

AN ABSTRACT OF THE THESIS OF

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The purpose of this study is to develop an analytical framework for identifying and evaluating conditions that precipitate currency devaluation like those experienced by Mexico in 1994.

This study develops a framework of financial and macroenvironmental indicators that point to potential currency devaluation in the future. Some of these indicators are: the level of interest rates, Balance of Payments information, the general political environment, and the timeliness of governmental information releases. The framework will rely on international parity conditions, Balance of Payments relationships, and political events to link the indicators to predictions of currency devaluation. The framework will be applied to the currency crisis of Mexico in 1994 to serve as an example.

Conditions Precipitating Currency Devaluation:
An Analysis of the 1994 Mexican Financial Crisis

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CONDITIONS PRECIPITATING CURRENCY DEVALUATION:
AN ANALYSIS OF THE 1994 MEXICAN FINANCIAL CRISIS

CHAPTER I:
INTRODUCTION

The purpose of this study is to develop an analytical framework for identifying and evaluating conditions that precipitate currency devaluation like those experienced by Mexico in 1994.

This study develops a framework of financial and macroenvironmental indicators that point to potential currency devaluation in the future. Some of these indicators are: the level of interest rates, Balance of Payments information, the general political environment, and the timeliness of governmental information releases. The framework will rely on international parity conditions, Balance of Payments relationships, and political events to link the indicators to predictions of currency devaluation. The framework will be applied to the currency crisis of Mexico in 1994 to serve as an example.

CHAPTER II: ANALYTICAL FRAMEWORK

This section will develop the basis for examining and isolating the critical factors that affect exchange rates. An analysis of parity conditions and economic fundamentals help identify the root causes of currency devaluation.

Parity Conditions

The core of currency valuation is formed around the relationships between interest rates, exchange rates, and forward rates.

The Fisher Effect

The first portion of this study focuses on interest rates and how they relate to exchange rates. The principal theory cited is that of the Fisher Effect, in which "nominal interest rates in each country are equal to the required real rate of return plus compensation for expected inflation." (Eiteman, 1995) Figure I shows this relationship with the Mexican peso and the US dollar:

$$i^{NS} = (1 + r^{NS})(1 + \pi^{NS}); i^{US} = (1 + r^{US})(1 + \pi^{US})$$

Where: N\$ = Mexico
 US\$ = United States
 i = nominal interest rate
 r = real rate
 π = inflation rate

Figure I: The Fisher Effect

The International Fisher Effect

The underlying concept of the International Fisher Effect states that: "the spot exchange rate should change in an equal amount, but in the opposite direction to, the difference in interest rates between the two countries." (Eiteman, 1995) Figure

II illustrates this concept:

$$\frac{E(S)}{S} = \frac{(1 + i^{N\$})}{(1 + i^{US\$})}$$

Where: N\$ = Mexico
 US\$ = United States
i = national interest rates
 E(S) = expected future spot exchange rate (N\$/ $\text{\$}$)
 S = current spot exchange rate (N\$/ $\text{\$}$)

Figure II: The International Fisher Effect

This relationship implies that an investor would be indifferent to investing in pesos or dollars, given no restrictions on capital flow since real rates of return are equal. However, this model fails to consider any exchange risk premium for a particular currency--altering the parity between changes in exchange rates and differences in interest rates. (Eiteman, 1995)

Interest Rate Parity

The theory of interest rate parity links "differences between spot and forward exchange rates, at a point in time, to differences in nominal interest rates in the two countries." (Eaker, 1996) Founded on principles relating to the International Fisher Effect, the time frame of this theory is limited to securities of not more than one year. (Eiteman, 1995) The relationship of interest rate parity is found in Figure III.

$$\frac{F}{S} = \frac{(1 + i^{N\$})}{(1 + i^{US\$})}$$

Where: N\$ = Mexico
 US\$ = United States
i = national interest rates
 S = spot exchange rate (N\$/ $\text{\$}$)
 F = forward rate (N\$/ $\text{\$}$)

Figure III: Interest Rate Parity

Summary on Parity Conditions

Though the models discussed thus far have theoretical limitations, they serve as a basis for analyzing conditions that affect currency valuation. For instance, the forward rate discussed under the interest rate parity relationship is a relatively accurate forecast of future spot rates.

The Balance of Payments Analysis

The system for measuring all of the economic transactions of one country with the rest of the world forms the accounting system known as a country's balance of payments. A description of how each of the accounts within the balance of payments affects relative currency value follows.

Current Account Balance

The balance on the current account is one of the most frequently cited measurements of a country's economic policy. The current account states the net amount of income from merchandise, income, services, and unrequited transfers. (Eiteman, 1995).

Aside from measuring the level of exports of goods and services, the current account balance also specifically measures investment income. The most useful application of the current account information centers on relating the information to the performance of the economy. (Eaker, 1996). The illustration of this concept is found in Figure IV below.

$$Y - (C + I + G) = X - M$$

Where: Y = GNP

C = private sector consumption

I = private sector domestic investment

G = government sector spending

X = exports of goods and services

M = imports of goods and services

Figure IV: GNP & Current Account Relationship

GNP, (Y), measures the total output of the economy, (C + I + G) measures private and public sector expenditures, and (X - M) indicates the current account balance. (Eaker, 1996) Thus, when a nation runs a current account deficit, its GNP is smaller than its expenditures. To compensate or absorb the goods and services beyond what the nation produces, the deficit nation must borrow from other countries. (Eaker, 1996)

Capital Account

The capital account measures short and long-term flows: bank loans, trade credit, and long-term investments in foreign stock. (Eaker, 1996) Essentially, the capital account balances reflect the investment activities of the private sector.

The capital account balance plays a critical role under the Balance of Payments framework. Capital movements reflect the investor's search for higher rates of return at comparable levels of risk. (Eaker, 1996) Private sector investors base investment decisions on a number of factors: current interest rates, the state of the economy, political risk, and expectations regarding future exchange rates. (Eaker, 1996)

Capital is divided into two primary categories: long and short-term. Long-term investments, namely direct foreign investment (DFI), result from favorable expectations concerning business and economic climates that will provide long-run stability and growth. (Eiteman, 1995) Short-term capital flows arise as expanding companies require added financing--driving up real rates of interest due to increasing demand. Higher interest rates thus draw investors from abroad seeking higher returns. (Eaker, 1996)

The Official Reserves Balance

Also referred to as the reserve account, the account measures the changes in the monetary reserves, Special Drawing Rights (credit by the International Monetary Fund), gold, and convertible securities.

Changes in a government's reserve balance reflect the net change in the government's holdings of foreign exchange. Reserves are used to "service outstanding obligations, or intervene in the exchange markets for the purpose of setting or controlling the exchange rate." (Eaker, 1996) For instance, if the supply of Mexican pesos increases, the government can take action to preserve the peso's value. The government can intervene in the foreign exchange market by buying pesos with US\$ reserves, as long as it has dollar reserves to sell.

Implications of Imbalances in the Balance of Payments

Depending on the exchange rate system used by a country, the significance of account balances within the BOP framework have different meanings. For instance, under a fixed exchange rate system, the government can reduce official foreign exchange reserves to compensate for current/capital account deficits. Thus, since capital and current account deficits reflect an excess supply of a country's currency, the government must use reserve balances (or borrow from abroad) to buy domestic currency to reduce the deficit. (Eiteman, 1995) If reserves become depleted, the country is unable to purchase currency and is forced to devalue.

The managed float attempts to modify exchange rates by influencing market activities. A government increase in interest rates aims to attract foreign capital and defend the value of its currency. Increased interest rates create additional domestic

demand for short-term capital, raising the cost of borrowing.

Economic Implications of Balance of Payments Data

Interpretation of BOP data necessitates identifying the manner in which funds are utilized, placing them in the context of domestic and international investment conditions. General interest rate levels and availability of external financing worldwide can increase or decrease the severity of a nation's deficit or ability to finance debt.

With a current account deficit, the country "must finance that deficit by increasing its obligations to other nations or by reducing its claims on other nations." (Eaker, 1996) In other words, the deficit nation requires foreign inflows to support spending.

Thus, deficits can result from a country's inability to finance growth. External borrowing may be a necessary means to achieve the desired economic expansion. If foreign investment and/or external borrowing used to finance expansion does not produce sufficient means to repay borrowing, the country may suffer economically.

Political Risk

Political risk is defined as "the exposure to a change in the value of an investment or cash position because of government actions or other nonmarket events that are political in nature." (Eaker, 1996) Though difficult to quantify, identifying variables that comprise political risk provides a framework for analyzing the effects of changes in the political environment. Table I shows the indices developed by Haendel known as the Political System Stability Indices (PSSI). (Haendel, 1979)

Table I: Political System Stability Indices (Haendel, 1979)

Socioeconomic Index
Ethnolinguistic fractionalism
GNP growth per capita
Energy consumption per capita
Societal Conflict Index
Public unrest index
Riots
Demonstrations
Government crises
Internal Violence Subindex
Armed attacks
Assassinations
Coups d'etat
Guerilla warfare
Coercion Potential Subindex
Internal security forces per 1,000 population
Governmental Processes Index
Political competition index
Legislative effectiveness
Constitutional chief executive changes
Irregular chief executive changes

The International Country Risk Guide has also created a system for assessing political risk indicators, see Table II. Under this 10-point system, each category is assigned a number, with higher numbers implying less risk.

Table II: International Country Risk Guide

Economic expectations vs. realities
Economic planning failures
Political leadership
External conflict risk
Corruption in government
Military in politics
Organized religion in politics
Law and order tradition
Racial and nationality tensions
Political terrorism
Civil war risks
Political party development
Quality of bureaucracy

The analysis of political risk in this study will center on examining major events within the political environment that have impacted economic stability. Political risk factors and their effect on capital flows and nominal interest rates present some fundamental relationships. For instance, capital flows occur as a means to avoid political risk. This is usually followed by investors attempting to exchange the nation's currency experiencing political turmoil in favor of more stable currencies (like the US dollar) and is termed "capital flight." Fear of exchange controls increases the likelihood of capital flight, since investors prefer an unrestricted convertibility of funds. An increased supply of the nation's currency following capital flight can augment pressures to devalue.

Also, added political risk increases real rates of return demanded. This can add market pressures to adjust currency value given interest rates reflect changes in real rates of return.

Timeliness of Government Information Releases

The ability to assess a country's economic situation vis-à-vis balance of payments information relies heavily on timely, accurate reporting. The BOP data reflect ex-post transactions, so timely recognition of negative economic trends is critical to funding deficits. Failure to recognize and respond promptly to economic indicators may amplify and worsen a devaluation. Political and nationalistic motives are often barriers to accurate reporting of economic conditions as well.

The situation that prevailed in Mexico in early to late-1994 provides an example of how economic indicators and pressures to devalue can be overshadowed by political motives.

CHAPTER III:
THE 1994 MEXICAN FINANCIAL CRISIS

Using the framework established in the first section, relevant conditions that led to the financial crisis of 1994 can now be examined.

The analysis in this section begins with a description of the international economic reforms that Mexico undertook in the early 1990s through early 1994. A brief macroeconomic summary of Mexico's position that led to the 1994 crisis follows. This study also identifies and develops the role the government and other political forces played throughout 1994.

Mexico's Economic Reform: Early 1990s-1994

Under the presidency of Carlos Salinas de Gortari (1988-1994), Mexico underwent a radical restructuring of its economy. Salinas, a Harvard educated technocrat, worked diligently to reduce tariffs--helping to ratify the North American Free Trade Agreement between the United States, Mexico, and Canada. Salinas privatized Mexico's state-dominated economy and returned the country to world capital markets. However, prospects of sustained growth were temporarily diminished in 1994 as a host of political and economic debacles shook markets worldwide.

Balance of Payments and Economic Indicators: 1990-1994

Having reduced interest rates to the lowest levels in nearly two decades, the investment climate in Mexico appeared stable. The fiscal reforms undertaken by the Salinas administration strengthened the overall economic climate and attracted foreign capital. Foreign investment fueled growth (real economic growth rates are shown in Table III), indicating substantial expansion of the economy through the early 1990s. Through fiscal discipline and a stable peso, inflation was slashed from 150% in 1988 to 10% in 1994. (Robberson, 1995)

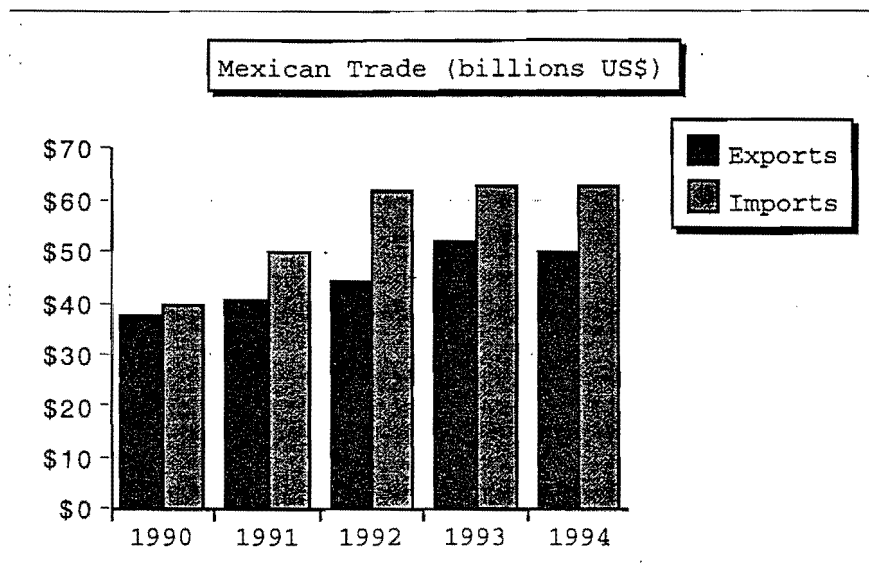
Table III: Selected Economic Indicators (*IMF Survey*, 3-6-95)

	1990	1991	1992	1993	1994
	(percent change)				
Real economic growth	4.5	3.6	2.6	0.4	3.1
	(percent of GDP)				
Gross national savings	15.5	14.3	13.9	14.1	13.7
External current account balance	-3.2	-4.8	-6.8	-6.4	-8.0

However, during this period the current account deficit was increasing. Spurred by reduced tariffs and increasing imports,

Mexico was plagued by overconsumption and a lack of savings. The current account deficit and level of savings as a percentage of GDP are also shown in Table III. NAFTA facilitated Mexico's trade deficit as imports soared, see Table IV. Yet, in early 1994, investors and politicians alike saw no need for alarm since Mexico's reserves totaled over \$30 billion and appeared sufficient to finance the current account deficit. (Chandler, 1995)

Table IV: Mexican Trade (Robberson, 1995)



Mexico's Exchange Rate Regime

Mexico had established a fixed-exchange rate to the US dollar with a flexible band--only intervening in currency markets to sustain the exchange rate of N\$3.4712/US\$ to N\$3.0512/US\$. (*The Economist*, 1-6-1995) Thus, the government's issuance of *cetes*, or 91-day peso-denominated treasury bills, for direct market operations, or use of US dollar reserves would support the fixed-exchange rate regime. *Tesobonos*, or dollar-backed bond issues, were another principal method for maintaining reserve levels. The reserve balance and government operations were key components to regulating the supply of Mexican pesos and hence the currency's

underlying value.

The goal of the fixed exchange rate system aimed to prevent an increase in the cost of imports (should the peso devalue) and manage low levels of inflation--with a resultant steady inflow of foreign investment. (Robberson, 1995) The stability and anti-inflationary environment provided by the exchange rate regime established under Salinas was crucial to sustaining the capital inflows necessary for financing economic growth and expansion.

A Monthly Analysis Leading to Devaluation

The following analysis of events in 1994 reveal numerous early warning signs that pressures to devalue the Mexican peso were growing.

January 1994: Political Turmoil in Chiapas

As NAFTA took effect, a rebel movement in the southern state of Chiapas was brewing. Known as the *Ejército Zapatista de la Liberación Nacional* (EZLN), the rebel group seized four small towns in Chiapas to protest years of economic hardship and neglect by the Mexican government. (Padgett, 1995) Salinas responded by sending the Mexican army to confront the rebels and their leader Subcomandante Marcos. The rebels retreated, but the economic and political damage jarred investors.

February-March 1994: Assassination of Colosio; Capital Outflows Begin

On March 23, the *Partido Revolucionario Institucional* (PRI) candidate slated to succeed Salinas as Mexico's next president was gunned down in Tijuana during a campaign rally. Popular at home and abroad, the news of Luis Donaldo Colosio's assassination

raised concerns about the future of the Mexican government and upcoming elections. The government deemed the assassination the work of disgruntled leaders in the Tijuana PRI branch. Later, the government changed its position stating the assassination was the work of a lone, crazed gunman. (Robberson, 1995) The United States announced a \$6 billion credit line to help stabilize the peso and calm investor fears. Following Colosio's assassination, Salinas quickly named Ernesto Zedillo Ponce de León to the PRI candidacy.

As the US Federal Reserve raised interest rates, higher rates at home prompted jittery US investors to convert peso-denominated securities to dollar-denominated *tesobonos*. Promulgated by two major political shocks, the increasing use of *tesobonos* allowed concerned investors to more easily convert funds to US dollars.

Although the International Monetary Fund voiced no public concern regarding Mexico's growing current account deficit, MIT economist Rudiger Dornbusch warned that "the overvalued peso was stifling growth." (*The Economist*, 10-28-95) Unwilling to debate the issue, the Mexican government defended the fixed-exchange rate regime claiming that a devaluation would "risk rekindling inflation." (*The Economist*, 10-28-95) The government released information showing exports had grown impressively, by 17% in 1994. The fiscal means to deal with the current account deficit rested on forecasted increases in direct foreign investment that were to fuel productivity and exports. (*The Economist*, 10-28-95)

The government essentially failed to recognize the growing need to curb consumption. A devaluation would, in effect, raise the cost of imports and lower the current account deficit, but the Salinas government was unwilling to trade political aspirations for sound economic policy.

April-September 1994: US Fails to Recognize Unsustainable Mexican Economic Policy; Mexican Election Results

Failing to push the Mexican government to change course on its fixed-exchange rate regime, the US government's efforts "lacked urgency and never went beyond exhortations." (Chandler, 1995) US government officials remained relatively unconcerned about depleting reserves (at \$17 billion in August) and capital outflows, attributing them to temporary investor concerns about upcoming elections. The US cited an imminent rebound of capital inflows would occur after election results were announced.

Yet, political troubles in Mexico were mounting. Salinas adamantly defended the fixed-exchange rate regime in hopes of attaining a prominent position in the newly founded World Trade Organization. (*The Economist*, 1-6-95) A stable peso was maintained by purchasing pesos on the market with dollar reserves, but capital flight was adding pressures to reserve levels at an unprecedented rate.

Ernesto Zedillo was elected to the presidency in August and announced plans to continue the fixed-exchange rate regime once sworn in on December 1, 1994. Yet, political shocks were to alter the new president's future economic policies. On September 28, 1994, PRI party president José Francisco Ruiz Massieu was assassinated in Mexico City--(indicted in the scandal in 1995 was Salinas' brother, Raúl Salinas de Gortari). (Fedarko, 1995) As accusations flew throughout 1994, investors were growing weary as Massieu's death marked the second assassination in less than a year. Viewing the political risk Tables I and II, the categories of risk experienced by Mexico throughout the year are alarming: armed attacks, assassinations, guerilla warfare, economic expectations vs. realities. Investors thus continued to exchange political risk for safer and greater returns offered in the US, as

US interest rates continued to rise.

October-December 1994: Dwindling Reserves, Devaluation Imminent

Revealing reserve levels in his state of the nation address, Salinas announced an \$11 billion drop from \$28 billion in late 1993. Salinas also disclosed the current account deficit had swelled to 8% of GDP (see Table III), a level "economists consider dangerously high." (Chandler, 1995) An organized effort to delay release of other important economic indicators spared Salinas from having to report the critical state of the nation to the IMF--an effort to save a prestigious position with the World Trade Organization.

Only two weeks after Zedillo was sworn in on December 1, finance minister Jaime Serra Puche announced the government was "defending the peso" via increased spending, reiterating that Mexico would "absolutely not" devalue. (Chandler, 1995)

Just nineteen days into the Zedillo presidency, EZLN rebels continued their offensive and seized roads in Chiapas. Investors were caught off-guard. On December 20, 1994, the Zedillo administration, pressured by dwindling reserves of \$7 billion, suddenly announced an increase in the flexible band on the fixed-exchange rate regime from N\$3.4712/US\$ to \$4.0016/US\$. (*The Economist*, 1-6-95) Though technically not a devaluation, the controlled 13% drop was intended to ease pressure on reserve levels. The Mexican government's failure to notify financial institutions or Washington created a severe panic. The sudden government announcement combined with renewed confrontations with EZLN rebels resulted in a mass dumping of Mexican bonds and stocks. The government could not afford to use its reserves to defend the value of the peso, forcing a devaluation. The following day, the government was forced to let the peso float.

By February of 1995, the peso/dollar exchange rate was at N\$6.200/US\$. (*The Economist*, 10-28-95)

The government, having exhausted its reserves defending an overvalued peso throughout 1994, would now have to borrow extensively from abroad to retire the massive influx of dollar-denominated *tesobonos* coming due--or face default. A rescue package from the United States and the IMF totaling nearly \$53 billion was assembled in February of 1995, sparing Mexico's default. (Foust, 2-13-95)

CHAPTER IV:
CONCLUSION

The extensive framework applied to Mexico shows that specific fundamental economic and political conditions were pressuring the government for a currency devaluation in 1994. The framework of international parity conditions, Balance of Payments relationships, and political events applied to Mexico highlight an economic climate ripe for a currency devaluation.

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