

IMF Working Paper

Stock Market Developments and Private Consumer Spending in Emerging Markets

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Abstract

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Using a panel of 16 emerging markets, the paper finds a small but statistically significant effect of stock market developments on private consumption spending. In the short run, a 10 percent decline in the annual real stock market return is associated with a reduction in real private consumption by around 0.1–0.3 percent on average. There is evidence that the link between stock market fluctuations and private consumption has become stronger during the 1990s as stock markets in emerging economies have broadened and deepened. However, there is no significant evidence that the influence is asymmetric. Stock price declines do not have a different impact on consumption than stock price increases.

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I. INTRODUCTION

The experiences of the 1929 and 1987 stock market declines as well as more recent stock market developments raise a host of questions for economic analysis. One important policy issue relates to the impact of stock market developments on private consumption. Theory suggests that a stock market boom may increase consumption pressures, whereas drastic declines in equity prices may contribute to a slowdown in economic activity. The evidence, mainly for the United States and a few other industrialized countries, indicates that there is a stock market wealth effect, though the size, as well as the timing of the effect, remains debated.

However, there is little analysis on the link between stock market developments and private consumption for a group of emerging markets. Insufficient data and the historically smaller stock market size in these countries account for this. However, in recent years stock markets in emerging markets have become deeper and more integrated into world markets. Hence, economic developments in emerging markets may become more vulnerable to the ups and downs of stock market prices. Policy questions, which have already gained some prominence in industrialized countries, are expected to become more important in emerging markets as well. Issues include: Is there a link between stock market developments and private consumption in emerging markets and of what nature is the link? Is the link expected to increase as stock markets gain importance? Is the effect asymmetrical in the sense that stock price decreases have a more or less pronounced effect on private consumption than stock price increases? In which way do macroeconomic policies have to take account of the link between stock market developments and private consumption?

With these policy issues in mind, the aim of this paper is to offer some empirical evidence on the link between stock market developments and private consumption in emerging markets. This work is partially stimulated by similar analyses for developed economies (e.g., Case, Quigley, and Shiller, 2001; Ludvigson and Steindel, 1998; Poterba, 2000; Shirvani and Wilbratte, 2000). It also relates to analyses that examine the information content of asset prices for real economic developments (e.g., Christoffersen and Sløk, 2000; Mauro, 2002) and analyses that look more generally at the financial and macroeconomic implications of an increasing international integration of emerging stock markets (e.g., Bekaert, Harvey, and Lundblad, 2001a,b; Kim and Singal, 2000; Henry, 2000a,b; and Fuchs-Schündeln and Funke, 2001). This paper suggests a positive connection between stock market returns and aggregate private spending in emerging markets. However, as expected, the effects are small and are fairly short-lived.

Section II gives a brief overview of theoretical considerations and recent empirical investigations. Section III presents empirical evidence for 16 emerging markets. As a first step, the focus is on a particular episode associated with a one-time revaluation of equity prices, namely the liberalization period of those markets. Afterwards simple structural consumption equations are estimated, which incorporate the direct impact of stock market fluctuations. A number of sensitivity analyses follow with respect to different time periods and asymmetries of the effects. Section IV summarizes the main results and draws some broad policy conclusions.

II. THEORETICAL CONSIDERATIONS AND EMPIRICAL EVIDENCE

Economic theory suggests that fluctuations in stock prices, or asset prices more generally, have an impact on private consumption through a wealth effect. A closer analysis of budget constraints already suggests a close relationship (e.g., Poterba, 1999). If the wealth of an individual increases permanently, the individual can either spend that wealth himself, give it to another individual or institution, or the individual may leave it as bequest to his heirs. The wealth increase will lead to an increase in consumption at some point, except in the case where the individual does not increase his own spending and the beneficiaries behave in the same way thereafter.

Stock market gains may affect consumption through various transmission mechanisms (see, e.g., Ludwig and Sløk, 2002). Realized capital gains may have a direct impact on consumption. Unrealized capital gains may have an impact on today's and future consumption through effects related to the expectation of higher future income and wealth or through the reduction of liquidity constraints. Rising stock prices may also stimulate consumption through an increase in the value of stock options. Indirect effects may also occur through changes in relative prices of financial assets and real assets.

More formal analyses go back to the permanent income theory by Friedman (1957) and the life cycle theory of Ando and Modigliani (1963). Simple versions of the life cycle savings hypothesis suggest that an increase in wealth will result in an increase in private consumption over time. According to these models, the marginal propensity to consume out of wealth is rather small, only slightly higher than the real interest rate (Case, Quigley, and Shiller, 2001). There are a number of reasons why consumer behavior may differ substantially from these calculations. First, simple versions of the model assume certainty but in most cases changes in wealth are uncertain. Consumers will always face the challenge to distinguish permanent price changes from temporary price changes. Second, research on consumer behavior indicates the desire for precautionary savings for future emergencies or savings for retirement. Third, if bequest motives play an important role, the consumption effect may not be visible for a very long time. Fourth, liquidity constraints can also alter this relationship. For example, if stocks are used as collateral for borrowing, even a temporary fall of the value of collateral may increase liquidity constraints and may force individuals to adjust (see, e.g., Boone, Giorno, and Richardson, 1998). Despite strong theoretical reasons for a wealth effect, the timing and the magnitude of the effect depend on individual behavior and are difficult to predict.

Empirical analyses for industrialized countries support the prediction that there is a link between private consumption and stock market wealth. But the evidence remains somewhat mixed across countries. This reflects, in part, differences across countries in the relative importance of stock markets, the composition of wealth, incentive structures, taxation, and more generally in consumption behavior. Recent studies for the United States find that a \$1 increase in stock market wealth leads to additional spending of 4-7 cents (e.g., Davis and Palumbo (2001), Kiley (2000), Starr-MacCluer (1998), Zandi (1999), Gale and Sabelhaus (1999), and Parker (1999)). The main effect is short-lived and dissipates over 1-3 years (Starr-MacCluer, 1998). Estimates

are sensitive to the choice of the observation period, and the link between stock market wealth and private consumption is somewhat unstable (Ludvigson, and Steindel, 1999).

For other large industrialized countries studied, the evidence remains more mixed. The wealth effect tends to be weaker particularly in Japan and continental European countries, in part reflecting the smaller stock market size relative to GDP (Boone, Giorno, and Richardson, 1998). There is also evidence that the wealth effect differs with the type of stock market investments. For seven OECD countries, Edison and Sløk (2001) look at potential differences in the impact of changes in valuation of “new” and “old” economy stocks. For the United States they find that the consumption impact of a change in the valuation of old economy stocks is larger than the impact in the valuation of TMT-stocks (telecommunication, media, and information technology). However, this pattern is not consistent across countries.

Given the smaller size of stock markets in many emerging markets, the wealth effect may be expected to be lower in these economies than in some industrialized countries. An x percent change in the value of stocks will obviously have only a smaller impact on consumption. However, the impact of a few other factors is more difficult to gauge. It is open to debate in which way certain shareholder characteristics, such as the concentration of stock ownership, the planning horizon,² and the risk aversion of shareholders differ in emerging markets from those in industrialized countries. Unfortunately, for most emerging markets no time series data is available for these structural variables. The following empirical analysis is a first attempt to assess the link between stock market developments and private consumption in emerging markets.

III. EMPIRICAL ANALYSIS

A. The Sample

The empirical analysis focuses on 16 emerging markets in which stock markets have gained at least some importance. The analysis includes all emerging markets for which private consumption data and stock market returns are available at least since the second half of the 1980s.³ All of these stock markets are by now integrated into world capital markets at least to a significant degree. They have officially opened their stock markets to foreign participation over the last 15 years. Our sample comprises eight Asian and six Latin American countries, and one African and one European country. Financial data are taken from the emerging market database of Standard and Poors (the database was formerly owned by the International Finance Corporation). Stock market returns for individual countries refer the IFC/S&P total return index.

² The planning horizon would be influenced by the average age of stockholders relative to life expectancy. A shorter planning horizon would tend to increase the wealth effect.

³ Equity returns for Indonesia only start in 1989.

The index, denominated in U.S. dollars is used because in situations of significant monetary instability, as in a number of countries during the observation period, private agents often start to think and calculate in foreign currency (see, for example, also “Argentina’s Crisis,” *The Economist*, 2002).⁴ Private consumption data refer to private consumption expenditure at constant prices and are from the IMF’s World Economic Outlook database. All other data are either from the IMF’s *International Financial Statistics* and the *World Economic Outlook*, or the World Bank’s *World Economic Indicators*. The data are annual for the 1985 to 2000 period.⁵

Table 1 gives some basic information on the development of the stock markets in our sample. The table indicates the year of establishment of the stock market, the liberalization year,

Table 1. Stock Markets and Stock Market Liberalizations: Basic Data

	Establishment	Stock Market Liberalization	Market Capitalization in year of liberalization in % GDP	Market Capitalization in % GDP (2000)	Market Capitalization in Bn. US\$ (2000)
Argentina	1854	1989	17.7	58.2	166.1
Brazil	1890	1991	7.8	40.9	226.2
Chile	1893	1992	74.6	91.7	60.4
Colombia	1928	1991	10.9	12.4	9.6
India	1875	1992	25.7	32.6	148.1
Indonesia	1912	1989	2.2	20.1	26.8
Korea	1956	1992	34.4	36.3	148.7
Malaysia	1973	1988	69.5	130.9	116.9
Mexico	1894	1989	11.1	22.1	125.2
Nigeria	1960	1995	8.9	11.2	4.2
Pakistan	1947	1991	16.2	11.3	6.6
Philippines	1927	1991	21.4	77.5	51.6
Thailand	1974	1987	10.6	26.1	29.5
Turkey	1866	1989	7.1	37.3	69.7
Venezuela	1840	1990	18.2	6.9	8.1
Zimbabwe	1896	1993	23.4	41.8	2.4

Sources: Bhattacharya and Daouk (2001), Standard & Poors, International Federation of Stock Exchanges, IMF, World Bank. For a discussion of stock market liberalization dates, see Fuchs-Schündeln and Funke (2001).

⁴ Qualitative results and policy implications of this paper remain unchanged, if a total return index expressed in local currency is used.

⁵ Higher frequency data are available for financial variables but for the countries under consideration most macroeconomic variables are only available on an annual basis.

and general information on the size of the market.⁶ The size is described by the market capitalization as a percent of GDP, which is the value of listed shares in the domestic stock exchange. By and large, the overview indicates that stock markets in most countries under consideration have reached a noticeable size. In 2000, the unweighted average of the market capitalization to GDP was around 40 percent. This average level is thus higher than the average market capitalization in euro-area countries in 1990 (22 percent of GDP) but lower than the average market capitalization in 1999 (84 percent of GDP) (see World Bank, 2001).

In the following, two interrelated approaches are used. First, the analysis will focus on the reaction of real private consumption to a specific event that has led to a one-time revaluation of equity prices, namely the official liberalization of these stock markets to foreign participation. Afterwards, structural consumption equations are estimated, which incorporate changes in equity prices.

B. Stock Market Liberalization and Private Consumption

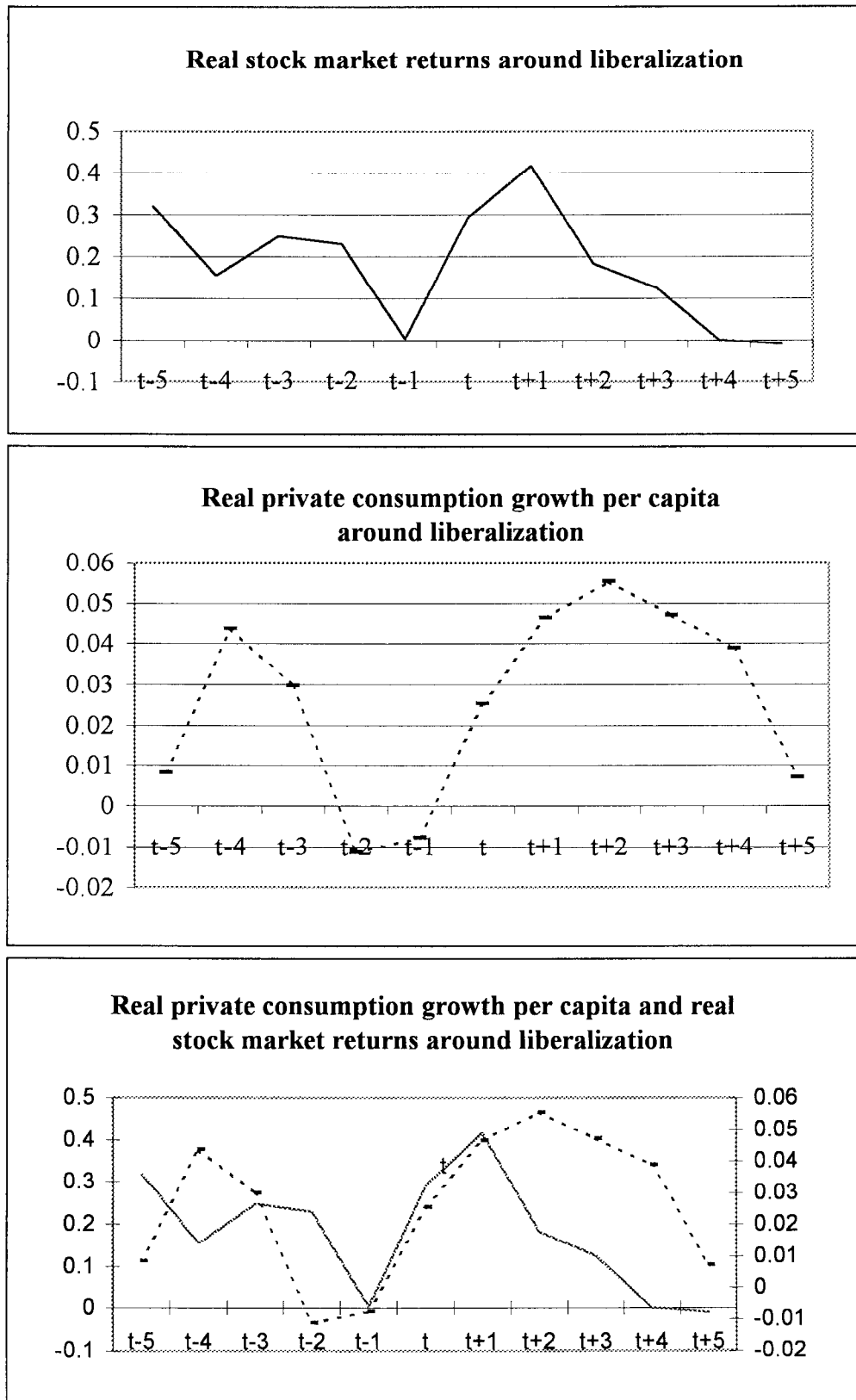
Events studies that assess the impact of an unanticipated increase in wealth on consumption can offer insights into the consumption—wealth relationship. Past studies used, for example, repatriation payments from Germany or unanticipated payments to a subset of U.S. veterans holding National Service Life Insurance policies as basis for a natural experiment (Carroll, 2001). Here, it is argued that the event of stock market liberalization may be interpreted as a similar event.

All of the countries in this study liberalized their stock markets during the last 15 years. A stock market liberalization, defined as foreign participation in domestic stock markets, is expected to lead to a one-time revaluation of equity prices. Even an announcement or rumors about liberalization may result in this effect. This is because as a country gets financially more integrated, the risk-free interest rate is expected to fall under plausible assumptions. Empirical analyses support theoretical predictions. Bekaert and Harvey (2000) find in a sample of 20 emerging markets that liberalization reduces the cost of capital. Using firm-level data, Chari and Henry (2002) show that a typical firm experiences a significant increase in Tobin's q around liberalization. In a panel of 12 countries, Henry (2000a) shows liberalization leads to abnormal returns of around 35 percent (cumulative) in the eight months preceding the liberalization. When controlling for fundamental macroeconomic changes, cumulative abnormal returns are still 26 percent. Kim and Singal (2000) also find that stock market liberalizations lead to significant increases in stock prices.

To demonstrate the dynamics of the development of real equity returns and the growth rate of real private consumption around the time of stock market liberalization, Figure 1 plots average real equity returns and the average growth rate of private consumption expenditure per

⁶ For a discussion of liberalization dates, see Fuchs-Schündeln and Funke (2001).

Figure 1. Real Equity Returns and Private Consumption Growth Per Capita (Log Scale)



capita (at constant prices) during the liberalization period. All returns are logarithmic. To obtain real dollar returns, each country's U.S. dollar total return is deflated by the U.S. consumer price index. In each case, the year t is the year of stock market liberalization for every country; $t-5$ depicts the situation five years before liberalization, and $t+5$ is the situation five years after liberalization. For example, the value on the y-axis corresponding to the x-axis value of t is the average growth rate of the respective variables across all countries in our sample in the respective year of liberalization. The growth rate is expressed as log differences, thus multiplying the value on the y-axis by 100 gives the growth rate in percent.

The graphs confirm that stock market liberalization was accompanied by a significant increase of equity returns and a smaller increase in real private consumption growth per capita. Equity prices have increased significantly in the year of liberalization, more than 40 percent in U.S. dollar terms on average. The increase prior to official liberalization may reflect that market participants anticipated the liberalization or that in some cases official liberalization was preceded by some liberalization efforts, for example, the introduction of a first country fund.

To test for the significance of the impact of liberalization, I create the dummy variables *lib* that take on the value 1 in the year of liberalization and 0 in all other years, and the variables *postlib(j)*, that take on the value 1 in the j the year after liberalization and 0 in all other years (see for example, Fuchs-Schündeln and Funke, 2001; Henry 2000b). A closer analysis of the data in our liberalization sample suggests that the effects generally peter out after a maximum of four years; therefore I initially include post-liberalization dummies up to year 5. In each case, the estimation is:

$$\ln \Delta X_{it} = \alpha_i + year_t + \beta_0 lib_{it} + \sum_{j=1}^5 \beta_j postlib(j)_{it} + \delta' Controls_{it} + \varepsilon_{it}$$

The dependent variable (ΔX_{it}) refers either to real equity returns or real private consumption growth per capita. The index i refers to the country and t denotes the time period. Cross-sectional fixed effects α_i are included to mitigate any potential omitted variable bias. Year dummies for every year account for worldwide effects. If liberalization has a positive effect on real equity returns or on real private consumption growth, we should see positive and significant β -coefficients. The control variables refer to explanatory variables suggested by economic theory and variables that take into account the implication of other reform measures. Following Henry (2000b), feasible GLS is used to account for possible cross-section heteroscedasticity in the error term. The weights are based on the estimated cross-section residual variances from a first stage pooled OLS regression. White's heteroscedasticity consistent covariance estimates is used. The variance estimator is robust to heteroscedasticity within each cross section.

To test for the significance of the liberalization on real equity returns and on real consumption growth, three different regressions for both variables are performed. In the first benchmark regressions in Table 2 (i, ii) both variables are regressed on the liberalization dummies, year dummies, and fixed effects. The second estimation explicitly controls for variables

Table 2. Equity Returns and Real Private Consumption Growth Per Capita: Impact of Financial Liberalization

	Model 1		Model 2		Model 3	
	Real Equity Return	Real Private Consumption Growth	Real Equity Return	Real Private Consumption Growth	Real Equity Return	Real Private Consumption Growth
	(i)	(ii)	(iii)	(iv)	(v)	(vi)
Lib	0.4565*** (0.1139)	0.0038 (0.0105)	0.3115*** (0.0947)	0.0261 (0.0058)	0.3159*** (0.0916)	0.0028 (0.0056)
Postlib1	0.0138 (0.0850)	0.0295*** (0.0099)		0.0194*** (0.0054)		0.0171*** (0.0057)
Postlib2	0.1639 (0.1120)	0.0319*** (0.0102)		0.0146*** (0.0051)		0.0133*** (0.0050)
Postlib3	0.0182 (0.0838)	0.0318*** (0.010)		0.0093** (0.0040)		0.0093*** (0.0034)
Postlib4	-0.0957 (0.0905)	0.01623 (0.0108)		0.0104** (0.0053)		0.0095* (0.0050)
Postlib5	-0.0478 (0.1190)	0.00139 (0.0100)		0.0028 (0.0044)		0.0033 (0.0045)
Real GDP growth per capita			0.5448 (0.7441)	0.9793*** (0.0370)	1.4785* (0.8200)	0.9506*** (0.0343)
Real GDP growth per capita (-1)			-2.228*** (0.7405)	-0.0420 (0.0285)	-0.5910 (0.7526)	-0.1125 (0.0842)
Real GDP growth per capita (+1)			5.4791*** (0.6814)		5.6978*** (0.5405)	
Dependent Variable (-1)					-0.2194*** (0.0692)	0.0848 (0.0848)
Dependent Variable (-2)					-0.2087*** (0.0619)	-0.0620 (0.0435)
Adj. R ²	0.30	0.18	0.45	0.72	0.69	0.73
Cumulative Impact of liberalization, (% and percentage points)	45.7	9.3	31.2	5.4	31.6	4.9

Note: The dependent variable is the real annual stock market return in U.S. dollars or the growth rate of real private consumption per capita in local currency. All regressions include country fixed effects and year dummies. Values in parentheses are standard errors. Due to data availability, the samples differ between the regressions. Regressions (i, iii, v) include 15 countries and 16 observations, regression (ii, iv and vi) 16 countries and 16 observations. Values in parentheses are standard errors.

***significant at the 1 percent significance level.

**significant at the 5 percent significance level.

*significant at the 10 percent significance level.

suggested by economic theory (iii, vi). The third specification also includes lagged dependent variables (v, vi).

In line with theoretical predictions, regressions indicate that the timing and the magnitude of the liberalization impact differ for financial variables and macroeconomic variables. Standard international asset pricing models suggest that a stock-market-liberalization-induced revaluation of equity prices occurs immediately at liberalization or in anticipation to liberalization. In line with this prediction, the dummy for the liberalization year for stock market returns is positive and significant but post-liberalization dummies are not significant. As most of the liberalizations occurred later during the year, the dummy also catches a revaluation immediately prior to liberalization and it may also capture other favorable unanticipated macroeconomic events that may occur after stock market liberalization. Without controlling for the influence of other economic developments (i), the liberalization is accompanied by a 45 percent increase of real equity returns but no effect in the following periods. An analysis of monthly stock price developments confirms these results. Henry (2000a) finds a 38 percent increase in the eight months prior to liberalization in a sample of 12 countries. He also presents evidence for a stock price revaluation in the months after liberalization, hinting at favorable, unanticipated macroeconomic changes after liberalization. The slightly higher estimates in this paper appear to reflect different window lengths. Results based on annual data are reasonably close to monthly estimations and none of the policy conclusions are affected by the use of annual data.

In contrast to the anticipated and immediate effect on stock prices, the effect of stock market liberalization on the growth rate of real private consumption growth starts in the year after liberalization and lasts for three periods. Without explicitly controlling for other factors, the cumulative impact of stock market liberalization on private consumption growth amounts to 9.3 percentage points.

The second set of estimations includes other controls suggested by economic theory or economic fundamentals. In the case of stock market returns, a number of lags and leads of the growth rates of economic fundamentals are considered. Leads were included to capture the forward-looking nature of equity prices. After trying a number of specifications,⁷ the reported specification includes one-year lagged, current, and one-year leads of real GDP growth. The new estimate implies a total revaluation of 31.2 percent. Estimates hardly differed when more fundamentals were added. If GDP growth is added to the estimation of real private consumption growth, the cumulative impact of liberalization on consumption growth drops to 5.4 percent. The third series of estimations (v, vi) includes lagged dependent variables. The general pattern of the impact of liberalization, as well as the

⁷ The fundamentals included were GDP growth, broad money growth, domestic inflation, credit ratings, and trade openness.

magnitude, remains close to previous estimates. In all cases the associated R^2 are reasonable and comparable to other results.

Using for each variable the most conservative estimate (iii, v) “back-of-the-envelope calculations” suggest that a 10 percent increase in equity returns was on average accompanied by a 1.6 percentage point ($=4.9/31.2*10$) increase in consumption over a three-to-four-year period. Of course, these calculations may only be interpreted with some care. Fuchs-Schündeln and Funke (2001) show that stock market liberalization leads to higher growth, in particular to a strong transitory increase in real growth. Although regressions (iv, vi) include lagged real GDP growth per capita as explanatory variable, the increase in private consumption may still be a reflection of a liberalization-induced income effect or other contemporaneous reforms and not a wealth effect. When additionally including an interactive dummy for real GDP growth for the liberalization period, the cumulative impact on consumptions stays at 4.2 percentage points. Other variables that try to capture other fundamental factors did not turn out significant. However, more importantly, these independent regressions do not assess whether there is a direct relationship between both variables. The next section discusses this issue.

C. Estimation of Consumption Equations Incorporating Equity Price Fluctuations

In many cases there seems to be a close link between real consumption growth and real equity returns (Figure 2).

The econometric analysis for real private consumption growth per capita follows that for industrialized countries and includes stock market changes as explanatory variable (see e.g., Boone, Giorno, and Richardson, 1998). The general representation is:

$$\Delta \ln C_{it} = \alpha_i + year_t + \beta postliball4_{it} + \delta \Delta \ln Y_{it} + \varepsilon \Delta \ln S_{it} + \gamma' controls_{it} + \varepsilon_{it}$$

As the focus of the analysis is no longer on the liberalization period, a new dummy variable *postliball4* is created that takes on the value of 1 in the four years after liberalization. Real equity returns (ΔS) in country *i* are added as proxy for changes in financial wealth.

As before, different regressions are performed (Table 3). The first regression (i) includes the liberalization dummy and income per capita as explanatory variables. In the second estimation (ii) equity returns are added. The third regression (iii) also captures other fundamentals suggested by theory. To see whether the link between stock market developments and private consumption has changed over time, regressions (iv) and (v) present results for recent time horizons.

Figure 2. Real Equity Returns and Real Private Consumption Growth Per Capita

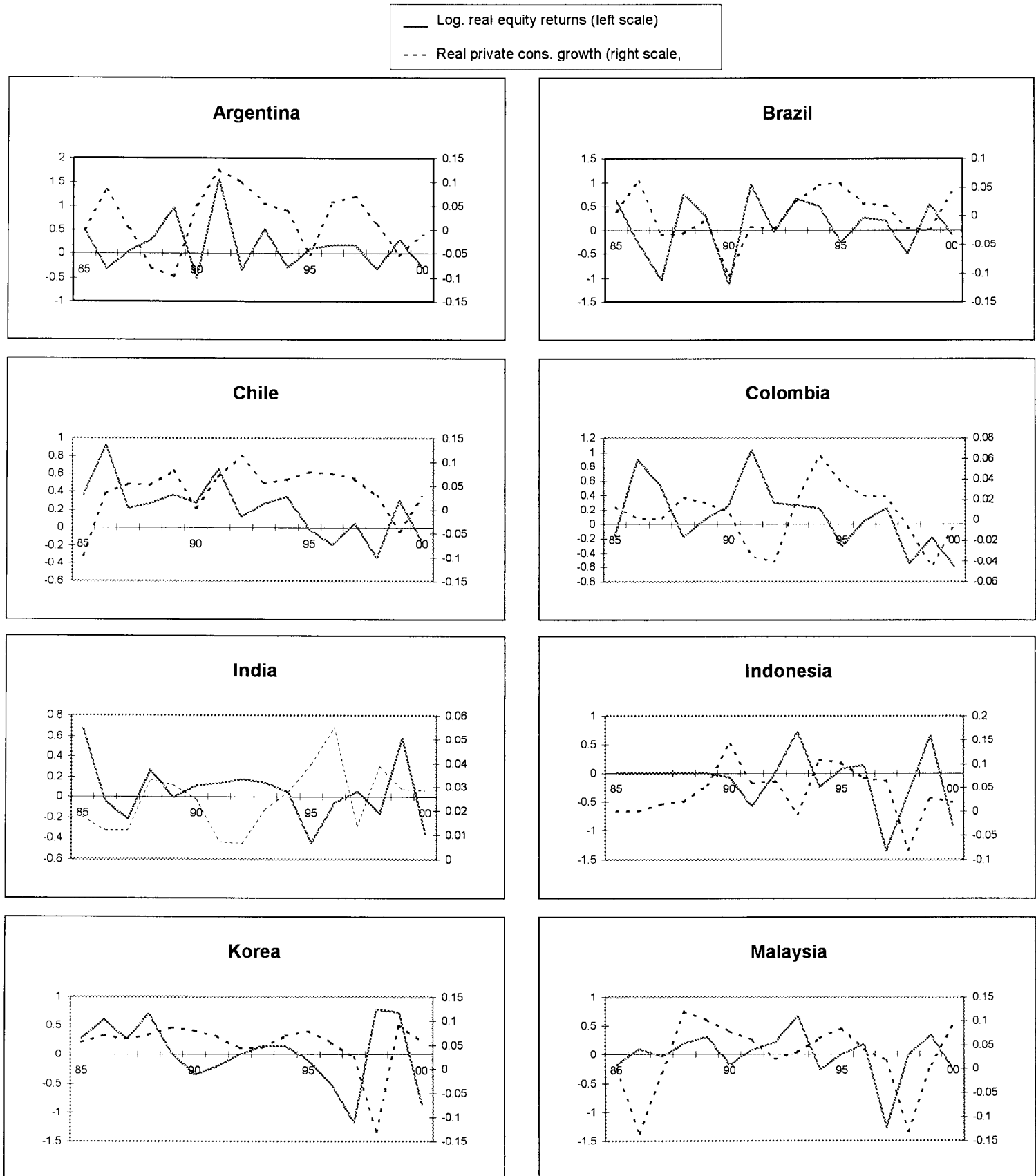
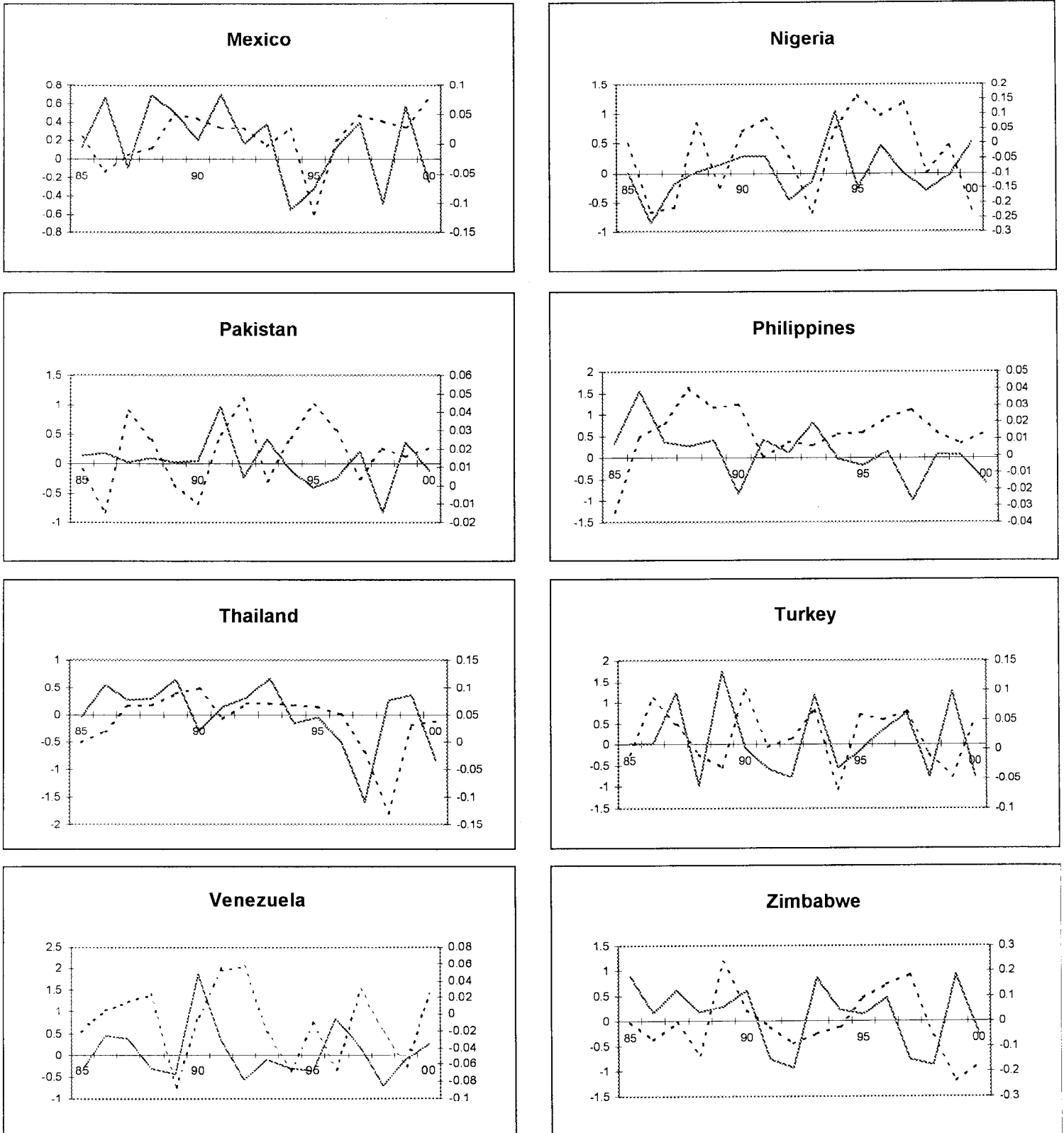


Figure 2 (cont.). Real Equity Returns and Real Private Consumption Growth Per Capita

— Log. real equity returns (left scale)
--- Real private cons. growth (right scale,



Most variables have the expected sign and most are significant. Coefficients on (lagged) equity returns are highly significant. Results for the 1985–2000 period (ii) suggest that a 10 percent increase in real equity returns in $t-1$ increases real private consumption on average by some 0.1–0.2 percent in the next year. Over a three-year period, the effect amounts to about 0.4 percent. This effect is smaller than the effects derived from corresponding estimates for the United States (0.45 percent to 0.62 percent) but closer to estimates for some other G-7 countries (see Boone, Giorno, and Richardson, 1998). The inclusion of real equity returns as explanatory variable in regression (ii) also reduces the direct liberalization effect to 0.79 percentage points per year during the first four years following liberalization, compared with an effect of 1.25 percentage points per year in (i). One interpretation is that around one-third of the liberalization effect on private consumption can be attributed to stock market developments.

In order to assess the importance of a number of other economic fundamentals suggested by theory, real interest rates, real changes in monetary growth, and other variables that aim at capturing consumer confidence have been included in the regressions. For most emerging markets consumer confidence measures are not available over a longer time period. Therefore, credit ratings from the *Institutional Investor* are used as proxy for confidence. Arguably, the rating variable may be endogenous and may be highly correlated with (expected) GDP or other reform variables. The magnitude and the significance of the coefficients on equity returns did not change substantially in any of the cases (results not reported here). The only variable that turns out to be significant is changes in ratings (iii).

The following two estimations (v, vi) present results for the 1990–95 and 1995–2000 observation periods.⁸ They present some indication that the estimated impact of a change in equity prices on private consumption has been higher during the 1990s than during the whole observation period. During this period, stock markets broadened and deepened importantly in developing countries. The impact is slightly smaller during the latter observation period, during which stock markets started to decline. The next section will analyze whether there are any asymmetries in the reaction to stock market changes.

⁸ A split of the sample into regional subgroups or, according to stock market size, broader stock markets, and countries with small stock did not lead to conclusive results. This may reflect that the stock market structure differs significantly across countries.

Table 3. Real Private Consumption Growth and Stock Market Developments

	1985–2000 (i)	1985–2000 (ii)	1985–2000 (iii)	1990–95 (iv)	1995–2000 (v)
Postliball4	0.0125*** (0.0030)	0.0079*** (0.0027)	0.0062** (0.0030)	0.0104** (0.0034)	0.0207*** (0.0035)
Real GDP growth	0.9724*** (0.0337)	0.9208*** (0.0354)	0.8632*** (0.0382)	0.7372*** (0.0094)	0.8897*** (0.0591)
Real GDP growth (-1)	-0.0524** (0.0026)	-0.1680*** (0.0031)	-0.1874*** (0.0379)	-0.1177** (0.0662)	-0.2844** (0.047)
Real Equity Return		-0.0004* (0.0021)	-0.0016 (0.0023)	0.0167*** (0.0061)	0.0004** (0.0022)
Real Equity Return (-1)		0.0148*** (0.0036)	0.017*** (0.0040)	0.0324*** (0.0061)	0.0222** (0.0076)
Real Equity Return (-2)		0.0184*** (0.0031)	0.0202*** (0.0035)	0.0271*** (0.0052)	0.0294*** (0.0069)
Real Equity Return (-3)		0.0109*** (0.0025)	0.0107*** (0.0028)	0.0163** (0.0032)	0.0027** (0.0027)
Change in Credit Rating			0.0010* (0.0057)		
Adj. R ²	0.74	0.78	0.79	0.77	0.86

The dependent variable is the growth rate of real private consumption per capita. All regressions include country fixed effects and year dummies. The sample comprises 16 countries. Values in parentheses are standard errors.

***significant at the 1% significance level.

**significant at the 5% significance level.

*significant at the 10% significance level.

D. Asymmetries in the Effect?

Negative or positive stock market fluctuations may have a different impact on private consumption, i.e., the effect is asymmetric. A number of arguments suggest that the reaction of consumers to stock price declines may be larger than the reaction to stock price / wealth increases (e.g., Shirvani and Wilbratte, 2000). First, capital gains taxation may result in asymmetries. In most economies a profitable sale of stocks is taxed, whereas the realization of a loss has no direct consequences for tax purposes (or losses may be tax deductible only to a certain extent). Therefore, the after-tax wealth effect of an x percent increase in stock prices on expenditure will be lower than the after-tax wealth effect of a x percent reduction in stock prices. For illustration purposes, Table 4 reports values for two planning horizons (20 years and 40 years) and four different interest rates assumptions. It is assumed that a wealth increase (\$1 increase) is taxed with a 30 percent capital gains tax, whereas no taxes or allowances are applicable in the case of a reduction in wealth. With a 5 percent interest rate, for example, an individual with a 40-year planning horizon may increase its annual consumer spending by 4.5 cents, for each \$1 addition in wealth. However consumer spending would decrease by 5.6 cents per year for each \$1 decline in wealth.

Table 4. Marginal Propensity to Consume Out of Wealth: Effect of Taxation 1/

Interest Before taxes (%)	Planning Horizon			
	Wealth increase (30% capital gain tax)		Wealth decrease	
	20 years	40 years	20 years	40 years
2.5	0.059	0.034	0.063	0.039
5	0.068	0.045	0.076	0.056
7.5	0.078	0.057	0.091	0.074
10	0.088	0.070	0.107	0.093

1/ Assumption: Consumers have no bequest motive and an individual wants to spend his / her entire increase in wealth (W), over time (t). Then $\Delta W = \sum_{t=0}^T \frac{\Delta C_t}{(1+r)(1-tax)^t}$, with a tax rate of 0.3 if $W > 0$ and tax = 0, if $W < 0$. For a similar table without the explicit distinction between wealth increases and decreases, see Poterba (2000).

Second, asymmetries may also result from liquidity constraints. In periods of “distress” liquidity constraints may lead to a situation where consumers find it difficult to borrow to increase consumption. Consumer spending may fall more sharply if stock prices decline, compared to a stock price rise, as it is easier for consumers to lend than to borrow. Third, asymmetries may be linked to utility considerations. With a declining marginal utility of wealth, consumers value a \$1 increase in wealth less than a \$1 decrease in wealth. Therefore, consumers may react more strongly to decreases in wealth than to increases in wealth.

The empirical evidence is inconclusive. Boone, Giorno, and Richardson (1998) do not identify significant asymmetries for the G-7 countries. Poterba (2000) also claims that there is no significant asymmetric reaction. However, Shirvani and Wilbratte (2000) suggest that the short-run impact of positive and negative wealth effects is not equal. Employing a model that relates consumption to income, money, and stock prices for Germany, Japan, and the United States, they find that consumption responds more strongly to stock price declines than to increases.

In general, the identification of asymmetric effects is complicated by the fact that policies may respond asymmetrically and try to counteract drastic declines in stock markets. For example, in the 1987 stock market decline as well as the most recent drop, the reaction of consumption was less pronounced than widely anticipated. In both cases monetary policies reacted quickly to the decline in stock markets, reducing interest rates and thus counteracting the potential negative wealth effects. Also, losses in stock market wealth may be compensated if other wealth components increase, such as housing market wealth. In addition, experience shows that periods of stock market declines have in most countries been short-lived, whereas price increases have persisted for longer periods. Therefore, as long as households do not face liquidity constraints they may postpone reacting to stock price declines.

To test for potential asymmetries, the econometric methodology is retained and a new dummy variable is added, which is 1 in all periods where real stock returns are positive. The dummy does not turn out to be significant (Table 5 (i)). Alternatively, positive changes of real stock returns are separated from negative changes of real stock returns (e.g., Shirvani and Wilbratte, 2001). For stock prices, DS+ is a series of annual positive changes in stock prices and zeros in the case of stock price declines. DS- includes all negative stock price changes and zeros otherwise. Again, results indicate that the effects of positive and negative changes tend to be symmetric (Table 5).

Table 5. Real Private Consumption Growth: Asymmetric Effects?

	All returns (i)	Positive returns (ii)	Negative returns (iii)
Postliball4	0.0079*** (0.00281)	0.0100*** (0.0029)	0.0107*** (0.0029)
Real GDP growth	0.9035*** (0.0381)	0.9533*** (0.0325)	0.9414*** (0.0349)
Real GDP growth (-1)	-0.1597*** (0.0327)	-0.107*** (0.0234)	-0.0964*** (0.0343)
Real equity return (or DS+ or DS-)	0.00156*** (0.0033)	-0.0079** (0.0037)	0.00434 (0.0033)
Real equity return (-1) (or DS+ or DS-)	0.1467*** (0.0042)	0.0138*** (0.0039)	0.0128** (0.0050)
Real equity return (-2) (or DS+ or DS-)	0.0221*** (0.0034)	0.0189*** (0.0033)	0.0182*** (0.0049)
Real equity return (-3) (or DS+ or DS-)	0.0124*** (0.0033)	0.0099*** (0.0031)	0.0067* 0.0041
Dummy positive returns	0.0038 (0.0030)		
Dummy positive returns (-1)	-0.0001 (0.0029)		
Dummy positive returns (-2)	0.0038 (0.0026)		
Dummy positive returns (-3)	0.00262 (0.00265)		
Adj. R ²	0.78	0.77	0.77

The dependent variable is the growth rate of real private consumption per capita. All regressions include country fixed effects and year dummies. The sample comprises 16 countries. Regressions include 16 observations; Values in parentheses are standard errors.

***significant at the 1% significance level.

**significant at the 5% significance level.

*significant at the 10% significance level

IV. CONCLUSION

This paper examines the relationship between stock market returns and private consumption in emerging markets with a cross-sectional time series data set. Estimates reported in this paper for a sample of 16 emerging markets provide evidence for a small, but statistically significant, relationship between stock market developments and private consumption. Private consumption does react to changes in stock market prices, and there is evidence that consumption has become more sensitive to stock market changes in the 1990s, but there is no significant evidence of asymmetries in the effect. As in the case of most other analyses on this topic, the simple regressions do allow for other interpretations, which, however, are difficult to separate. Yet, the interpretation of the results is consistent with fundamental theoretical predictions and in line with similar results for industrialized countries. Also, the sensitivity of the results to the choice of the time horizon and to the statistical specification mirror findings for industrialized countries.

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