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RETURNS ON BANK DEPOSITS IN LATIN AMERICA

(Is there a free lunch?)

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ABSTRACT

We set out to demonstrate that one could earn a higher return by investing in Latin American bank deposits as opposed to US (eurodollar) bank deposits during 1980-1999. This turned out not to be the case in almost all instances, and we use this article to explain why. The reasons were not the higher transactions costs in Latin America. Rather, governments tightly controlled (repressed) the financial markets in the 1980s, such that the lower returns produced capital flight rather than a normal open-market outcome of higher return to offset higher risk. When the markets were opened up to more competition and freer capital flows in the 1990s, the resulting returns did rise above those in eurodollars, but not enough to compensate the lower returns of the 1980s. We assert that in the 2000s, returns in Latin America will move to a more traditional risk/return profile, but if the 1990s are any indication, they still may be a poor choice for dollar-based investors.

BIOGRAPHIES

Robert Grosse is Director of Research at Thunderbird, the American Graduate School of International Management. Evan Tanner is a research economist in the Western Hemisphere Division of the International Monetary Fund and instructor in the IMF Institute. Roberto Curci is Assistant Professor of Economics at Butler University.

I. INTRODUCTION

Nominal, local-currency rates of return on similar bank deposits in Latin America have consistently remained above those in the United States, during periods of economic boom, recession and transitions between the two. These differences can be attributed partly to higher perceived risk in the Latin American countries (viz., higher real interest rates), but they may also be due to additional factors such as continuous deviations from purchasing power parity. And even more striking – they may not imply truly higher returns in Latin America at all, once currency devaluation is taken into account.

This paper analyzes the interest differentials in US dollar terms between United States bank deposits and bank deposits in several Latin American countries during the time period 1982-99. This period encompasses the debt crisis of the 1980s, generally agreed to have begun in 1982, and the economic boom of the 1990s, beginning at different times for different countries between 1989 and 1992. Surprisingly, the general finding is that Latin American countries did not demonstrate higher returns in US dollar terms than the returns on similar financial instruments in the United States, but there are many differences between countries and time periods. The goal of this paper is to contribute toward explaining these phenomena.

It is reasonable to think that investments that have a history of higher volatility will consequently also have a history of higher average returns than the investment used as the base of comparison. What is surprising about the Latin American situation is the wide divergences in returns across countries and also the way that the 'risk premium' changes over time from high to low and also differs across countries. There appears to be more going on than simple adjustment of returns to reflect changes in risk.

II. CONCEPTUAL BASE

The underlying empirical reality of Latin American returns is that they are much more volatile than returns in the United States; so one would expect a concomitant higher average return in Latin America. However, as shown below, the average returns for Latin American deposits during the past 20 years frequently did not exceed those in the United States, even with the higher volatility. The "normal" pattern of higher risk being compensated by higher return did not occur in this context (cf. Smith and Walter, 1997). Given this reality, our task is to try to explain this unusual risk/return relationship, over time and across countries.

As a basis of comparison, returns will be discussed consistently in dollar terms. That is, rates of return in Latin American countries will be discussed in terms of their exchange-rate-adjusted values, in dollar rather than local currency terms. In the analysis ex post values will be used, that is, local currency interest rates adjusted for realized exchange rate changes over the relevant period.¹ Restating the main point: it was anticipated that Latin American bank deposit interest rates, adjusted into dollar terms using realized exchange rates, should have been persistently higher than similar bank deposit rates in the United States during 1982-99. This situation suggests our first hypothesis.

Hypothesis #1: Latin American interest rates, in dollar terms, have been higher than comparable US rates during 1982-99.

Over time, it is expected that during periods of greater macroeconomic stability in Latin America, the volatility of returns should be lower, and the risk premium demanded by investors should be lower than otherwise. Thus, during the more-stable 1990s up to 1997 at least, returns may be expected to be closer to those in the United States, and the variance of these returns should be lower than during the more turbulent 1980s. Even this generalization must be taken with caution, since the 'Tequila effect' of Mexico's financial crisis at the end of 1994 caused rates and returns to gyrate wildly for almost a year in a few countries of the region. The 1997-98 Asian financial crisis, and certainly Brazil's financial crisis in early 1999, also may affect the Latin American risk/return characteristics during this period. Based on the differences between the two decades, we suggest hypothesis 2.

Hypotheses #2a and b: Latin American interest rates, in dollar terms, have been closer to US rates in the 1990s, and Latin American rate volatility has declined relative to the 1980s.

Across countries, it is expected that the less macroeconomically stable countries (e.g., Argentina, Brazil and Peru, each of which experienced annualized inflation of over 1000% at some time during the period) would have required higher rates of return than their more stable neighbors. Likewise, when the same country was more stable macroeconomically, it should have demonstrated a lower risk premium (lower excess return over the US return) and also a lower variability of returns. Relative risk across countries suggests the next hypothesis.

Hypothesis #3: More risky Latin American countries will have higher realized returns than less risky countries during 1982-99.

Beyond the simple mean/variance aspects of Latin American investments, we may also expect an impact of international portfolio diversification on the required returns (Grubel, 1968). That is, we should expect that, if the correlations between the Latin American returns and US returns are low or negative, then the returns required by international (dollar based) investors should be lower than if the correlations are positive and higher. If investors can reduce their overall portfolio risk by diversifying into Latin American investments, then they will demand a correspondingly lower return on the Latin American investments. In most of the literature this issue has been examined in the context of stock market investments, rather than bank deposits, but analogous logic holds here.² The problems of currency convertibility and transactions costs are especially crucial here, so the analysis is more limited in this area. Our expectation is that:

Hypothesis #4: Investors can reduce overall portfolio risk, or raise return for a given risk, by diversifying into Latin American bank deposit instruments.

Another issue that can be considered using the bank deposit rate information is the similarity or dissimilarity of Latin American returns compared to European or Asian ones. In looking at the rate of return in dollars versus Deutsche marks or yen, analysts have found that the differences in nominal interest rates can be partly attributed to real interest differences between countries and partly to deviations from purchasing power parity. In the case of industrial-country currencies, most of the difference in returns comes from deviations from purchasing power parity. Given the lower level of macroeconomic development in Latin America, we may expect to find more of the difference in returns attributable to real interest differences, that is, to a continuing risk premium – but deviations from PPP also need to be explored. This issue suggests our final hypothesis.

Hypothesis #5: Latin American bank deposit returns demonstrate a greater component of real interest differences with respect to the US returns, as opposed to deviations from purchasing power parity.

III. THE FACTS

Rates of return in Latin American countries have certainly been volatile in comparison with US returns on similar financial instruments. For example, using the most similar investment – a 3-month eurodollar bank deposit³ – the average 3-month return in United States dollars for 1982-99 was 1.74 percent, with a standard deviation of 0.63 percent. In contrast the average (quarterly) return on a 3-month interbank deposit in Argentina was the US return minus 1.13 percent, with a standard deviation of 27.89 percent; and the average return on a similar deposit in Mexico was US minus 1.98 percent, with a standard deviation of 10.25 percent. In each instance the Latin American volatility, measured as the standard deviation of the returns, is far higher than the US volatility.

Since one might expect different results under greatly different institutional and global economic conditions (Bekaert et al., 1998), the total time period was subdivided into the early period that covered the Latin American debt crisis, from 1982 until whatever year the country demonstrated stabilized, positive economic growth.⁴ This was between 1989 and 1994, depending on the country. Clearly, the results demonstrate that greater economic stability in recent years has coincided with improved returns for all of the Latin American countries studied (except for Brazil, which had a slightly higher return in the earlier period).

Table 1 shows the rates of return for the Latin American countries and the United States, using the US rate as the base and presenting average excess returns for the Latin American countries.

TABLE 1:
RATES OF EXCESS RETURN ON 3-MONTH BANK DEPOSITS*

Country	Period 1	Period 2	Total Period
Argentina	Dec81-May91 -0.0328 (0.3824)	June91-Dec99 0.0129 (0.0120)	Dec81-Dec99 -0.0113 (0.2789)
Brazil	Dec82-Nov94 0.0302 (0.1924)	Dec94-Dec99 0.0201 (0.1023)	Dec82-Dec99 0.0273 (0.1710)
Chile	Dec81-Feb90 -0.0189 (0.0778)	Mar90-Dec99 0.0113 (0.0344)	Dec81-Dec99 -0.0026 (0.0603)
Colombia	Mar86-Feb90 -0.0079 (0.0087)	Mar90-Dec99 0.0080 (0.1065)	Mar86-Dec99 0.0034 (0.0899)
Mexico	Dec81-Feb89 -0.0512 (0.1278)	Mar89-Dec99 0.0015 (0.0742)	Dec81-Dec99 -0.0198 (0.1025)
Peru	Mar88-May92 -0.0869 (0.3537)	Jun92-Dec99 0.0030 (0.0365)	Mar88-Dec99 -0.0298 (0.2185)
Venezuela	Mar84-Feb90 -0.0418 (0.1586)	Mar90-Dec99 -0.0086 (0.1078)	Mar84-Dec99 -0.0213 (0.1302)
United States (simple quarterly returns)	Dec81-Feb90 0.0223 (0.00532)	Mar90-Dec99 0.0132 (0.00319)	Dec81-Dec99 0.0174 (0.00625)

(Numbers in parentheses below the average returns are standard deviations.)

* These rates are calculated as quarterly average rates for the time period shown, Latin American rate converted to dollars minus the US (eurodollar) rate.

Time periods are divided into the earlier, debt-crisis period of instability versus 1990s period of stabilization. Most countries stabilized by the end of 1989. Exceptions were: Argentina, Brazil and Peru.

Source: Calculated by the authors from IMF, *International Financial Statistics*.

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Notice that for all of the countries except Brazil, the average excess returns over the US 3-month bank deposit rate were negative during the debt-crisis period of 1982-99. The great volatility in these markets was not offset by higher returns in dollar terms. During the 1990s in the era of economic opening throughout Latin America, excess returns have been positive in all cases except Venezuela, where the difference from US returns was less than one percent. The average excess returns for all countries for the entire 1982-99 period are about negative 1-2 percent, with the exceptions of Brazil (+2.7%) and Colombia (+0.3%).

In sum, we observe much worse dollar returns in Latin American bank deposits versus eurodollar deposits during the volatile 1980s, and typically slightly higher Latin American returns during the more stable 1990s. Overall, there did not seem to be a "free lunch" for investors who could move funds to those banking markets, despite the often incredibly high local-currency deposit interest rates.⁵

IV. METHODOLOGY

Average excess returns for the seven Latin American countries (Argentina, Brazil, Chile, Colombia, Mexico, Peru and Venezuela) were calculated as:

$$\text{av. excess return} = \frac{\text{nominal Latin American return on 3-month CD}}{\text{currency devaluation over the period}} - \frac{\text{nominal US return on 3-month CD}}{\text{3-month CD}}$$

Three-month periods were used, so that the data began with the period January-March, 1982, then moved to February-April, 1982, etc., through October-December, 1999. The analysis used ex post data, so that the end-of-period exchange rate was the actual observed rate, rather than a forward or predicted rate at the beginning of the period when the investment decision would have been taken.

V. HYPOTHESIS TESTING

Each of the five hypotheses was tested using the data described above, and the results are discussed here.

Hypothesis #1: Latin American interest rates have been higher than comparable US rates during 1982-99.

This hypothesis appeared unlikely to be supported, based on observation of Table 1. The majority of the Latin American countries, except Brazil and Colombia, had lower average returns during 1982-99 than the United States. Using a simple t-test for the difference between means, we find that the returns were significantly lower for Mexico, Peru and Venezuela and significantly higher for Brazil. All of these results can be seen in Table 2 column 1.

TABLE 2:
HYPOTHESIS TESTS

Note: Actual Excess Returns are used to test H2a & H2b

Country	Hypothesis #1 (t-test)	Hypothesis #2a (t-test)	Hypothesis #2b (F-test)
Argentina	-0.60	-1.20	42.77***
Brazil	2.27**	0.38	6.25***
Chile	-0.63	-3.78***	3.81***
Colombia	0.479	-1.03	6.60***
Mexico	-2.83***	-3.81***	18.85***
Peru	-1.61*	-2.38***	86.11***
Venezuela	-2.24**	-1.71**	2.86***
United States	average return: standard deviation:	1.85 percent / 3 months 0.79 percent / 3 months	

Hypothesis #1: Latin American XR-adjusted nominal rates are higher than US rate, 1982-99.

Hypothesis #2a: Early period excess returns are higher than later period excess returns.

Hypothesis #2b: Early period standard deviations of excess returns are higher than later period standard deviations of excess returns.

This outcome is quite surprising, if we assume that the context in which the returns were occurring was in some sense "homogeneous." It appears that, despite the open-market expectation that risk and return should compensate each other, in riskier Latin American countries the bank deposit returns were lower than in the US (or more precisely, in eurodollars). Next we need to consider the risk more explicitly.

Hypotheses #2a and b: Latin American interest rates have been closer to US rates in the 1990s, and Latin American rate volatility has declined relative to the 1980s.

This pair of hypotheses can be tested in several ways. First consider the second part, comparing interest rate volatility between the earlier debt crisis and the later economic opening periods. In this comparison using F-tests for differences between variances, all countries except Colombia showed a significant reduction in rate volatility during the 1990s (see Table 2). In the case of Colombia there was a significant increase in rate volatility during the later period. In most instances the interest rates, converted into dollar terms, became much more stable during the non-crisis period. This is interesting because the open-market period did include such crises as the Mexican

Tequila crash at the end of 1994 and the Brazilian maxi-devaluation in January of 1999 – but even with these problems, the interest rates were less volatile through the decade than in the 1980s. Next, the average excess returns are compared by country for the debt-crisis period versus the post-debt-crisis period. A significant positive t-statistic implies a significantly lower mean excess return for the later period. This was not found for any of the countries, although Brazil did have a positive but insignificant test result. The other six countries in the sample demonstrated higher excess returns during the recent period, and most were significantly higher than during the debt crisis except for Argentina and Colombia (see Table 2).

This is quite counterintuitive, and must be due to fundamental changes in the markets and their regulation, rather than to perverse financial characteristics. That is to say, the higher returns that accompanied lower risk in the 1990s were not due to shifts in investor preferences but rather to shifts in underlying market characteristics such as bank regulation, currency policies and capital controls. Broadly speaking, government controls on the financial markets during the 1980s did not allow open market factors to determine rates, and by trying to control both interest rates and capital flows, governments in Latin America ended up with lower rates than would have been justified by the high volatility – and enormous capital flight as investors found that the returns in these markets were not adequate.

Hypothesis #3: More risky Latin American countries will have higher realized returns than less risky countries during 1982-99.

Regressing the average return for each country for the full period on the standard deviation of that country's returns for the full period tests this hypothesis. As you can see in Table 3, the regression produced a coefficient of determination (R²) of 0.11, which is not significant. The coefficient for the standard deviation is negative and not significant as well. The implication of these findings is that the relationship between risky countries and higher returns is not found; it appears that the opposite may be true (that is, riskier countries may have offered lower returns) in this period in Latin America, although the results are not significant. Based on the statistical test, hypothesis #3 is not supported.

TABLE 3:
HYPOTHESIS TESTS

Hypothesis #3: More risky Latin American countries will have higher realized returns than less risky countries during 1982-99.

This hypothesis was tested using a simple regression of returns on risks for the seven Latin American countries.

$$\begin{aligned} \text{Return in Latin America} &= \beta \text{ (standard deviation of returns)} \\ R_{it} &= -0.025 \text{ (std. dev.)} \\ &\quad (t = -0.55) \end{aligned}$$

$$R^2 = 0.11$$

Hypothesis #4: Investors can reduce overall portfolio risk, or raise return for a given risk, by diversifying into Latin American bank deposit instruments.

This hypothesis is supported by the evidence presented in Table 4 and Figure 1 on the following pages.

Hypothesis #5: Latin American bank deposit returns demonstrate a greater component of real interest differences with respect to the US returns, as opposed to deviations from purchasing power parity.

Regressing the nominal interest rate difference on the real interest rate difference (defined as the nominal rates minus inflation) produced the following results:

$$\begin{aligned} \text{Nominal Interest Rate Difference} &= 0.050 & + & 0.484[\text{real interest rate}] \\ &\quad (t=11.56)^{***} & & \quad (t=26.13)^{***} \end{aligned}$$

$$\text{adjusted } R^2 = 0.34$$

number of observations: 1,339

(t-test values in parentheses) ***=significant at .001 level.

Hypothesis #4: Investors can reduce overall portfolio risk, or raise return for a given risk, by diversifying into Latin American bank deposit instruments.

Beyond the simple mean/variance aspects of Latin American investments, we may also expect an impact of international portfolio diversification on the required returns. That is, we should expect that, if the correlations between the Latin American returns and US returns are low or negative, then the returns required by international (dollar based) investors should be lower than if the correlations are positive and higher. If investors can reduce their overall portfolio risk by diversifying into Latin American investments, then they will demand a correspondingly lower return on the Latin American investments. In most of the literature this issue has been examined in the context of stock market investments, rather than bank deposits (e.g., Errunza et al., 1999), but analogous logic holds here (cf. Jorion, 1989).

As shown in Table 4, the correlations between the Latin American interest rates, converted into dollar returns, and the eurodollar rates, are negative for all countries except Chile, for which the correlation between peso deposits and eurodollar deposits was 0.06, a very low correlation. These findings imply that the combination of a eurodollar deposit with deposit(s) in a Latin American country(ies) would enable the investor to reduce risk. Still, the returns were frequently lower than in eurodollars, so the benefits from diversification were likely to be limited.

TABLE 4:
CORRELATIONS OF LATIN AMERICAN RETURNS WITH US RETURN

Country	expected return above US	std. dev.	<u>correlations</u>						
			Arg	Braz	Chil	Col	Mex	Peru	Ven
Argentina	0.06	27.3	-----						
Brazil	4.46	16.9	-0.05	-----					
Chile	1.87	6.0	0.00	0.13	-----				
Colombia	2.45	4.2	0.00	0.14	0.22	-----			
Mexico	-0.22	10.1	0.01	0.00	0.07	-0.06	-----		
Peru	-1.34	21.5	-0.14	-0.01	-0.04	0.06	-0.07	-----	
Venezuela	-0.53	12.9	0.10	-0.17	-0.06	-0.02	-0.04	0.04	-----
USA	1.85	0.79	-0.21	-0.13	0.06	-0.24	-0.19	-0.26	-0.05

By combining the eurodollar deposit with combinations of Latin American deposits, an optimal portfolio can be designed. Assuming that the goal is to maintain risk at the same level as with the US bank deposit alone, Figure 1 shows that diversifying into Latin American bank accounts enables the investor to keep risk at the same level and raise the average return from 1.85 % per quarter to 1.96 % per quarter. Diversification takes place only into Argentine, Brazilian and Colombian bank deposits, which make up 13 percent of the optimized portfolio (using the Ibbotson software). All of the other countries are dominated by these three, given the low risk of the US deposit and the superior risk/return characteristics of the Brazilian and Colombian deposits versus those of all other countries.⁶ This finding is consistent with previous studies that indicate that Colombia is the Latin American country with the lowest level of correlation with international markets, offering the best diversification benefits for international investors (Ellis et al., 1997).

In this situation, if the depositor/investor were willing to tolerate some more risk, the returns could be greatly increased. Increasing the level of acceptable risk moves the deposit portfolio immediately away from the US into Colombian and Brazilian deposits. When the portfolio moves closer to the maximum return/maximum risk end of the efficient frontier, Brazil dominates the other countries, while Chile, Mexico, Peru and Venezuela do not show up in any of the optimal portfolios.

The major complication that occurs in our case is that of institutional constraints. Most of the Latin American countries have used capital controls and foreign exchange controls during the period. For example, Colombia up until 1991 disallowed domestic investors from investing abroad, and had controls on foreign investors' ability to buy dollars to remit their peso earnings from Colombia. Colombia introduced a new foreign investment code in January 1991 (Resolution 49), through which foreign direct and portfolio investments were stimulated. Most international capital flow restrictions were lifted and foreign exchange trading was simplified. For instance, prior to the introduction of the new code both foreign investors and nationals alike were required to obtain prior approval to undertake any foreign exchange transactions from the central bank; otherwise such transactions were deemed illegal.

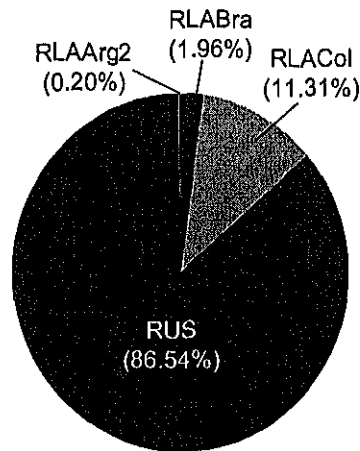
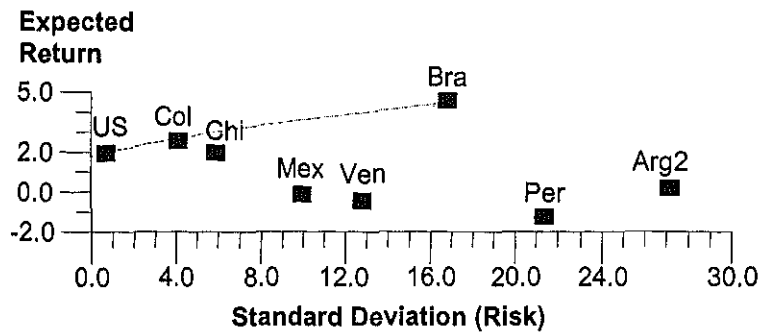
After 1991, however, foreign investors and domestic participants are not required to obtain prior approvals to undertake foreign exchange transactions and can trade among themselves (free market transactions) and through financial institutions (regulated and free markets transactions), and are only required to declare specific transactions to the central bank. The key transactions costs of investing in Colombia now are associated with the intermediation margin in the foreign exchange market and with remittance taxes.

These features were not exclusive to Colombia. Venezuela operated a multiple exchange rate system in the early 1980s, and has restricted capital outflows since then under various policies. Mexico, Chile and Argentina (only since 1991) are the best examples of countries in our sample that would allow foreign investors to hold local bank accounts, earn the returns that are under discussion here, and remit the profits at any time.

In sum, the portfolio modeling effort supports the hypothesis that returns can be increased by diversifying into Latin American deposits. Very little diversification is justified if the investor wants to maintain very low risk; but at somewhat higher levels of risk the returns can be greatly improved. It should also be noted that correlations between interest rates in Latin America and the US rate are generally negative, implying good opportunity for diversification if only the returns were higher. (See Table 4 and Figure 1.)

FIGURE 1:
OPTIMAL PORTFOLIO OF US AND LATIN AMERICAN BANK DEPOSITS,
1982-99

Efficient Frontier



Portfolio Statistics

% of Portfolio Brazil	1.96
% of Portfolio Colombia	11.31
% of Portfolio U.S.	86.54
Exp Return	1.96
Std Deviation	0.79

U.S.-Only Portfolio

Exp Return	1.85
Std Deviation	0.79

Hypothesis #5: Latin American bank deposit returns demonstrate a greater component of real interest differences with respect to the US returns, as opposed to deviations from purchasing power parity.

This hypothesis was supported by regression analysis as presented in Table 3. Since the real interest difference and the deviations from purchasing power parity fully determine the variation in nominal interest rates, only one of them can be tested in a statistical model. The argument that real interest differences are key to nominal interest differences between these Latin American countries and the United States is tested in the model here, and the results show clearly that the real interest rate differential is highly significant. By itself it explains 34 percent of the variation in the nominal returns in Latin America.

This outcome is quite different from findings that compare US returns with those in Europe and Japan, where the deviations from purchasing power parity dominate, and real interest differentials are low or zero.

VI. CONCLUSIONS

We cannot claim that there is a free lunch, i.e., that an investor could clearly gain by placing his/her investment into Latin American bank deposits throughout the past 19 years. In fact, the evidence does support the idea that in several countries lower returns than those in US dollars have persisted through this period, and that diversification into Latin American deposits was not particularly beneficial.

The wildly high (nominal) returns generated by the most inflationary countries (Argentina, Brazil and Peru) at times during the 1980s were largely nullified by currency devaluations that accompanied or followed these times. For that entire decade, the Latin American countries were poor alternatives to US dollar-denominated bank deposits in the euromarket. In the 1990s the situation became more normal, with the majority of countries showing higher dollar returns than in the euromarket, to go along with the higher risks of those investments. Even so, these excess returns were not significantly higher than the eurodollar ones. It appears that most Latin American countries were and continue to be a poor choice for deposits by a dollar-based investor, even in the late 1990s.

Considered in a portfolio context, it appears that only Brazil and Colombia would make a good addition to eurodollars for bank depositors looking for a relatively low-risk portfolio, although even in this instance the lowest risk portfolio (not shown) contains only the eurodollar deposit. For investors willing to take on somewhat greater risk levels, the benefits from diversifying into Brazilian and Colombian deposits were noticeably greater during the 1990s.

The primary reasons for the generally unexciting returns are the enormous structural shifts that took place in the Latin American business systems, from continuing crisis during most of the 1980s to economic opening in the 1990s. These macroeconomic conditions were paired with extremely restrictive regulatory conditions in the 1980s, and then with relatively open conditions in most of the 1990s. One would expect the current decade to produce the "normal" positive risk/return profile for these countries, and likewise a positive risk premium on their deposits, given the somewhat higher risk that still exists relative to that on dollar deposits.

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ENDNOTES

¹ This ex post formulation raises a key point. If returns were also similar to this *ex ante*, then investors would have been expected to take their investable funds elsewhere. This is precisely what happened in the case of foreign bank lenders, that decreased their loans to Latin America dramatically during the decade. This was also true for domestic investors, with the enormous capital flight that occurred throughout Latin America during the 1980s. Thus it appears that *ex ante* returns were also generally lower in Latin America during the 1980s, and despite government policies to restrict capital outflows, investors did take their funds out of these countries in search of better returns elsewhere, mainly in the US.

² In a domestic context, one could argue that the distribution of bank deposit returns is always positive, ignoring uninsured bankruptcy risk. In the international context, with exchange rate changes, bank deposit returns measured in dollars may be positive or negative, so the returns are distributed more like stock market returns than domestic bank deposits.

³ We used line 60L in International Financial Statistics (IMF: Washington, D.C.: CD-ROM, 2000) for each of the countries. This interest rate is generally defined as the interbank deposit rate on 3-month deposits, but it varies to some extent across countries. For the United States, we used the 3-month euro-dollar deposit interest rate, line 60LDD, assuming that the investor was comparing returns from foreign deposits.

⁴ Bekaert and Harvey (1999) provide a detailed analysis of official liberalization dates for Latin American countries.

⁵ The deposit interest rate on interbank deposits in pesos in Argentina was 9,722 % on an annualized basis in January of 1990.

⁶ Although not shown in the paper, higher returns are possible by diversifying further into Brazilian and Colombian deposits. At the lower end of the efficient frontier, most of the investment goes into Colombian deposits. The US deposit is excluded once the risk level (standard deviation) rises about 4% per month, and the Brazilian deposit dominates all others at the highest return point on the efficient frontier, with a risk of about 17% per month.