News & World Report*, July 27, 1987, p. 51.

² *Ibid.*

³ Stephen P. Magee, "Currency Contracts, Pass-through, and Devaluation," *Brookings Papers on Economic Activity*, 1:1973, p. 305.

⁴ *Ibid.*, p. 308.

⁵ These gains or losses are to a large extent determined by the degree of hedging in the exchange-rate markets by exporters and importers.

⁶ Magee, *op. cit.*, p. 310. X = exports; M = imports; FC = foreign currency; \$ = dollars.

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