

"Managing the Dollar;
Has the Plaza Agreement Mattered?"

Michael Klein
Clark University

Bruce Mizrach
Boston College

Robert G. Murphy
Boston College

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Michael Klein
Assistant Professor
Department of Economics
Clark University

Bruce Mizrach
Assistant Professor
Department of Economics
Boston College

Robert G. Murphy
Assistant Professor
Department of Economics
Boston College

Address for correspondence:

Robert G. Murphy
Department of Economics
Boston College
Chestnut Hill, MA 02167

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Comments Welcome

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Abstract

This paper considers whether the Plaza Agreement of September 1985 marked the beginning of a fundamental shift in the exchange-rate policy regime for the United States, West Germany, and Japan. Using a simple monetary model of the open economy, the analysis illustrates the response of the exchange rate to news about the trade balance under the assumption that policymakers actively manage the adjustment of external imbalances through monetary policies. The paper finds that U.S. dollar exchange rates against the Japanese yen and the West German mark respond strongly to news about the U.S. trade deficit during the period following the Plaza Agreement, but do not respond at all during the period preceding the Agreement. This evidence is consistent with the predictions of the simple model and suggests that the Plaza Agreement represented a significant shift in the policy regime among the major industrial countries.

1. Introduction

The agreement in September of 1985 among the finance ministers and central bankers of the major industrial countries, commonly known as the Plaza Agreement, has been described by some analysts as a watershed in the active management of exchange rates among the industrial countries. Several observers have attributed the dollar's sharp fall in value during 1986-87 and its stability during 1988 to subsequent shifts in policies engineered in the cooperative environment engendered by the Plaza Agreement. For the most part, though, the evidence presented in support of this view, while highly suggestive, has been far from rigorous.¹

In this paper we take a closer look at the question of whether the Plaza Agreement marked a turning point in the policymaking process. We do this by postulating that concern over exchange rates ultimately reflects concern over external imbalances in trade flows. Accordingly, a change in policy should occur when adjustment in external balances fails to match prior expectations. Using a simple open economy model, we characterize the response of exchange rates and interest rates to unexpected movements in the external balance under a scenario in which the authorities actively manage the adjustment of the external balance through monetary policies. We find that exchange rates should respond contemporaneously to news of an unexpectedly high or low external balance.

To test the predictions of the model, we analyze daily data on U.S. dollar exchange rates vis-a-vis the West German deutschemark and

¹Funabashi (1988) provides a behind-the-scenes account of the attempts by policymakers in the major industrial countries to bring about adjustment of the dollar.

the Japanese yen over the period 1980 to 1988. We employ an event-study methodology in order to determine the response of exchange rates to unexpected movements in the U.S. trade balance. We measure news about the trade balance as the difference between the official monthly figure and forecasts developed by Money Market Services, Inc. The results show that prior to the Plaza Agreement (September 1985) there is no systematic response of dollar exchange rates to unexpected movements in the trade balance, whereas following the Agreement there is a strong contemporaneous response. This evidence is consistent with the predictions of our simple model and points to the conclusion that the period following the Plaza Agreement has represented a shift in the policy regime among the industrial countries.

The paper is organized as follows. Section 2 presents a simple monetary model of the open economy and emphasizes the role of expected future policies in determining the exchange rate. Section 3 briefly describes our empirical methodology and presents our results. The paper concludes with a short summary.

2. Trade Balance Announcements and the Exchange Rate

This section employs a sticky-price monetary model of exchange rate determination to analyze the effects of trade-balance announcements on exchange rates.² The model is a modified version of the two-country

²An alternative framework for analyzing exchange rates is the portfolio balance model which highlights the role of asset accumulation in determining the exchange rate. Empirical tests of the portfolio balance approach, however, have typically found little support in the data (see for example, Frankel, 1982). In choosing to use the sticky-price monetary model of exchange rates, we leave aside issues concerning the impact of external imbalances on asset accumulation in determining exchange rates and instead concentrate on the link between external imbalances and the reaction of the monetary authorities.

model developed by Frankel (1979) from the small-country model originated by Dornbusch (1976).³ The key feature of the model is the assumption that policymakers react to news concerning the trade balance by altering the future path of monetary policy in order to bring about desired adjustment in the external balance.⁴ Market participants adjust their expectations concerning future monetary policy accordingly when news about the trade balance is revealed, thereby inducing adjustment in the exchange rates and interest rates.

Money market equilibrium in the domestic and foreign countries is assumed to hold continuously:

$$(1) \quad m_t - p_t = -\lambda i_t + y_t$$

$$(2) \quad m^*_t - p^*_t = -\lambda i^*_t + y^*_t$$

where m_t is the logarithm of the domestic money supply, p_t is the logarithm of the domestic price level, i_t is the domestic very short-term interest rate (overnight rate), and y_t captures the effects of real income on money demand.⁵ Equivalent definitions of the variables hold for the foreign country and are denoted by an asterisk. We assume equal interest and income elasticities of money demand in both countries for

³In allowing for departures from long-run purchasing power parity, our model is similar to frameworks presented by Hooper and Morton (1982) and Obstfeld (1985).

⁴In keeping with the essentially descriptive nature of this analysis, we make no attempt to justify the optimality (or lack thereof) of why the authorities desire to target the external balance. Evidence for the industrial countries during the post-war period, however, strongly suggests that this motive is operative (Fieleke, 1982; Summers, 1988).

⁵We assume a unitary elasticity of money demand with respect to income for convenience. Altering this assumption has no effect on our results.

convenience. Capital mobility links the expected returns on assets denominated in domestic and foreign currencies. We allow for the possibility of a risk premium in the relationship between these returns:

$$(3) \quad E_t e_{t+1} - e_t = i_t - i^*_t + R_t$$

where e_t is the domestic price of foreign currency, R_t is the risk premium on foreign assets relative to domestic assets, and the notation $E_t x_{t+1}$ represents expectation of variable x in period $t+1$ conditioned on information in period t .

National price levels are assumed to be sticky in the short run and are assumed to adjust only gradually over time in response to conditions of excess demand in goods markets. We assume, however, that in long-run equilibrium, when prices have fully adjusted, the exchange rate equals the difference in national price levels augmented by a term intended to capture shifts in the equilibrium real exchange rate ($\bar{q}_t$):

$$(4) \quad \bar{e}_t = \bar{p}_t - \bar{p}^*_t + \bar{q}_t$$

where a "bar" over a variable denotes its long-run equilibrium value. By substituting for price levels in equation (4) using equations (1) and (2) and substituting for the interest differential using equation (3), we obtain the following relationship:

$$(5) \quad \bar{e}_t = [m_t - m_t^*] + \lambda[E_t \bar{e}_{t+1} - \bar{e}_t] - [y_t - y_t^*] + \bar{q}_t - \lambda R_t.$$

This difference equation can be solved forward, ruling out bubble solutions by assumption, to yield an expression for the long-run equilibrium value of the exchange rate:

$$(6) \quad \bar{e}_t = [1/(1+\lambda)] \sum \{ [\lambda/(1+\lambda)]^i \{ E_t M_{t+i} - E_t Y_{t+i} + E_t \bar{q}_{t+i} - \lambda E_t R_{t+i} \} \}$$

where $M_{t+i} = m_{t+i} - m^*_{t+i}$ and $Y_{t+i} = y_{t+i} - y^*_{t+i}$. From equation (6), it is apparent that the long-run equilibrium value of the exchange rate will depend on the entire future path of relative money supplies and income levels.

As mentioned above, national price levels are assumed to adjust gradually in the short run in response to the level of excess demand in goods markets, over and above adjustment required by the rates of on-going inflation. This assumption, along with the assumption of rational expectations, has been shown by Frankel (1979) to imply the following relationship:

$$(7) \quad E_t e_{t+1} - e_t = \theta [\bar{e}_t - e_t] + [E_t \bar{e}_{t+1} - \bar{e}_t]$$

where the expected adjustment of the current exchange rate is determined by the difference between the current exchange rate and its equilibrium value (the first term on the right-hand side of equation (7)), and by the expected adjustment in the long-run equilibrium exchange rate itself (second term). By equating the right-hand sides of equation (7) and equation (3), we obtain the following expression:

$$(8) \quad e_t = \bar{e}_t + [1/\theta] [E_t \bar{e}_{t+1} - \bar{e}_t - R_t - i_t + i^*_t]$$

where the current exchange rate is related to its current and expected long-run equilibrium values, the risk premium, and the interest differential.

We are interested in characterizing the response of the exchange rate after expectations are updated due to an announcement of the trade balance but before any policy change occurs. To do this, we use a subscript t' on variables to denote their value following the announcement of the trade balance. Accordingly, the change in the exchange rate between the period just prior to the announcement and the period just after the announcement is given by $[e_{t'} - e_t]$. Since this time interval is very small (only twenty-four hours for our data set as described in Section 3), we assume that factors influencing money demands, such as the real incomes, do not change. Given that any policy induced changes in money supplies have not yet occurred and that prices are sticky, the constancy of real incomes implies that interest rates are also unchanged. As a result, equation (8) can be differenced and the change in interest rates set to zero to yield:

$$(9) \quad e_{t'} - e_t = \bar{e}_{t'} - \bar{e} + [1/\theta] \{ [E_t \bar{e}_{t+1} - \bar{e}_{t'}] - [E_t \bar{e}_{t+1} - \bar{e}_t] - [R_{t'} - R_t] \}.$$

By using equation (5), we can derive an expression for the change in the expected long-run equilibrium rate of depreciation:

$$(10) \quad \{ [E_t \bar{e}_{t+1} - \bar{e}_{t'}] - [E_t \bar{e}_{t+1} - \bar{e}_t] \} = [1/\lambda] \{ [\bar{e}_{t'} - \bar{e}_t] - [\bar{q}_{t'} - \bar{q}_t] \} + [R_{t'} - R_t]$$

where we have made use of the fact that there is no change in real incomes or money supplies during the interval between the period prior to the announcement and the period following the announcement. We can use equation (10) to substitute for the expected long-run equilibrium rate of depreciation in equation (9), and rearrange, to obtain:

$$(11) \quad e_{t'} - e_t = [1+1/\lambda\theta] [\bar{e}_{t'} - \bar{e}_t] - [1/\lambda\theta] [\bar{q}_{t'} - \bar{q}_t].$$

Finally, substituting for $[\bar{e}_{t'} - \bar{e}_t]$ in equation (11) using equation (6) yields:

$$(12) \quad e_{t'} - e_t = [1+1/\lambda\theta] [1/(1+\lambda)] \sum [\lambda/(1+\lambda)]^i \{ [E_t, M_{t+i} - E_t M_{t+i}] - [E_t, Y_{t+i} - E_t Y_{t+i}] \\ + [E_t, \bar{q}_{t+i} - E_t \bar{q}_{t+i}] - \lambda [E_t, R_{t+i} - E_t R_{t+i}] \} \\ + \lambda[\theta-1]/\{[1+\lambda]\lambda\theta\} [\bar{q}_{t'} - \bar{q}_t] - [\lambda\theta+1]/[1+\lambda]\theta [R_{t'} - R_t]$$

where the change in the exchange rate is related to changes in the expected future paths of relative money supplies, relative real incomes, the equilibrium real exchange rate, and the risk premium, as well as changes in the current equilibrium real exchange rate and the current period risk premium.⁶

Equation (12) relates the change in the spot exchange rate between the time immediately before and immediately after the trade balance announcement to changes in the current and expected future values of fundamentals. New information concerning the trade balance could affect both current and expected future values of the fundamentals, thereby

⁶Once again we have made use of the fact that there is no change in the current values of money supplies or real incomes during the interval of time between t and t' .

requiring adjustment in the current exchange rate. If the channel through which new information affects the exchange rate is the current and/or the expected future values of the risk premium or the equilibrium real exchange rate, the response of the exchange rate to trade balance announcements should be observed throughout our sample period. On the other hand, if the channel of transmission involves the coordinated reaction of future monetary policies, then the response of the exchange rate to trade balance announcements should only be observed during episodes of coordination.

The hypothesis that we test below is that the Plaza Agreement of September 1985 marked a change in policy regime toward one in which monetary policies are coordinated so as to promote adjustment of the U.S. external deficit. Under this hypothesis, we should observe a break in the relationship between dollar exchange rates and U.S. trade balance announcements shortly after September 1985. Our ability to distinguish this policy-related break in the data is, however, obviously limited if information about the trade balance also affects fundamentals other than monetary policies.

3. Empirical Results

We employ an event-study methodology to examine how the foreign exchange market reacts to the release of information concerning the aggregate U.S. trade balance. Our approach is similar to previous studies that have considered how announcements of economic data affect financial market variables.⁷ We compute the information contained in an

⁷See, for example, papers by Cornell (1982), Engel and Frankel (1984), and Hardouvelis (1988).

announcement of the trade balance as the difference between the announced value and the expectation held by market participants prior to the announcement. To proxy the expectation of market participants, we use forecasts of the trade balance developed by Money Market Services, Inc., a private firm that polls market participants approximately one week prior to the monthly announcement of the trade balance.⁸

The sample period we study is January 1980 through April 1988. We use data for the U.S. dollar's exchange value against the Japanese yen and the West German deutschemark obtained from bid quotations in the New York market. The change in the exchange rate is computed as the difference between its value at 4:00 p.m. the day before the announcement and its value at 4:00 p.m. the day of the announcement.⁹

Table 1 presents regressions of the change in the dollar's exchange value on a constant term and the unexpected component of the trade balance. We chose to split the sample between February and March 1986 on the basis of a moving sample Chow test for structural stability.¹⁰ This break represents the approximate timing of our hypothesized shift in the policy regime following the Plaza agreement.¹¹

⁸Alternatively, we could use an ARIMA model to develop a monthly forecast series for the trade balance. This approach, however, would only incorporate information available one month before the announcement and would ignore information available more recently. The advantage of using the survey-based expectations series is that it incorporates information up to a week before the announcement.

⁹From January 1980 to November 1983, the trade-balance data were released at 2:30 p.m. From December 1983 on, the data were released at 8:30 a.m.

¹⁰The statistic computed was $F_t = [(\epsilon_T' \epsilon_T - (\epsilon_1' \epsilon_1 + \epsilon_2' \epsilon_2))/k] / [(\epsilon_1' \epsilon_1 + \epsilon_2' \epsilon_2) / (n_1 + n_2 - 2k)]$, where $\epsilon_\tau' \epsilon_\tau$ is the sum of squared residuals from the surprise regression for the whole sample ($\tau = T$), for regime one ($\tau = 1$), for regime two ($\tau = 2$); and where $(n_1 + n_2)$ equals the sample size, and k equals the number of parameters estimated.

¹¹In particular, the local peak for the Chow statistic for both the Japanese Yen and the West German Deutschemark occurs in March 1986. Although this represents a lag of five months from the actual agreement in September 1985, it is consistent with the view that a change in the policy regime requires some time to become credible to

For the earlier period, we can not reject the hypothesis that the coefficient on the unexpected component of the trade balance is equal to zero.¹² For the latter period, though, the coefficient on the unexpected component of the trade balance has the correct (negative) sign and is significantly different from zero at standard levels. The regressions explain 39-percent and 42-percent, respectively, of the variation in the yen and deutschemark rates over the period March 1986 through April 1988, a remarkably large amount for an event study.¹³ The shift from an episode during which dollar does not respond at all to information about the trade balance to one in which it does respond, is consistent with the hypothesis that the Plaza agreement marked a turning point in the coordination of economic policies.¹⁴

4. Summary

This paper has considered whether the agreement in September 1985 among the finance ministers and central bankers of the major industrial countries, commonly known as the Plaza Agreement, represented a fundamental shift in the exchange-rate policy regime of these countries. Using a simple two-country model of the open economy, we were able to

market participants. We tested the sensitivity of our results by also estimating the regressions over subsamples split between September and October of 1985. The results were virtually identical to those reported in the text.

¹²Our finding that the U.S. dollar's exchange value does not respond to trade balance announcements during the earlier subsample is consistent with Hardouvelis (1988) who examined data only through 1984 and found no effects from trade balance announcements on the dollar's value.

¹³Our estimates suggest that a surprise of three-billion dollars in the monthly trade deficit moves the yen and the deutschemark by approximately one-percent in value against the U.S. dollar.

¹⁴We make no judgement here on the question of whether policy coordination aimed at stabilizing nominal exchange rates is desirable. See Feldstein (1989) for a discussion of the potentially harmful effects of using monetary policies to stabilize nominal exchange rates.

isolate the response of the exchange rate to unexpected movements in the trade balance under the assumption that policymakers actively manage adjustment of external imbalances through monetary policies. From our empirical analysis we found a strong relationship between exchange rates and news about the trade balance during the period after the Plaza agreement, but found no relationship at all during the period preceding the agreement. This evidence suggests to us that the Plaza agreement represented a shift in the policy regime among the industrial countries toward a more active stance in managing external imbalances through monetary policy coordination.

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Table 1

Exchange Rates and Trade Balance Announcements

Dependent Variable	Unexpected Component of Trade Balance	Time Period	$\bar{R}^2$
Yen	-0.329 (0.421)	80:1-86:2	-0.005
	-3.793 (0.917)	86:3-88:4	0.392
Deutschemark	-0.444 (0.375)	80:1-86:2	0.005
	-3.826 (0.860)	86:3-88:4	0.429

Note: Dependent variable is measured as the log difference of the exchange rate. All reported coefficients and standard errors (in parentheses) are equal to their actual values multiplied by 10^3 . A constant term was included in the regressions but is not reported here.