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Recent Turmoil in Emerging Markets and the Behavior of Country-Fund Discounts: Renewing the Puzzle of the Pricing of Closed-End Mutual Funds

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## Abstract

This paper argues that recent movements in closed-end emerging markets funds present a strong challenge to the leading explanations of the behavior of closed-end country fund prices. In particular, closed-end funds dedicated to Mexico and other Latin American stock markets developed large premia after the December 1994 devaluation of the Mexican peso and the subsequent financial crisis. The so-called "investor sentiment hypothesis" could explain these events only by suggesting that investors became very optimistic about emerging markets stocks, and especially Mexican stocks; this possibility seems unlikely given the facts surrounding the devaluation. We argue instead that a sensible explanation for recent dynamics of closed-end country funds is that investors in these funds are loss-averse, implying that they do not want to realize paper losses on their closed-end fund shares. This works to put a drag on the downward movement in closed-end fund prices.

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## Summary

It is well known that shares of closed-end funds usually trade at discounts to the net asset value of the underlying basket of securities. However, closed-end funds do, on occasion, trade at premiums. Although a wide variety of explanations have been advanced to explain deviations of price and net asset value, only the "investor sentiment" hypothesis of Lee, Shleifer, and Thaler (1990) can potentially account for the dynamics of such deviations. Their argument is that investors in closed-end funds--mostly small investors--trade on the basis of factors besides information, in particular, on the basis of "sentiment". This hypothesis could explain why fund prices deviate from the value of the underlying assets: when small investors are pessimistic, funds trade at a discount, and when they are optimistic, funds trade at a premium.

While this hypothesis has gained much currency in its application to pricing of closed-end funds that invest in U.S. securities, it is hard to see how it could explain recent movements in closed-end country funds, especially Mexico funds. The paper notes that, in particular, closed-end funds dedicated to Mexico and other Latin American stock markets developed large premia after the December 1994 devaluation of the Mexican peso and the subsequent financial crisis. The investor sentiment hypothesis could explain these events only by suggesting that investors are optimistic about Mexican stocks; this possibility seems unlikely given the facts surrounding the devaluation.

The recent crisis in Mexico erupted with the announcement on December 20, 1994 by Mexican authorities that the peso would be devalued immediately by 13 percent. Although there had been a gradual deterioration in Mexican financial markets throughout 1994, by most accounts critical information (notably, on foreign reserves) that pointed to the seriousness of the problem was lacking in the run-up to the devaluation, and international investors were caught off guard by the devaluation. The information contained in the announcement caused enormous negative adjustments in Mexican financial markets.

It seems reasonable to conclude that this shock induced pessimism in investors in closed-end Mexico funds about securities returns in Mexico, and thus, according to Lee, Shleifer, and Thaler, would have widened the discount on Mexico closed-end funds. In fact, after December 20, modest discounts turned into very large premiums for all closed-end Mexico funds. Their paper argues instead that a sensible explanation for recent dynamics of closed-end country funds is that investors in these funds are loss averse, which implies that they do not want to realize paper losses on their closed-end fund shares. This aversion to losses works to put a drag on the downward movement in closed-end fund prices.

# I. Introduction

A rich empirical literature has emerged on the puzzling behavior of the prices of closed-end funds. Unlike open-end funds, where the managing firm issues and redeems claims on the asset pool on demand, claims on closed-end funds are not redeemable and therefore trade on secondary securities markets. 1/ If securities markets are "efficient" and traders are rational, it would be expected that market prices of closed-end fund shares would equal the value of the underlying assets that the share has claim to. However, it is well-known that this is not the case: a typical fund's share price is often markedly different than the underlying value of the assets which the share has claim to (the net asset value, or NAV). In fact, closed-end funds generally trade at a discount to NAV, but they do occasionally trade at a premium.

In the next section, we review the various ideas that have been put forward to explain this apparent anomaly. While each of them offers some interesting insight into closed-end fund pricing, only one can potentially explain the cross-sectional and time-series properties of closed-end fund discounts. Specifically, Lee, Shleifer and Thaler (1990a,b) (henceforth LST) present an explanation centered on small investor sentiment. They argue that individual investors are the main investors in closed-end funds and that they trade based on something other than news--"sentiment." This "noise trader risk" affects assets held by small investors (such as closed-end funds) and thus is not diversifiable. If individual investors are bullish relative to investors in the underlying assets (mainly institutional investors), closed-end funds will display premiums; if they are relatively bearish, they will display discounts. But even if they are neutral, closed-end funds will trade at discounts because of this (priced) noise-trader risk, and thus this is consistent with the observation that closed-end funds typically trade at a discount.

Although LST's hypothesis is not without critics (see Chen, Kan and Miller (1993)), we present some evidence on closed-end fund discounts that seems extremely difficult to interpret through the lens provided by LST, or indeed through the lens provided by any other existing explanation. Specifically, we show that the turmoil that erupted in late 1994 in Mexico and that subsequently spilled over into other countries worked to at least reduce discounts, and in many cases, to produce very large premia for country funds that invest in Mexico and Latin America. Specifically, within days of the devaluation of the Mexican peso by about 15 percent on December 20, all of the closed-end funds that specialize in Mexican equities moved from discounts under 10 percent to premiums of at least 20 percent. In

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1/ The Investment Company Act of 1940 stipulates that an open-end fund must redeem the fund's shares at net asset value on seven day's notice. Closed-end funds can issue additional shares at a price not less than net asset value. In practice, the outstanding shares of closed-end funds change infrequently.

subsequent weeks, these premiums have not dissipated and, indeed, have risen as high as 60 percent for brief periods.

The empirical fact that we study is considerably more general than simply the behavior of a Mexico fund for a particular period of time. Specifically, we show not only that all existing Mexico funds display the puzzling (for the LST hypothesis) behavior, but also that closed-end funds for countries that experienced spillovers from the Mexican crisis displayed similar behavior. In fact, we show that the premiums that developed on closed-end country funds match the degree of the spillover from Mexico: Argentina and Brazil funds developed the largest premiums next to Mexico funds. The LST hypothesis predicts that all U.S.-based country fund discounts should move together--in order for noise-trader risk to be priced, it must be systematic and undiversifiable. We find that the pattern of movement in country fund discounts has much more to it than simply a positive correlation.

Explaining these effects within the noise-trader model seems highly unlikely. When applied to the evidence presented in this paper, the LST hypothesis suggests that investors became (and still are) bullish on emerging markets. Indeed, they are most bullish on Mexico! However, to be fair, the recent evidence is puzzling to many other observers, not just when viewed through the lens of the LST hypothesis. A recent _Wall Street Journal_ article states:

> "A strange thing has been happening with some of the battered country funds. Usually, when a fund is trading at a premium--higher than its actual stockholdings, or the opposite of a discount--it is because the fund is popular and investors are overpaying for it. So why did premiums of many emerging markets funds actually expand despite the collapse of the Mexican peso? It wasn't because these are popular funds all of a sudden." (Power (1995)).

We do not suggest that the LST hypothesis, or indeed any other explanation, is without merit. All of these explanations offer important insights into closed-end fund pricing. Our point is simply that a good deal of work remains to be done on closed-end fund pricing, and the basis for this claim is the recent behavior of country fund discounts. We therefore propose a hypothesis to help understand the evidence we present. Specifically, we show that aversion to losses can go a long way in explaining both the emergence of premia on specific country funds and the cross-sectional dynamics of fund discounts in the wake of the turmoil in emerging markets. We develop a simple model where small investors are loss-averse relative to investors in the underlying assets (as LST argue, institutional investors). Loss-aversion means that the disutility from a $1 loss outweighs the utility from a gain of $1. When NAV falls, individual investors are reluctant to realize losses, even when there is a risk of a further fall in the market. The fact that the country funds that experienced the largest falls in NAV in the wake of the Mexican crisis also developed the largest premiums is precisely the prediction of the loss-aversion hypothesis we present.

The format of the paper is as follows. Section II reviews some of the extant literature on closed-end fund discounts. Section III briefly discusses our data and presents some empirical results. Section IV discusses the empirical stylized facts that we highlight in Section III in the light of the existing explanations of closed-end fund discounts and especially the LST hypothesis. Section V presents an explanation based on loss aversion which is consistent with the empirical facts that we emphasize. The final section summarizes our findings.

## II.  The Pricing of Closed-End Funds

LST review three leading explanations for the existence of discounts on closed-end fund prices: agency costs, taxes, and illiquid securities. The agency costs argument is that the funds are poorly managed given the management fees, and the discount therefore compensates investors for these costs. The tax explanation is that there are significant tax liabilities from the fund's unrealized appreciation; the discount is compensation for this liability. The third explanation is that closed-end funds hold illiquid securities (such as Letter stock), and thus the effective NAV is lower than the notional NAV (i.e., the NAV if the securities were liquid). 1/

LST point out that these three explanations, either individually or collectively, cannot explain what they identify as "the four important pieces to the puzzle:" (i) closed-end funds are issued at a premium of almost 10 percent to cover start-up costs; (ii) they move to a discount of an average of over 10 percent within 120 days after issue and thereafter discounts are the norm; (iii) discounts vary widely across time but seem to revert to the mean; and (iv) when funds are terminated due to liquidation or open-ending the discounts disappear. For our purposes, all three explanations can be rejected as inconsistent with the evidence we present simply on the grounds that they cannot explain premiums in closed-end fund prices. That is, because closed-end funds tend to trade at a discount to NAV on average, these explanations may have some validity in explaining this "steady state" property. But we show that they have no explanatory power for the specific evidence we present in the next section of the paper: these hypotheses cannot explain the emergence of fund premia in the face of unambiguously bad news.

Before discussing further the hypothesis of LST, we mention one other explanation that is particularly relevant in the case of country funds. Specifically, country funds often provide a way to purchase securities in markets that are otherwise very difficult to access--e.g., as in China and Korea. As Hardouvelis et al. (1993) show, this feature alone can create a

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1/ Letter securities are not registered with the Securities and Exchange Commission and hence cannot be traded on the market. They are so known because the purchaser of the initial issue signs a letter of intent stating that the purchase is for investment purposes.

premium (or narrow the discount) for country funds that provide access to restricted markets. Nonetheless, this cannot explain the evidence that we present below.

The LST hypothesis builds on the theoretical work of DeLong, Shleifer, Summers, and Waldmann (1990) (DSSW) and Zweig (1973). As explained briefly above, the idea underlying this hypothesis is that there is a nontrivial fringe of investors who trade based on something other than news. This "noise trading" creates systematic risk in financial markets which can persist for long periods of time. Because this additional source of risk is used by LST to explain the behavior of closed-end fund prices relative to NAV's, it is essential that this "noise-trader risk" be priced. According to LST, closed-end fund discounts or premiums are attributable to variations in the sentiment of small traders.

It is apparent that if the LST hypothesis is going to be able to explain the behavior of closed-end fund discounts/premiums, investors in closed-end fund shares must be different than investors in individual securities, including those that are held in closed-end funds. LST argue (with empirical support for their contention) that most closed-end fund shares are held by individual investors ("small investors") and that institutional investors are important holders of individual securities.

Hardouvelis et al. (1993) make this same argument for country funds. In fact, they argue that the LST hypothesis is likely a more potent explanation for the behavior of country fund discounts/premiums than for closed-end funds that invest only in U.S. securities. Their reasoning is that swings in U.S. investor sentiment may affect both the prices of closed-end funds and those of U.S. securities, but such swings are less important for prices of foreign securities traded on exchanges outside the United States. Thus, they point out that "variation in the discounts of the country funds would, therefore, reflect any differences in sentiment between United States and foreign-based investors, resulting in both more volatility in discounts and greater statistical power" (Hardouvelis et al. (1993, pp. 3-4)). Moreover, they argue that the comovement of country fund discounts probably provides a better measure of U.S. investor sentiment than comovement of U.S. closed-end funds, because U.S. individual investors probably have less access to foreign stock markets than to the domestic (i.e., the United States) stock market.

Hardouvelis et al. examine empirically the predictions of LST's hypothesis for a sample that includes all of the existing country funds. When country funds are separated into those that invest in restricted markets and those that invest in unrestricted capital markets, the restricted-market funds have no significant premium and the unrestricted-market funds have discounts averaging 7 percent. The latter figure is in line with the discounts that LST document for U.S. domestic funds. Second, Hardouvelis et al. find that the noise-trading model goes a long way in explaining the cross-sectional and time-series dynamics of country fund discounts. Most importantly, the intertemporal variation in individual country fund discounts contains an important component that is common to all

funds. This is a central prediction of the noise-trader hypothesis of LST. Third, they find that discounts are mean-reverting, and that in the long run a discount is the norm. These too are consistent with the LST hypothesis. Fourth, the discount does not forecast NAV well, which suggests that the fund price tends to move toward the NAV rather than the converse. Fifth, country fund prices are less responsive to the host country market index and the exchange rate than the NAV. They interpret this as "stickiness;" again this is consistent with the LST hypothesis. Finally, they find that although market segmentation can cause a discount or a premium, it plays no major role in variations in discounts.

## III.  The Recent Behavior of Country Fund Discounts

### 1.  Data

Our sample consists of eleven closed-end country funds: the three existing Mexican funds, three other Latin American country funds (Chile, Brazil, and Argentina), three Asian funds (Indonesia, Malaysia, and Thailand), and (for comparison) two industrial-country funds (Germany and Switzerland). 1/  The data source for weekly NAV and market price data for all of the funds for the period January 1990-March 1995 is Bloomberg Financial Services. 2/  All data are in U.S. dollars.  Table 1 lists some details of these funds.  Of these eleven funds, all but the Argentina Fund are studied by Hardouvelis et al. (1993), so our study complements theirs. Missing values in the original Bloomberg data were updated when possible with data reported in Barron's.

### 2.  Empirical evidence

Figures 1-11 show price, NAV, and the discount for each of the funds over January 1993-March 1994.  The most striking feature of these plots are the large premia (negative discounts) that have developed on each of these funds since December 20, 1994.  Figures 1-3 show that all three Mexican funds turned from modest discounts of 5-10 percent to average premia of 30-40 percent over subsequent months.  In the case of the Emerging Mexico Fund (EMF), premia spiked upwards to 60-70 percent in some weeks.  This feature is all the more striking viewed alongside the fact that these huge premia developed when the value of the underlying assets dropped by large amounts. While an investor directly in Mexican equities might have lost up to

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1/  See Wilson (1992-1993) for a list of existing country funds.

2/  NAV's are calculated at the local market close, and the funds' share price is recorded on the day the NAV was calculated.  The NAV and price data may be slightly asynchronous for two reasons:  (i) funds may use either the exchange rate prevailing at the local market close or an afternoon fix in New York and (ii) foreign markets close before the New York market.  Note that the asynchonization is therefore likely to be smallest for Mexico funds.  Nevertheless, these issues can bias the premium in either direction, and cannot explain the persistent stylized facts that we document below.

Table 1.  Closed-End Country Funds Used in the Study

| Ticker | Fund Name | IPO Date | Net Assets |
|--------|-----------|----------|------------|
| AF | Argentina Fund | 10-11-91 | $108.01 million |
| BZF | Brazil Fund | 3-31-88 | $378.36 million |
| CH | Chile Fund | 9-26-89 | $367.64 million |
| GER | Germany Fund | 7-18-86 | $170.40 million |
| IF | Indonesia Fund | 3-1-90 | $42.32 million |
| MEF | Emerging Mexico Fund | 10-2-90 | $93.01 million |
| MF | Malaysia Fund | 5-8-87 | $180.89 million |
| MXE | Mexico Eq. and Inc. Fund | 8-14-90 | ... |
| MXF | Mexico Fund | 6-3-81 | $559.64 million |
| SWZ | Swiss Helvetia Fund | 8-19-87 | ... |
| TC | Thai Capital Fund | 5-22-90 | ... |

50 percent depending on the holding period, an investor in a Mexico closed-end fund would have experienced much lower losses because the enormous increase in premia worked in the opposite direction to the drop in NAV.  For instance, if a $100 investment in Mexican equities dropped to $50, an investor in a closed-end fund holding the same securities and initially trading at par and later trading at a 50 percent premium would have a portfolio valued in the market at $75, thereby incurring a loss (on paper perhaps) of only one-half of that of the direct position.

Figures 4-6 allow one to study spillovers from the Mexican crisis and the associated dynamics of the country funds for other countries in Latin America (Argentina, Chile and Brazil).  The Argentina and Brazil funds moved from a discount of about 5 percent just before the devaluation to a premium of about 5-10 percent.  The Chile fund, however, shows little systematic movement related to the devaluation.  As discussed more fully below, these observations match closely the degree of spillover from the Mexican crisis.

The gross movements in financial flows and prices surrounding the devaluation prompted fears of "spillovers" to emerging markets around the world.  However, it is well known that spillovers to emerging markets outside of Latin America were limited to very brief periods (less than a week) of higher than normal market volatility.  Figures 7-9, which show data for three Asian emerging markets funds, are consistent with there being limited spillover to Asian markets.  Following the devaluation of the Mexican peso, the Indonesia fund actually traded at a lower premium and the Thai Capital and Malaysia funds traded at larger discounts.

For comparison, Figures 10 and 11 show that there was little relationship in fund premia dynamics for emerging markets and two industrial countries.  Both the Germany and Swiss Helvetia funds maintained the premia that they showed before the devaluation.  Indeed, there seems little variation at all that can be directly ascribed to the events in Mexico in December 1994.

Table 2 and Figures 12 and 13 present additional evidence to support the above arguments.  Table 2 shows average discounts for equal-sized samples before and after the devaluation, and the two figures show the regional behavior of discounts and NAV's around the Mexican devaluation. These are computed for each fund, for Mexican and non-Mexican funds, and by region (Latin American, Asian, and all eleven funds).  These provide clear support for the conclusions drawn from the individual country funds: Mexico funds display the largest increase in their premiums, other Latin American funds were next in line, and Asian funds showed an increase in the premiums of about 1 percent.

In the next section, we return to the various hypotheses that have been advanced to explain closed-end fund discounts, with particular emphasis on the most general of these, the sentiment hypothesis of LST.  We note here that a key feature of the analysis above concerns comovements in country fund discounts.  Specifically, because these discounts are correlated most

Table 2.  Fund Discounts Before and After the Mexican Devaluation

(In percent)

| | Precrisis 1/ | Postcrisis 1/ |
|---|---|---|
| | Country Funds | |
| Mexico (MXF) | 6.74 | -15.99 |
| Mexico (MXE) | 0.02 | -28.91 |
| Mexico (MEF) | 3.82 | -28.46 |
| Argentina (AF) | -1.00 | -6.88577 |
| Brazil (BZF) | 5.84 | -5.43 |
| Chile (CH) | 12.03 | 12.26 |
| Indonesia (IF) | -32.04 | -28.27 |
| Malaysia (MF) | 5.94 | 6.63 |
| Thailand (TC) | 15.03 | 13.37 |
| Germany (GER) | 14.81 | 13.87 |
| Switzerland (SWZ) | 5.12 | 8.18 |
| | (Regions) | |
| All funds | 3.30 | -5.42 |
| All (excluding Mexico) | 3.22 | 1.72 |
| Latin funds | 4.57 | -12.24 |
| Latin (excluding Mexico) | 5.62 | -0.02 |
| Asian funds | -3.69 | -2.76 |
| Mexico funds | 3.53 | -24.45 |

1/ Precrisis and postcrisis means are from equal-sized samples of 15 weeks.  Means for several funds are from equal-weighted portfolios of the funds.

strongly with the events that unfolded in Mexico rather than with each other, do not simply "move together," as they would if a common "sentiment" index was driving them.

## IV. Can Existing Explanations Account for the Recent Behavior of the Discount?

We next review the explanations for closed-end fund discount behavior and present arguments why we believe they do not explain the movements of discounts on Mexican funds around the crisis. First, expected tax liabilities from (unrealized) capital gains are one explanation for discounts. Buying a fund whose price has appreciated means incurring a tax liability even with no outright earnings. However, such effects are unable to explain even the fairly small discounts typical of U.S. funds (see Lee, Shleifer and Thaler (1990)). In the case of premia, it might be argued that an expected capital loss (deductible against gross income) might account for a small premium, but it is hard to imagine that even an anticipated capital loss of 100 percent (say) could explain a 60 percent premium.

Differential taxation of income from the fund (accruing to individual investors) and income from the underlying stocks (accruing to institutional investors) might explain a premium. However, to explain the movement from a discount to a premium around December 1994, one would require a radical change in U.S. tax law around then; we know of no such change. Moreover, special treatment would have to be implied for income for Latin American funds in particular, since we see little comovement in discounts after the crisis except for such funds. This hypothesis is therefore improbable.

The liquidity or market segmentation hypothesis also has little explanatory power in this case. This hypothesis holds that fund shares sell at a discount since the NAV is "overvalued" due to illiquidity of the underlying stocks. In particular, an attempt to unload the stocks in the underlying portfolio would occur transactions costs such that when these are factored into NAV, the latter is equal to the fund's share price. This could explain precrisis discounts on Mexican stocks, because developing-country stock markets like the Bolsa are relatively illiquid by U.S.-market standards. However, for this to explain the postcrisis premia, it would have to be maintained that NAV <u>understated</u> the true value of the underlying portfolio, or that liquidity costs for the underlying portfolio were suddenly 30-40 percent <u>lower</u> than for the fund shares. To maintain this idea is clearly absurd; if anything, liquidity fell on the Bolsa after the crash, so spreads on Mexican stocks trading on the Bolsa should have increased, not decreased, after the crisis.

Another hypothesis is that agency costs account for discounts. Discounts might reflect management fees, or a tendency for fund managers to underperform the market. For this to explain <u>premia</u> suddenly appearing around the time of the crisis, managers of Mexican funds would have either had to have started charging <u>negative</u> fees (paying fund shareholders for the right to manage the fund), or shareholders would have had to change from

expecting managers to underperform to expecting them to greatly outperform the market. Neither is plausible.

Recall that Lee, Shleifer and Thaler's (1991) sentiment hypothesis focusses on individual investors' systematic, persistent swings in sentiment. Pessimism drives fund prices down, while optimism drives them up. If such sentiment affects the prices of many funds, holding a broad array of such funds cannot cause sentiment fluctuations to "cancel out;" the risk posed by sentiment swings is systematic. They support their contention with an array of empirical evidence, including significant correlations among discounts on funds. 1/ Moreover, they contend that the sentiment hypothesis is also consistent with the observation that initial public offerings for closed-end funds tend to be clustered during periods of time when existing funds display premiums--i.e., when investors are optimistic and will pay a premium for fund shares.

In addressing the evidence presented in this paper, the LST hypothesis runs into two fatal difficulties. First, the swing in fund discounts for Mexico is not reflected in swings in other funds' discounts--hence, it is not systematic. Some might argue that there is a separate "Mexico sentiment" that is specific to that country's stock market; if so, it is not in evidence before the crisis. Moreover, moving in that direction is tantamount to a reduction ad absurdum argument: assigning a separate "sentiment" influence to each fund (or asset!) could trivially explain any movement in all discounts (assets). Finally, it is hard to imagine that sentiment fluctuations that affect only three funds out of a constellation of many are systematic. If not, there is no clear reason why we should care about such fluctuations.

A second difficulty is that in order to explain a movement from a discount to a premium at the time of the devaluation, the events surrounding the devaluation would have to be interpreted as good news, not bad--the premium would have to reflect investor optimism. Even observers in Mexico did not interpret events in that light, though. Examining the behavior of discounts around the ratification of NAFTA by the U.S. Congress in December 1993 sheds some light on this notion. Certainly this event is unambiguously positive for the outlook for Mexican stocks, and more so than the devaluation, but we do not see premia of postcrisis magnitude in data for early 1994. Further, according to the LST hypothesis, one would expect to see a flurry of initial public offerings of country funds (especially Mexico funds) subsequent to the devaluation. However, press reports contradict this expectation:

> "Initial public offerings have dried up; there was only one closed-end IPO in the entire first quarter and that was the hybrid-like Eaton Vance Classic Senior Floating-Rate Fund, which some people don't consider a real closed-end fund anyway." (Power (1995))

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1/ As noted earlier, much of their work is reproduced for emerging-markets funds by Hardouvelis et al. (1993).

Clearly an alternative explanation is required to account for the evidence we have presented in this paper. In the next section, we sketch an idea that we believe accounts for it. The idea is related to the loss-aversion hypothesis of Benartzi and Thaler (1995) and the disposition effect discussed by Ferris, Haugen, and Makhija (1988). Since our goal in this paper is primarily to document the puzzle, and a detailed explanation would take us far afield from careful documentation of the facts, we leave a formal model for separate work.

## V.  Loss Aversion as an Explanation

A rich literature in the microeconomics of finance has sought to explain the deviation of the behavior of financial-markets participants from the predictions of classical financial theory. By the tenets of classical financial theory, with rational participants and frictionless markets, NAV and price for closed-end funds should be identical. As LST point out, modifications that are static in nature (such as taxes and agency costs) might explain discounts, but are hard-pressed to explain premia and cannot account for large variations in discounts over short periods of time. It may be that the shortcomings are not in the nature of markets, however, but in our modeling of financial-markets participants' objectives.

Benartzi and Thaler (1995) find that a model of loss-aversion can explain the equity premium puzzle--the high average returns on stocks versus a risk-free asset, even after adjustment for stock-market risk. Loss-aversion means that an infinitesimal marginal loss hurts an investor more than an equal-sized gain helps (in terms of utility). More formally, the utility function is defined over changes in wealth, with a kink at the origin (no change in wealth). The slope over losses in wealth, and hence the marginal disutility of a loss, is greater than the slope over gains in wealth. This fear of losses can lead agents to display an asymmetric distaste for downside risk, more so than would be given by a typical utility function. In Benartzi and Thaler, it leads to a higher premium on a risky asset versus riskless one.

We believe that the loss-aversion explanation is consistent with the evidence for Mexican mutual funds. Specifically, swings in NAV should show asymmetric effects on discounts; upswings should show smaller changes in price relative to NAV than downswings. In particular, shareholders should be relatively unwilling to sell on downswings (and bad news) relative to upswings (and good news). Fears of realizing losses could lead investors to lengthen the time between portfolio evaluations when they perceive a shift in the probability of losses. Their unwillingness to sell means, in our view, that their views about the value of their shares are not impounded in price. Hence, we believe loss-aversion can induce a kind of "downward stickiness" in share prices that gives rise to the large observed discounts. Indeed, movement of prices seems smooth relative to movements in NAV in our figures, supporting this notion.

This discussion falls far short of an analytical theory of the determination of fund discounts, though. In a companion paper we put some more meat on the analytical bones of the ideas sketched out here.

## VI.  Conclusion

Many studies have attempted to reconcile the behavior of closed-end fund prices with notions about the behavior of investors. Such studies have appealed to frictions (taxes, agency costs, and illiquidity) and investor sentiment to explain the puzzling behavior of fund prices. The events of December 1994 in Mexico, and subsequent effects on some funds' prices, has given rise to a new puzzle, extreme premia on closed-end funds that invest in Mexican stocks. We believe this new puzzle is not amenable to explanation by extant hypotheses. We offer a hypothesis of loss-aversion on the part of individual investors as a possible explanation, and outline the relevant effects that loss-aversion should have on fund discounts. More detailed analysis in the context of a formal model awaits further research by us.

# Figure 1: Mexico Fund (MXF)



_____ Price      ........ NAV      _ _ _ Discount
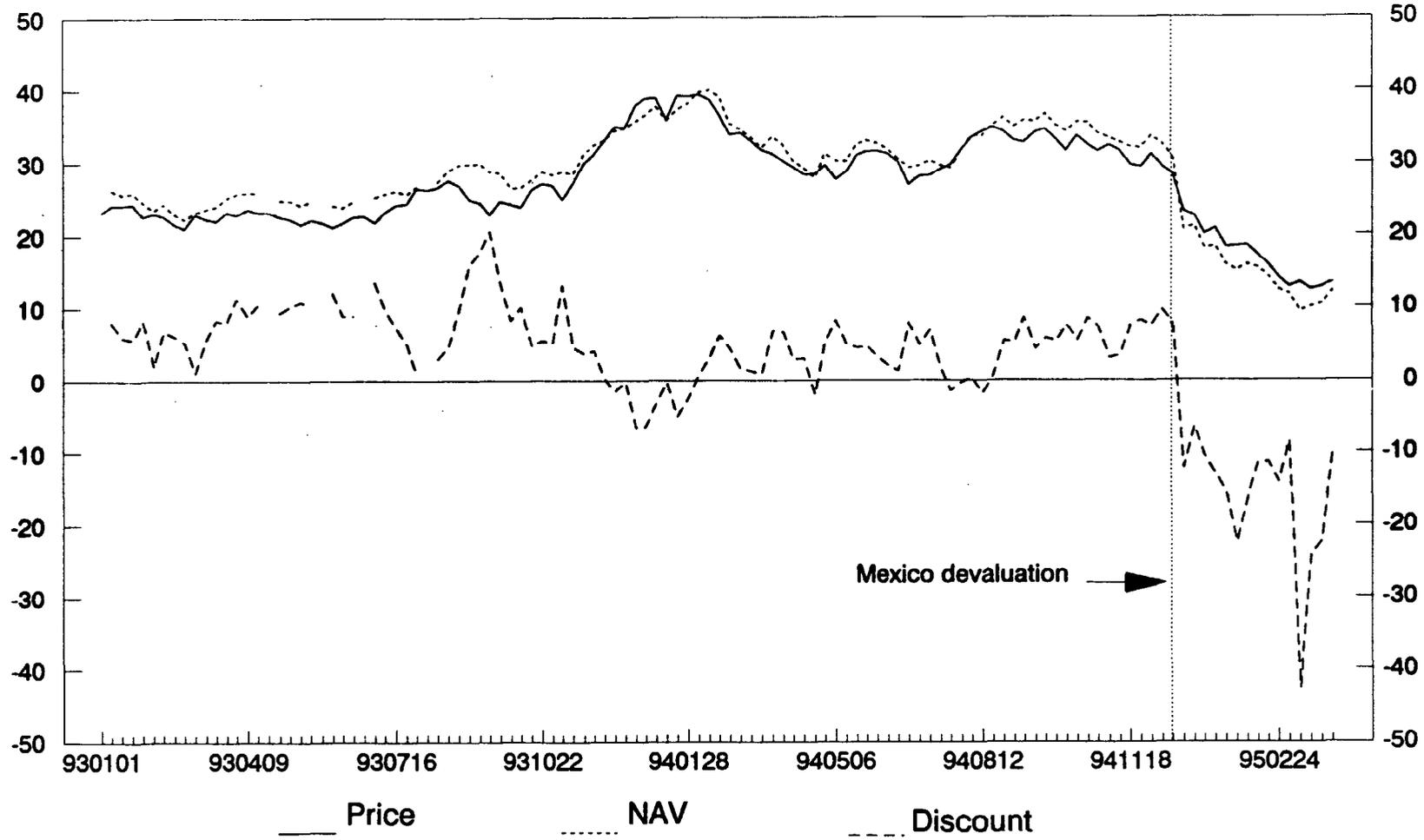
Figure 2: Mexico Equity and Income Fund (MXE)
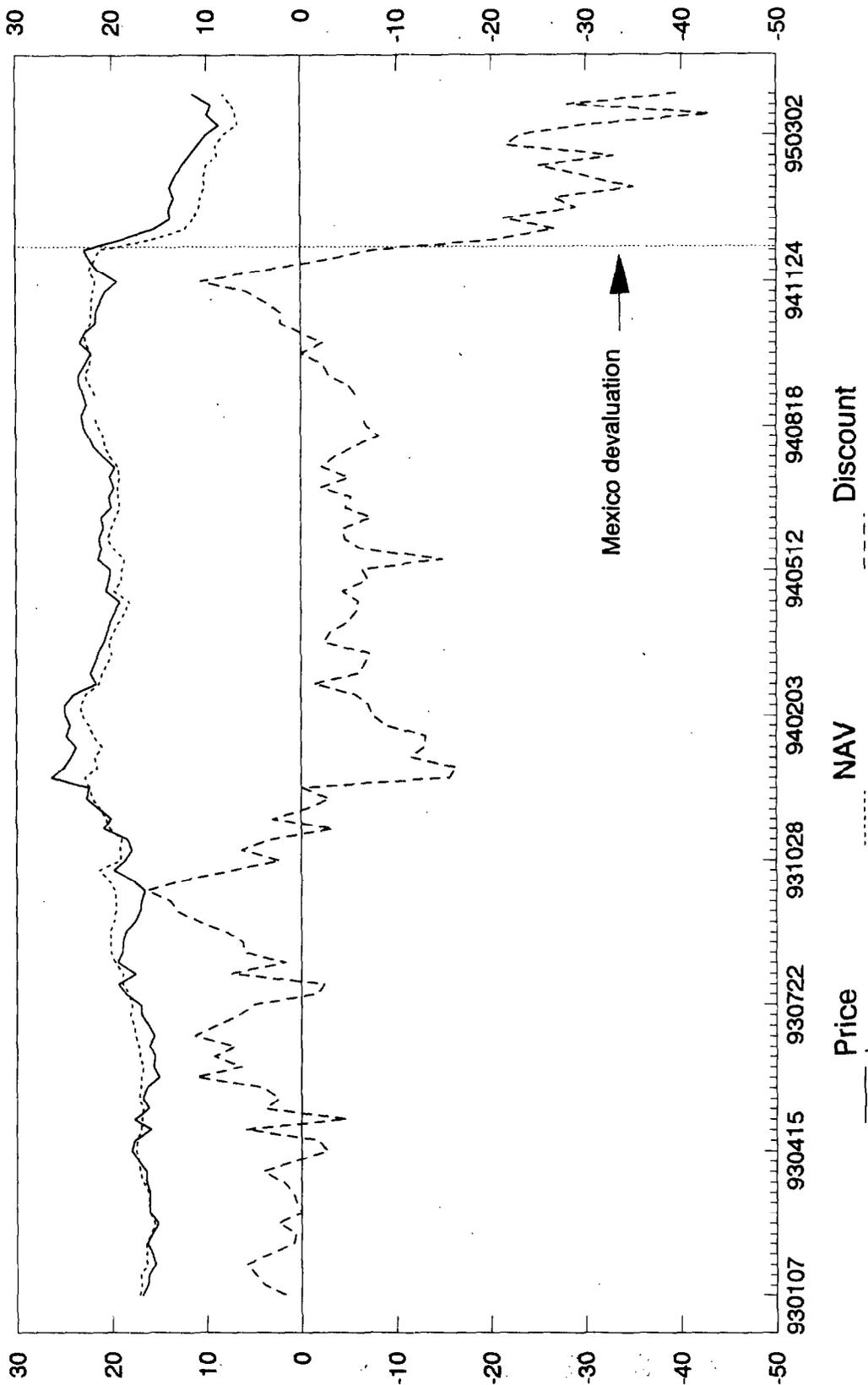
# Figure 3: Emerging Mexico Fund (MEF)



Mexico devaluation ➤

___ Price     ....... NAV     ----- Discount
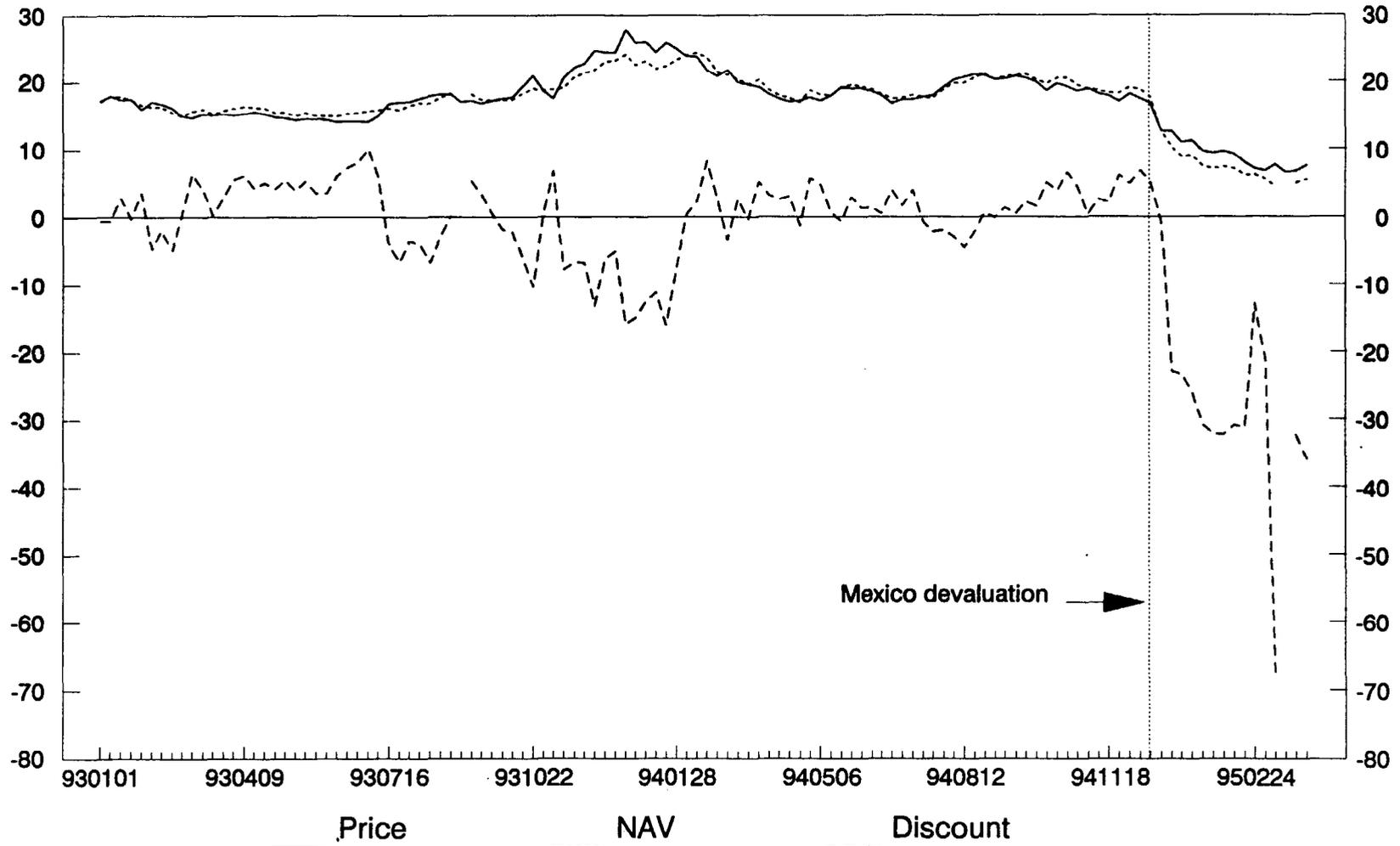
Figure 4: Argentina Fund (AF)
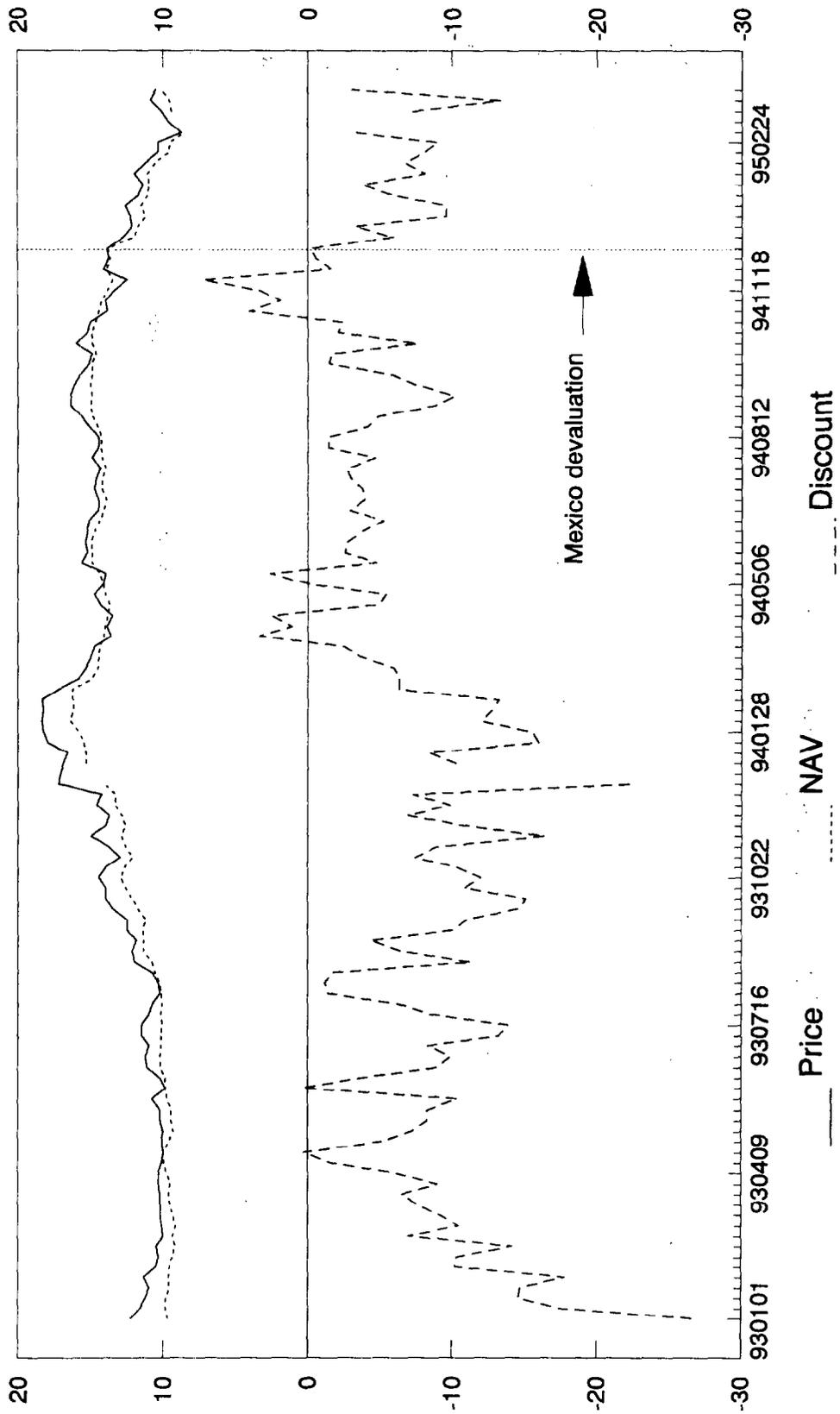
Figure 5: Brazil Fund (BZF)
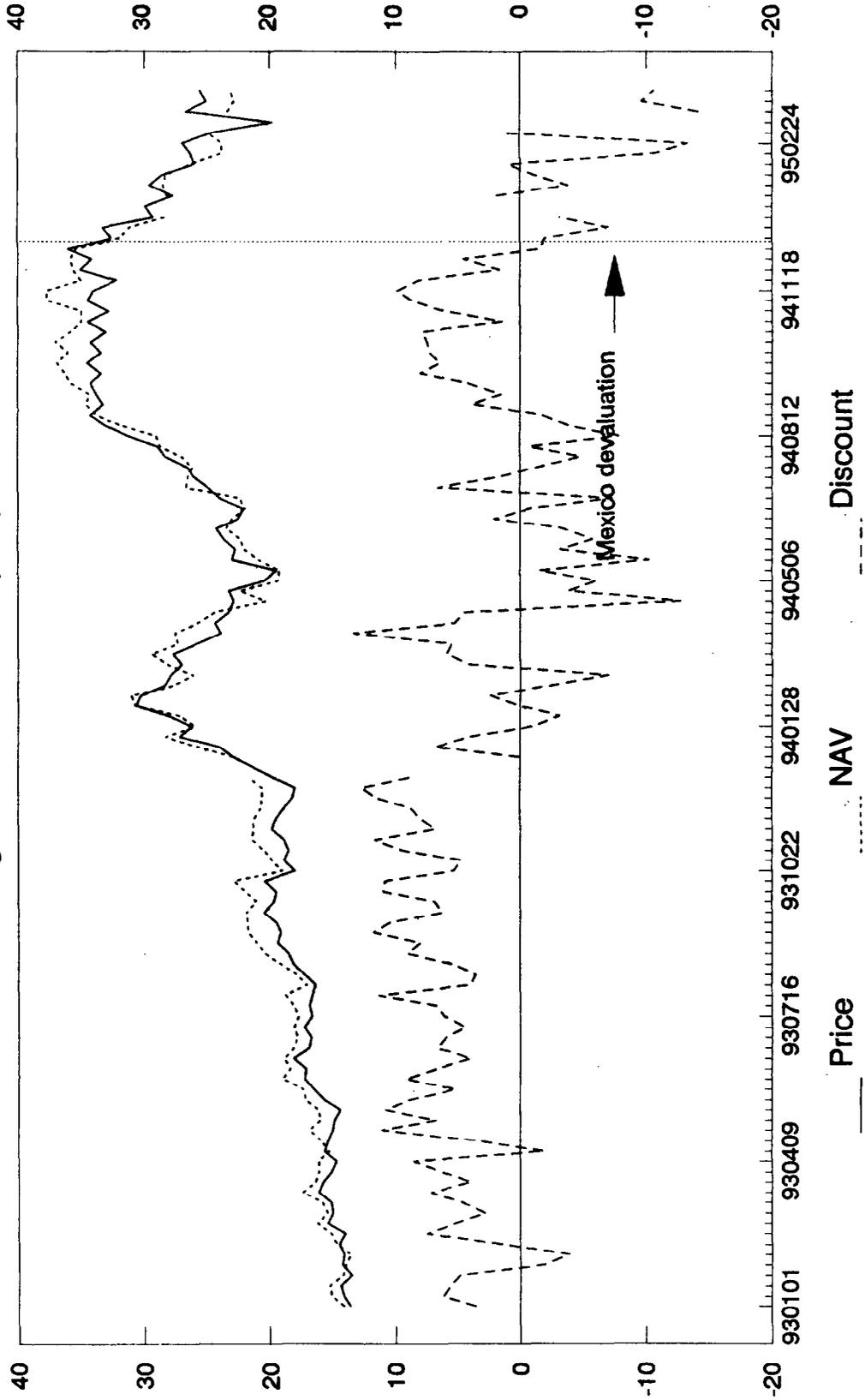
# Figure 6: Chile Fund (CH)



Price ......... NAV _ _ _ Discount
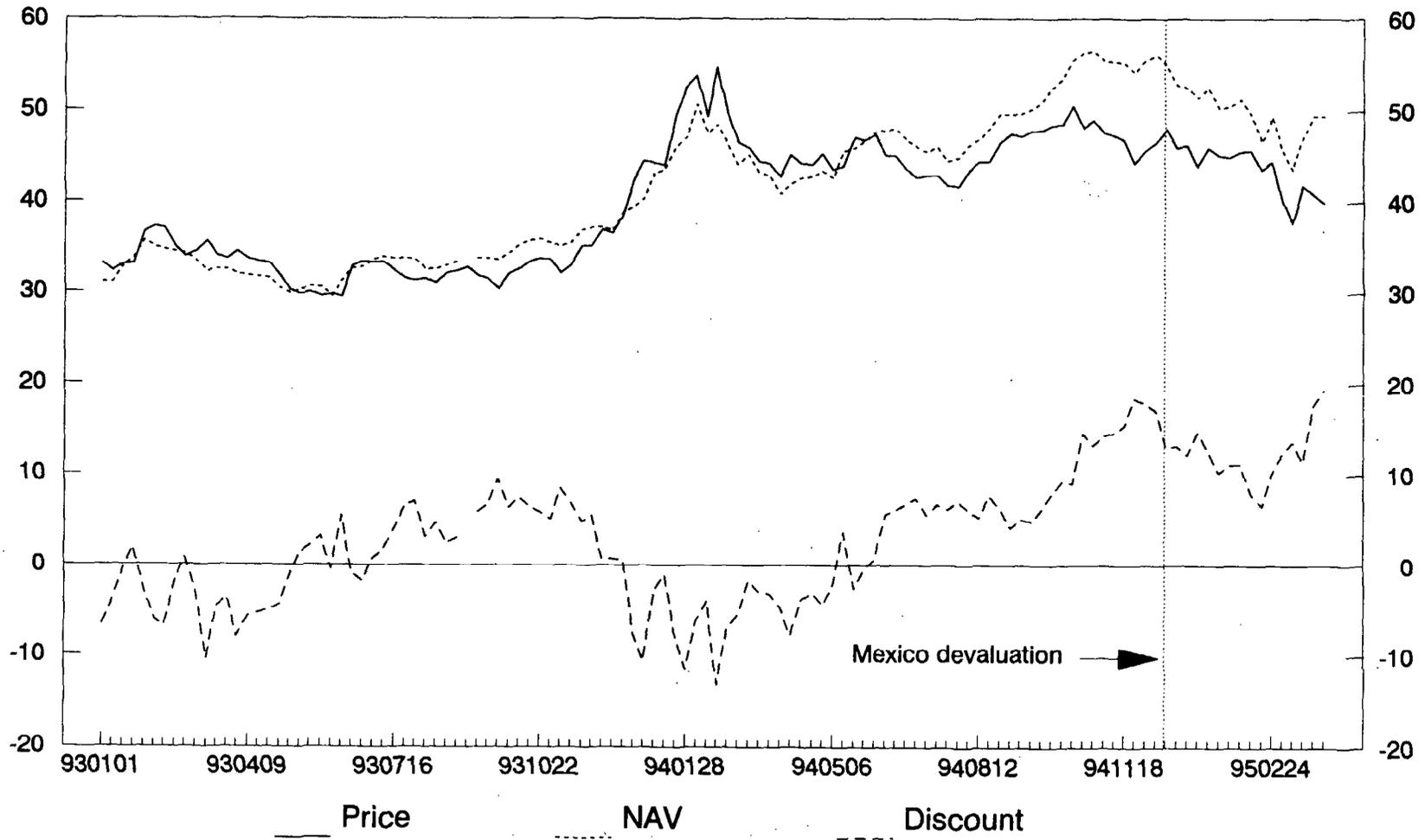
# Figure 7: Indonesia Fund (IF)



_____ Price    ........ NAV    _ _ _ _ Discount
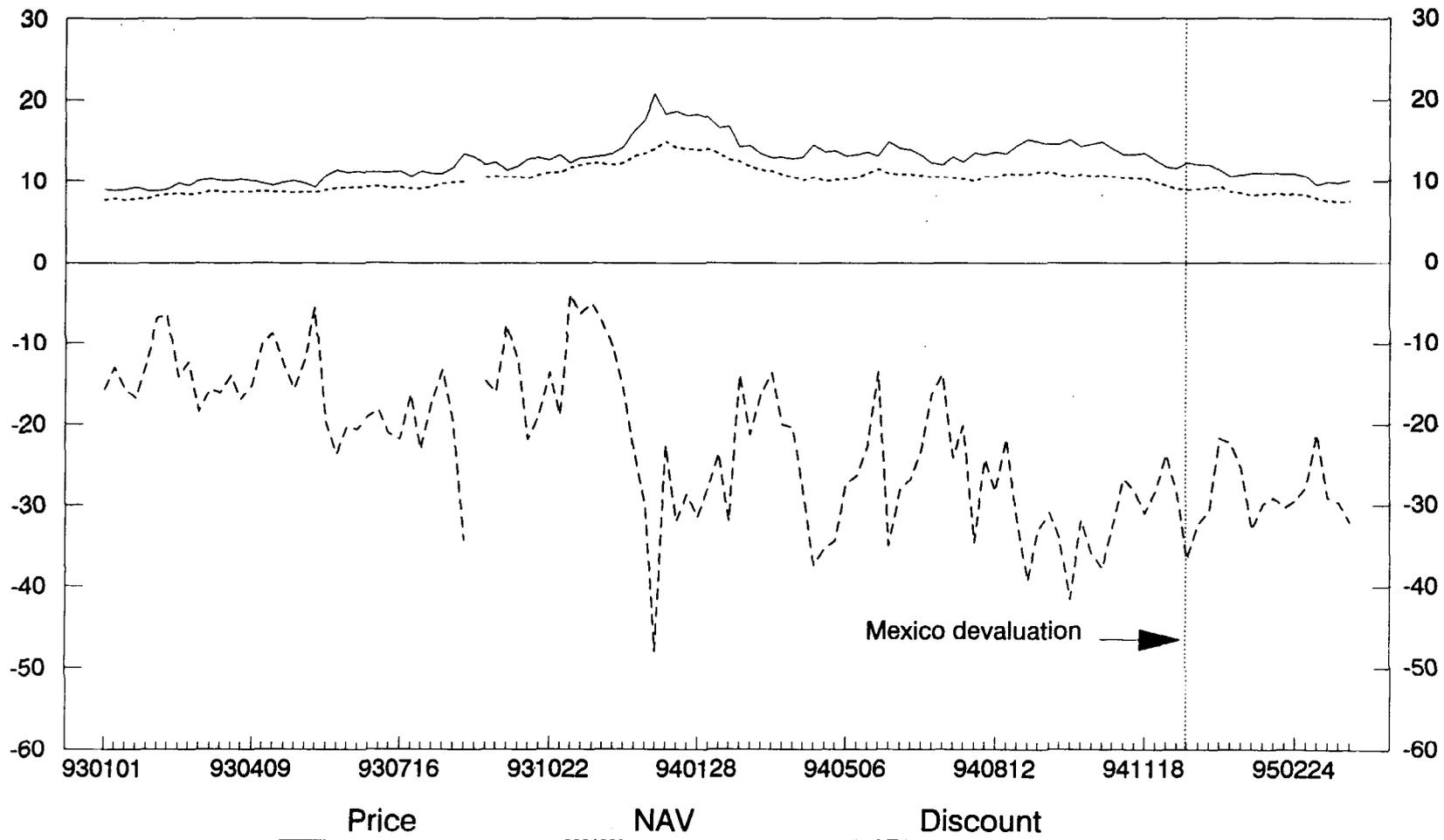
Figure 8: Thai Capital Fund (TC)
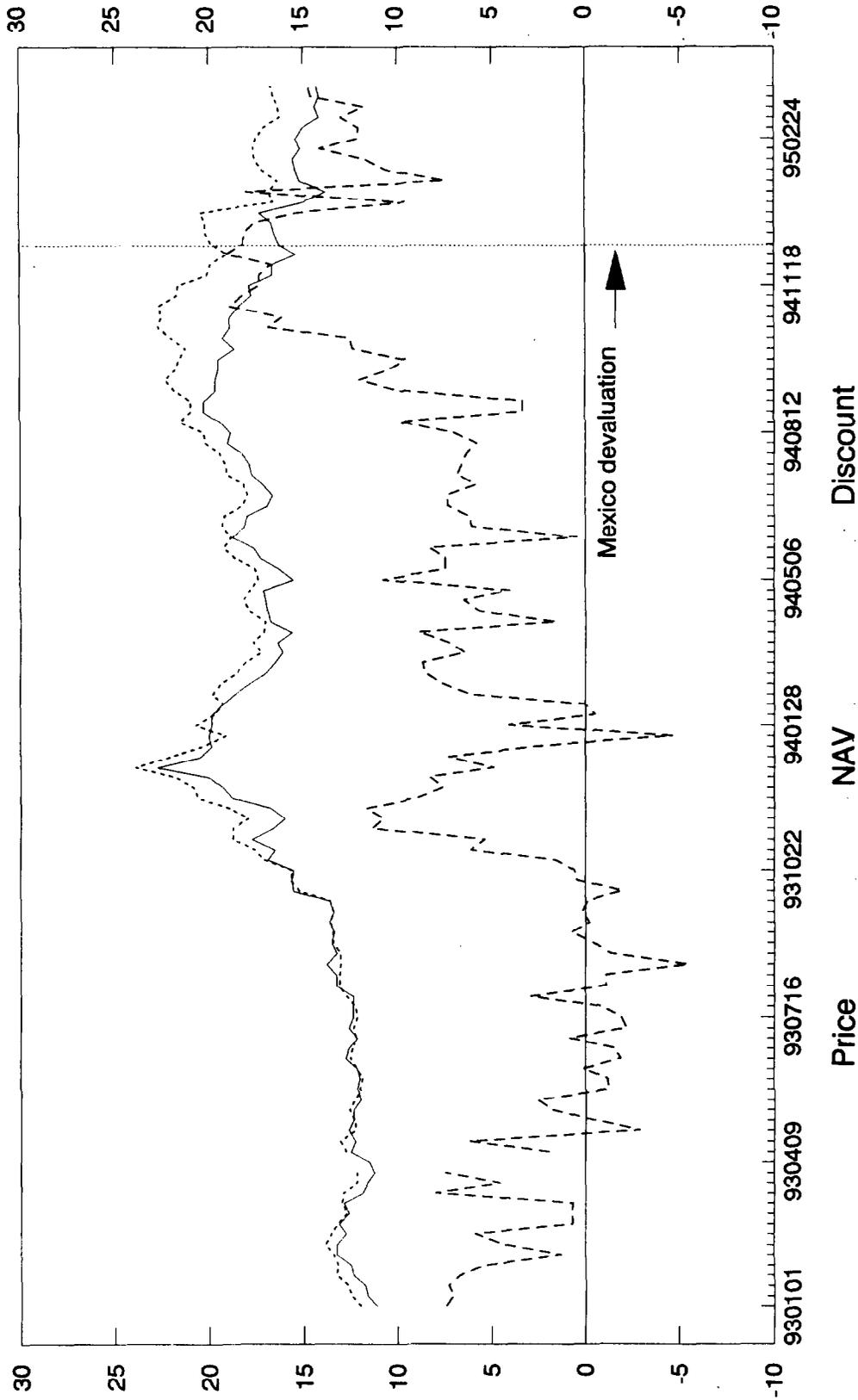
Figure 9: Malaysia Fund (MF)
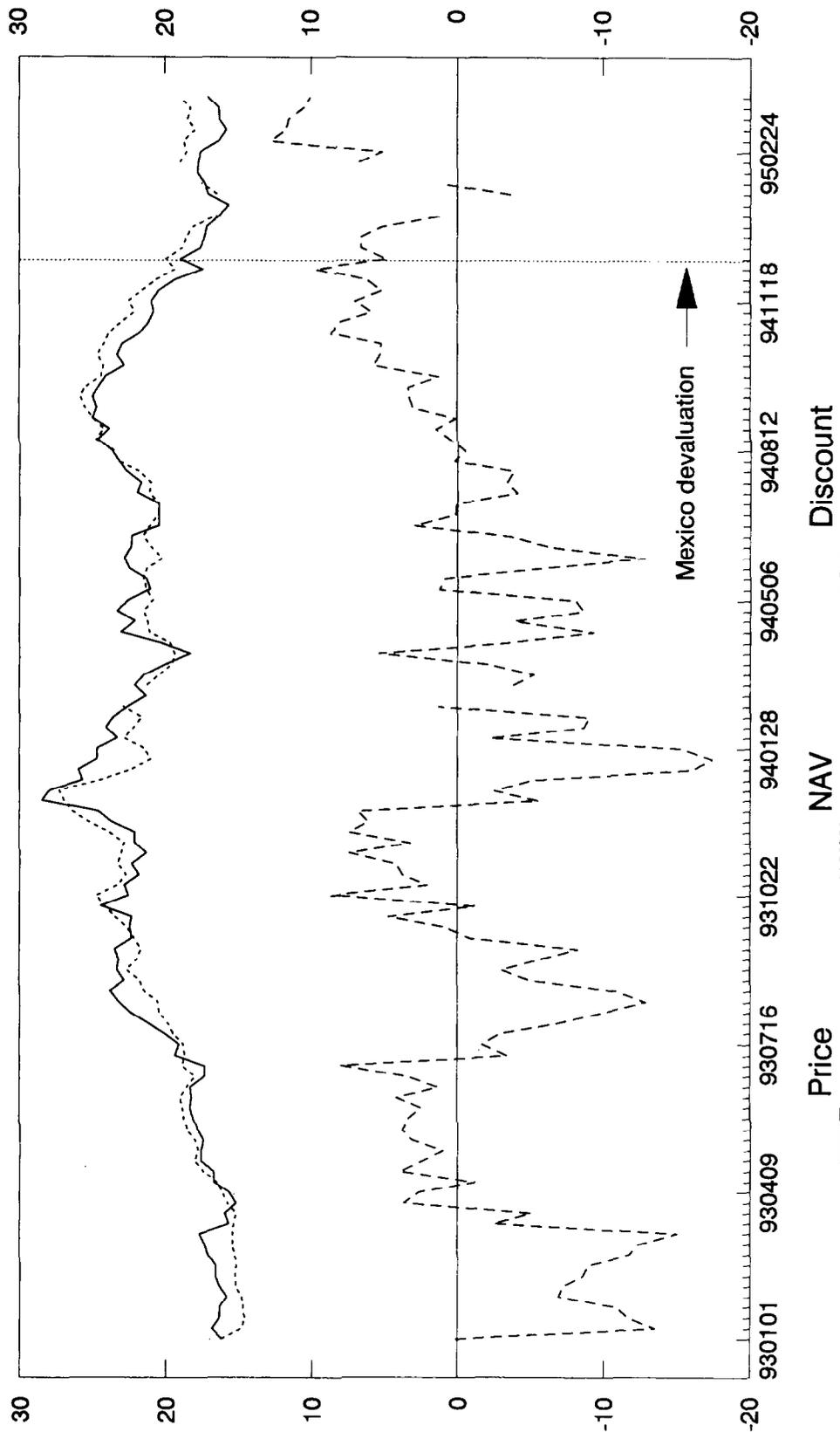
Figure 10: Swiss Helvetia Fund (SWZ)
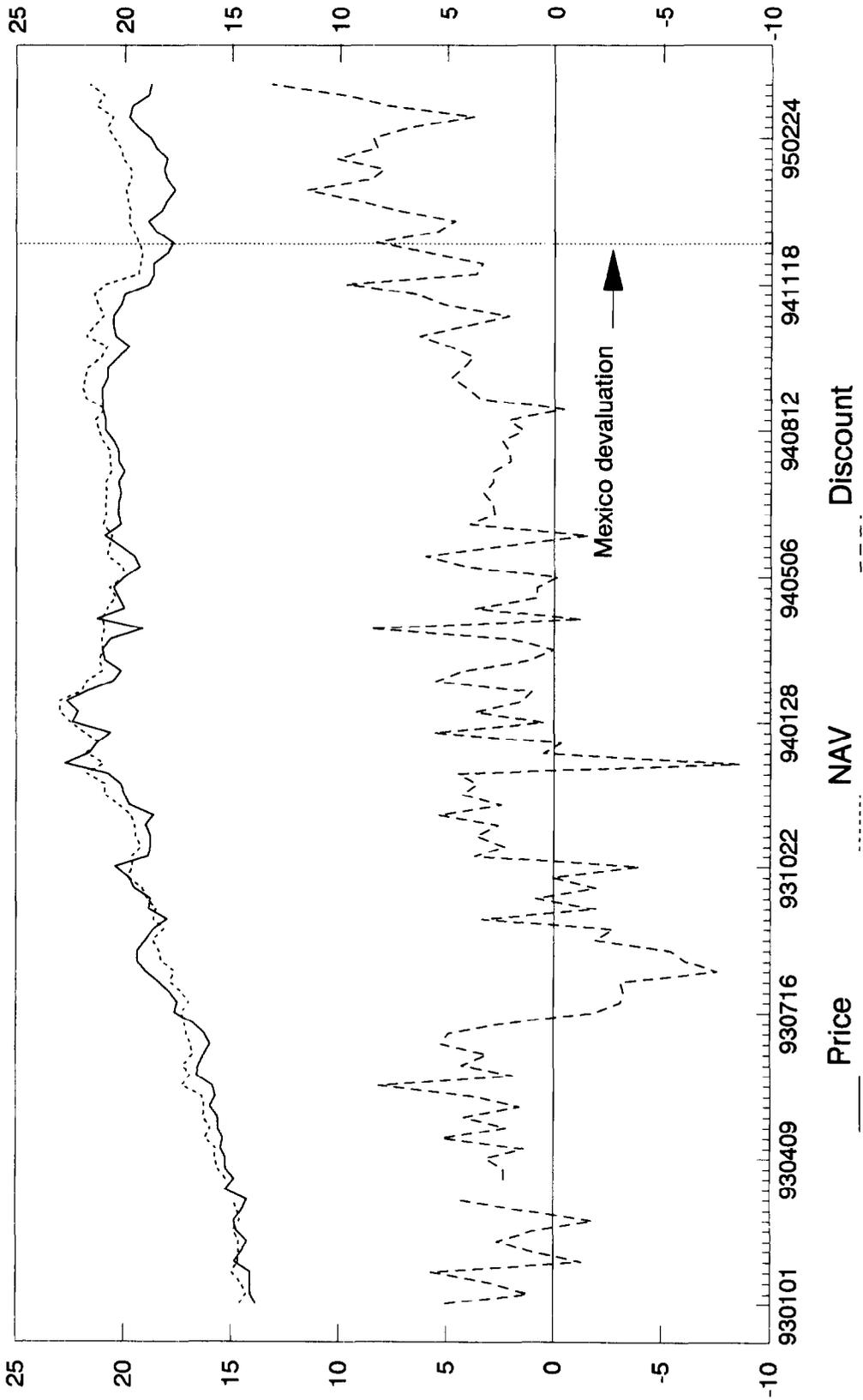
Figure 11: Germany Fund (GER)
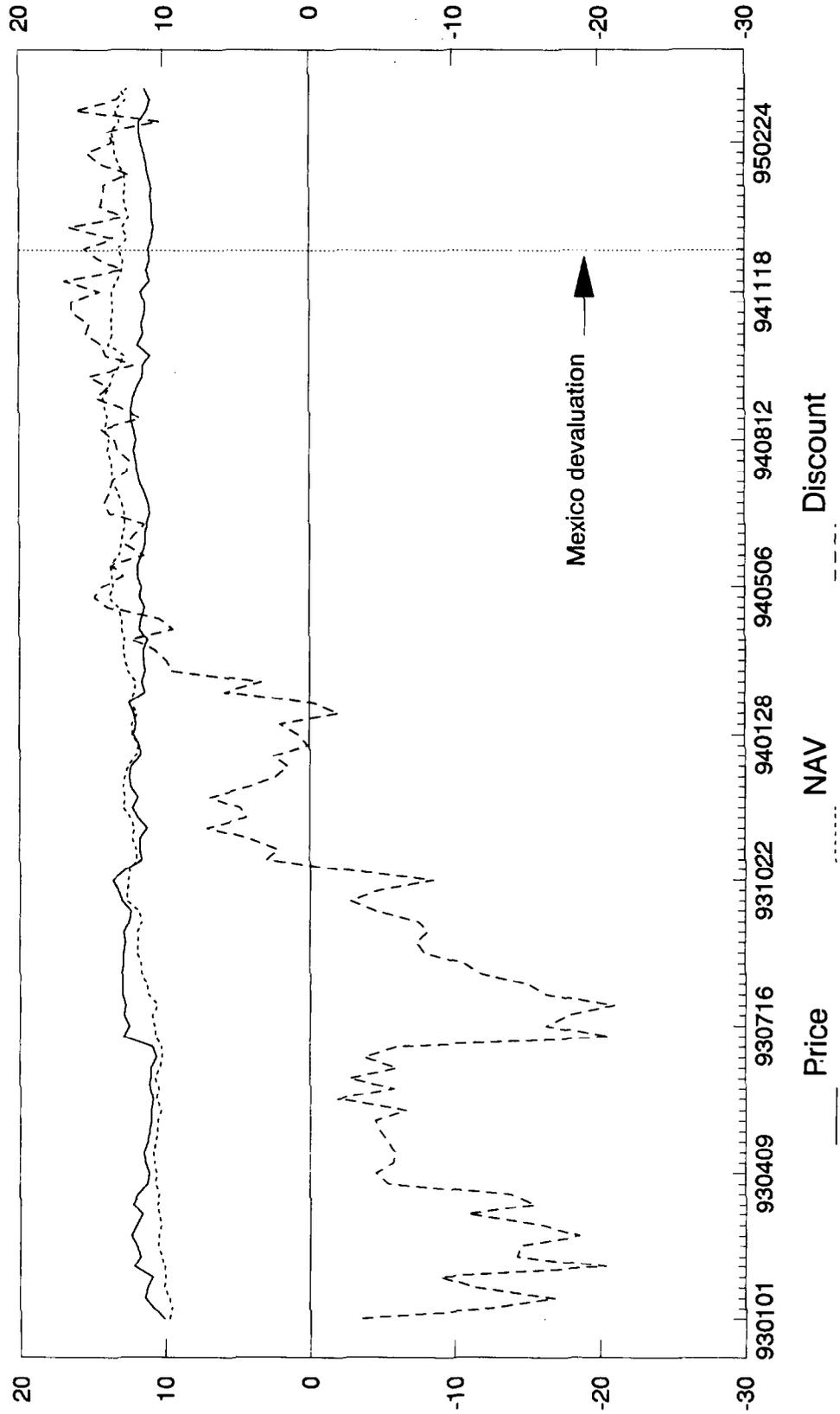
# Figure 12: Regional Co-movement of Fund Discounts Around the Mexican Devaluation



Mexico funds

all funds

Asian funds

Lat. Amer. funds (excl. Mexico)
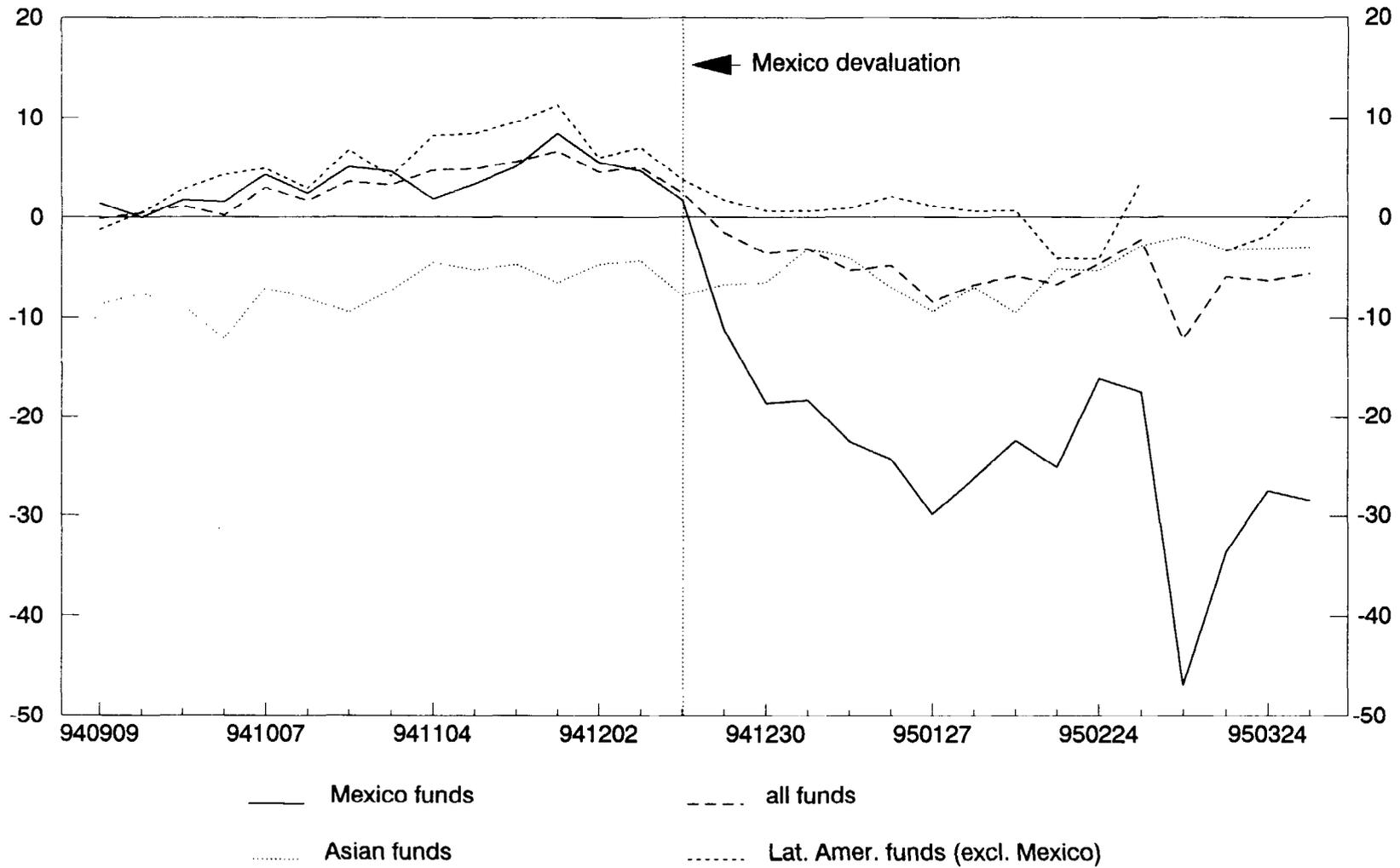
# Figure 13: Behavior of Fund Net Asset Values Around the Mexican Devaluation



Mexico devaluation

Legend:
—— Mexico funds
– – – all funds
·········· Asian funds
········ Lat. Amer. funds (excl. Mexico)
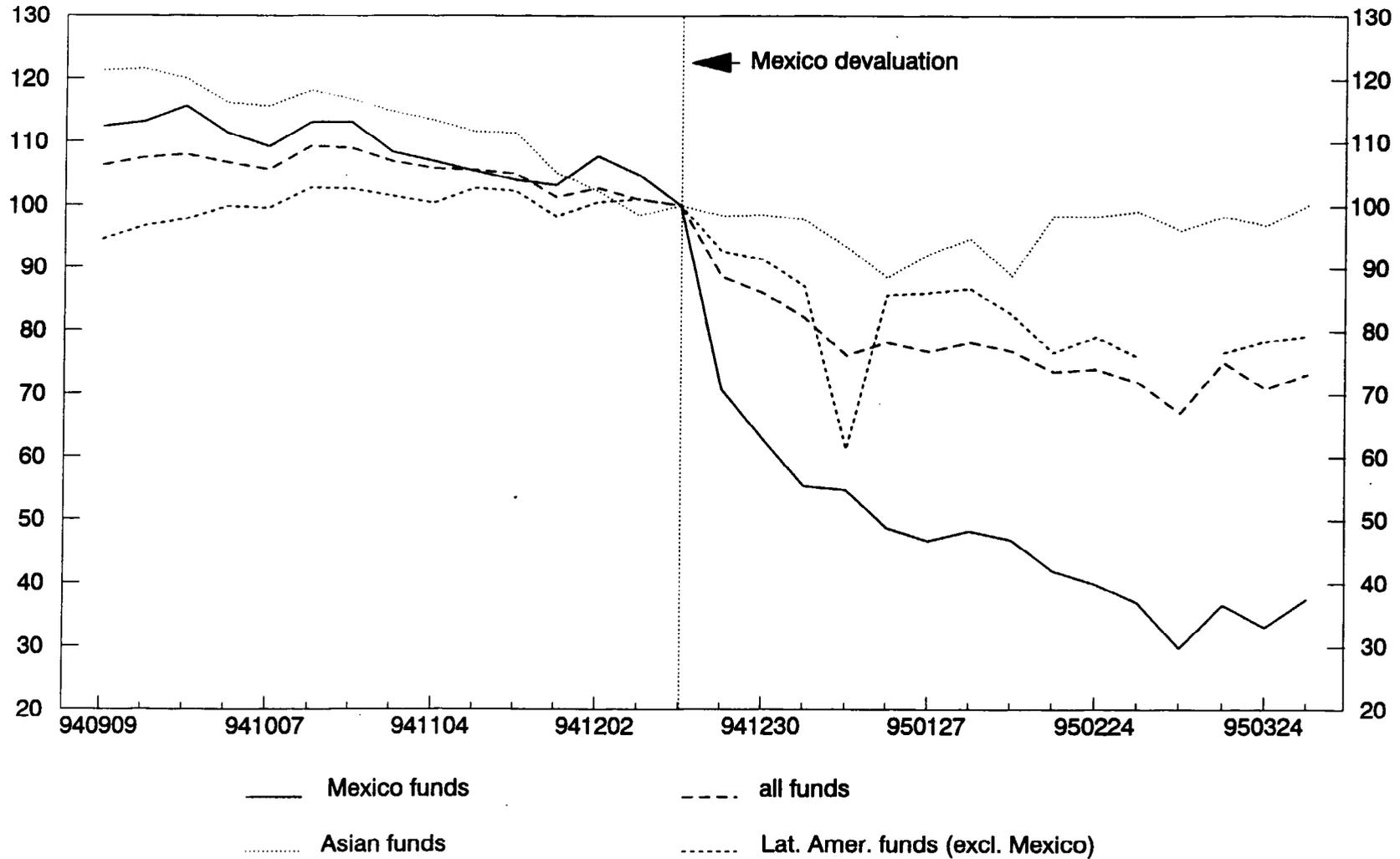
Notes: NAV's have been re-scaled so that they are equal to 100 at the
time of the Mexican devaluation.

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