Dynamics of the Current Account and Interest Differentials

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Abstract

In contrast to earlier work, we study the relation between the current account and interest rate differentials. To do so, we document the relation for international data. We then interpret this relation from a two-country, dynamic, general equilibrium environment. We finally confront the relation predicted by the environment to the relation observed in the data. We find that the environment correctly predicts that the current account is countercyclical; that the interest differential is procyclical; and that the current account is negatively correlated with current and future interest differentials, but positively correlated with past interest differentials.

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1. Introduction

The analysis of the current account and interest rate differentials have been major, yet separate enterprises. In fact, most studies ignore the relation between the current account and interest differentials. This is most surprising since intuition suggests that current accounts and interest rates jointly adjust to ensure the equilibria of both the world capital and good markets.

To fill this gap, we pursue three objectives. First, we document the relation between the business cycle fluctuations of the current account and of the interest differential for 10 developed economies over the post-1975 period. Our measure of the current account is the ratio of the current account to output. Our measure of the interest differential is the spread between country-specific and world interest rates. The country-specific interest rate is the ex-ante, short term, real interest rate, and the world interest rate is a weighted average of the country-specific rates.

Empirically, the current account is countercyclical, while the interest differential is procyclical. Also, the correlations between lags of the current account and the interest differential are negative, but the correlations between leads of the current account and the interest differential are positive, with the turning point usually occuring at the two-quarter lead. This asymmetric shape of the cross-correlation function resembles a horizontal S. This S-curve encompasses the negative relation between the current account and interest differential discussed in Bernhardsen (2000) and Lane and Milesi-Ferreti (2002). In addition, the S-curve is similar to the shape of the cross-correlation function for net exports and the terms of trade documented in Backus, Kehoe, and Kydland (1994).

Second, we construct a symmetric two-country, dynamic, general equilibrium environment. In the environment, countries engage in trade of a single homogenous good. This is similar to the specification used in the seminal work of Backus, Kehoe, and Kydland (1992), and thus offers a natural starting point for our analysis. Countries also engage in trade of one-period bonds only. This restriction is similar to the one used in Baxter and

Crucini (1995), and allows a straightforward computation of the current account. Finally, trades in the world capital market are costly. This is in the spirit of the debt-elastic interest rate specification used in Schmitt-Grohé and Uribe (2002), and implies the existence of interest differentials. In particular, we introduce a simple international financial intermediary. In equilibrium, the intermediary charges a higher rate to borrowers than the rate promised to lenders. This spread covers the intermediary's operating costs, and allow the intermediary to make a profit.

For plausible parameter values, the environment generates dynamic responses that hint at prominent predicted features. Specifically, following positive domestic shocks, the responses of the current account are generally negative, whereas the responses of the interest differential and output are positive. This suggests that the current account is countercyclical, while the interest differential is procyclical. Also, the shape of these responses suggests that the current account is negatively correlated with current and future interest differentials, in accord with the S-curve.

Third, we statistically confront the relation between the current account and the interest differential predicted by the environment to the relation observed in the data. The confrontation relies on the test procedure developed in Boileau and Normandin (2002). The observed relation corresponds to those found for the United States, an aggregate of the non-US countries, and the average of all 10 countries.

The environment predicts that the current account is countercyclical and that the interest differential is procyclical. These predictions statistically match the observations for the United States, the Non-US Aggregate, and the 10-Country Average. Also, the environment predicts an S-curve, with a turning point at the one-quarter lead. This S-curve statistically matches the S-curves of the United States for large values of lags and leads, of the Non-US Aggregate for low values of lags and leads, and of the 10-Country Average for low values of lags and large values of leads.

The plan of the paper is as follows. Section 2 documents the empirical regularities of the current account and the interest differential. Section 3 presents the economic environment. Section 4 reports test results. Section 5 concludes.

2. Empirical Regularities

We investigate the relation between the business cycle fluctuations of the current account and of the interest differential using postwar quarterly data for 10 developed countries.

2.1 Description of the Data

The data are fully described in Appendix A. The quarterly data covers the post-1975 period. The countries are Australia, Austria, Canada, Finland, France, Germany, Italy, Japan, the United Kingdom, and the United States. These countries are often considered in international real business cycle studies (e.g. Backus, Kehoe, and Kydland 1994), current account studies (e.g. Glick and Rogoff 1995), and interest differential studies (e.g. Lane and Milesi-Ferreti 2002). As a group, they account for 55 percent of the overall 1990 real gross domestic product of the 116 countries for which data are available in the Penn World Tables (Mark 5.6a).

Our definition of the current account is

$$x_t \equiv X_t / Y_t, \tag{1}$$

where X_t is the current account and Y_t is output. This measure is widely used in the current account literature (e.g. Taylor 2002).

Our definition of the interest differential is

$$d_t \equiv R_t - R_t^w, \tag{2}$$

where R_t is the ex-ante country-specific real gross return and R_t^w is the ex-ante world real gross return. The ex-ante real interest rate is the difference between the short-term nominal interest rate and the expected inflation rate. As in Nakagawa (2002), the short-term nominal interest rate is the rate on short lending between financial institutions. As in Barro and Sala-i-Martin (1990), the expected inflation rate is the one-quarter ahead predicted inflation rate from a univariate ARMA(1,1) process. The world interest rate is a weighted average of the country-specific interest rates, where the weights reflect the country's share of the overall real output of the 10 countries. This measure is useful since it yields one time series per country instead of several bilateral series per country.

Figure 1 plots the two variables for the United States and the Non-US Aggregate (the aggregate of the 9 remaining countries). The United States and the Non-US Aggregate are entities of roughly similar sizes. On average, the United States accounts for 43 percent of the 10-county output in our data, while the Non-US Aggregate accounts for 57 percent. The decomposition of the 10 countries into the United States and the Non-US Aggregate will prove useful in later sections.

As hoped, the current account of the United States and the Non-US Aggregate mirror each other well (the correlation is -0.70). By construction, the interest differential for the United State and the Non-US Aggregate also mirror each other well (the correlation is -1.00).

2.2 Features of the Data

We report the salient features of the business cycle fluctuations of the current account and of the interest differential. As is standard, we measure the business cycle using the fluctuations of the logarithm of output. As in Hodrick and Prescott (1997), the fluctuations correspond to the series detrended using the Hodrick-Prescott filter with a smoothing parameter of 1,600. In what follows, we report the features for the 10 countries, as well as for the Non-US Aggregate and the 10-Country Average (the mean statistic over the 10 countries).

Table 1 reports the relative volatility, the autocorrelation, and the correlation. The relative volatility corresponds to the ratio of the sample standard deviation of a variable to the sample standard deviation of output. The autocorrelation is the sample first-order serial correlation of a variable. Finally, the correlation is the sample contemporaneous correlation between variables.

First, the current account is less volatile than output, and the interest differential is even less volatile than the current account. The current account is less volatile than output in 9 out of the 10 countries. The relative volatility is 0.30 for the United States, 0.49 for the Non-US Aggregate, and 0.62 for the 10-Country Average. The interest differential is less volatile than the current account and much less volatile than output for all countries. The relative volatility is 0.10 for the United States, 0.14 for the Non-US Aggregate, and

0.19 for the 10-Country Average.

Second, the current account and the interest differential display a fair amount of persistence, but this persistence is less than that of output. The autocorrelation of the current account is above 0.50 for 6 out of the 10 countries. The autocorrelation is 0.65 for the United States, 0.59 for the Non-US Aggregate, and 0.51 for the 10-Country Average. The autocorrelation of the interest differential is above 0.50 for 8 out of the 10 countries. The autocorrelation is 0.54 for the United States, 0.52 for the Non-US Aggregate, and 0.54 for the 10-Country Average. In comparison, the autocorrelation of output is above 0.50 for 9 out of the 10 countries. The autocorrelation is 0.90 for the United States, 0.76 for the Non-US Aggregate, and 0.74 for the 10-Country Average.

Third, the current account is countercyclical, while the interest differential is procyclical. The correlation between the current account and output is negative for all countries. The correlation is -0.48 for the United States, -0.28 for the Non-US Aggregate, and -0.25 for the 10-Country Average. The correlation between the interest differential and output is positive for 7 out of the 10 countries. The correlation is 0.13 for the United States, 0.04 for the Non-US Aggregate, and 0.11 for the 10-Country Average.

Fourth, the current account is negatively correlated with the interest differential. The current account and the interest differential are negatively correlated for 7 out of the 10 countries. The correlation is 0.09 for the United States, -0.09 for the Non-US Aggregate, and -0.08 for the 10-Country Average.

To further explore the comovements between the current account and the interest differential, Figure 2 displays the dynamic sample cross-correlation function between the two variables. The function shows an asymmetric shape for 9 out of the 10 countries. That is, the correlations between lags of the current account and the interest differential are negative, but the correlations between leads of the current account and the interest differential are positive, with the turning point usually occuring at the two-quarter lead. The turning point occurs earlier for two countries (Italy and the United States) and later for one country (Germany). The asymmetric shape occurs with a contemporaneous turning point for the United States, with a two-quarter lead for the Non-US Aggregate, and with a two-quarter lead for the 10-Country Average.

Interestingly, the asymmetric shape is similar to the S-curve documented in Backus, Kehoe, and Kydland (1994). That is, the cross-correlation function between net exports and the terms of trade display an asymmetric shape, where correlations between lags of net exports are negatively correlated with the terms of trade, but leads of net exports are positively correlated with the terms of trade.

2.3 Robustness

We verify the robustness to the specifications of the univariate inflation process used to construct real interest rates and to the selections of the method used to detrend variables. Although not reported, the features are robust to different aggregations for the world interest rate. In particular, the features hold if we define the world interest rate as the aggregate of the G7 countries or the aggregate of Europe and the United States.

Table 2 presents the relative volatility, autocorrelation, and correlation of the 10-Country Average for four inflation processes and two detrending methods. Our baseline treatment involves constructing the expected inflation rate from a univariate ARMA(1,1) process. We also experiment with AR(1), AR(4), and ARMA(2,2) processes. Our baseline treatment involves detrending all variables with the Hodrick-Prescott filter. We also detrend the data by removing a linear-quadratic trend.

Interestingly, the salient features remain for all combinations. First, both the current account and the interest differential are less volatile than output. Second, the current account and the interest differential are fairly persistent, but this persistence is less than that of output. Third, the current account is countercyclical and the interest differential is procyclical. Fourth, the current account is negatively correlated with the interest differential.

Figure 3 presents the cross-correlation function between the current account and the interest differential of the 10-Country Average for the four inflation processes and the two detrending methods. The S-curve prevails for all combinations. In particular, the asymmetric shape is pronounced when the different inflation processes are combined with the Hodrick-Prescott filter. The asymmetric shape, however, is less pronounced when the different inflation processes are combined with the linear-quadratic trend. For these cases, the correlations between lags of the current account and the interest differential are negative, while the correlations between leads of the current account and the interest differential rise, such that the overall shape is suggestive of the S-curve.

3. The Economic Environment

We study a symmetric two-country, dynamic, general equilibrium environment where costly international financial transactions are brokered by a financial intermediary. Foreign country variables are identified by an asterisk.

3.1 The Home Economy

The home economy is populated by a representative consumer, a representative firm, and a government. The consumer's expected lifetime utility is

$$E_0\left\{\sum_{t=0}^{\infty}\beta^t U\big(C_t, N_t\big)\right\}, \tag{3}$$

where E_t is the conditional expectation operator, C_t is consumption, N_t is employment, and $0 < \beta < 1$. As in Greenwood, Hercowitz, and Huffman (1988), the momentary utility is $U(C_t, N_t) = (C_t - \eta N_t^{\nu})^{(1-\sigma)}/(1-\sigma)$, where $\eta > 0$, $\nu > 1$, and $\sigma \geq 1$. We adopt this formulation because it may resolve two important shortcomings of homogenous good multi-country models. As Backus, Kehoe, and Kydland (1992) document, these models incorrectly predict that net exports are procyclical and that consumption is highly correlated across countries. The Greenwood, Hercowitz, and Huffman (1988) preferences may alleviate these problems for two reasons. First, Correia, Neves, and Rebelo (1995) show that these preferences promote a countercyclical trade balance in small open-economies. This may extend to the current account in one-good two-country models. Second, Devereux, Gregory, and Smith (1992) find that these preferences reduce the cross-country correlation of consumption in one-good two-country models.

The consumer's budget constraint is

$$C_t + I_t + T_t + q_t B_{t+1} = W_t N_t + r_t^k K_t + B_t, \tag{4}$$

where I_t denotes investment, T_t is taxes, W_t is the wage rate, r_t^k is the rental rate of capital, K_t is the capital stock, B_t is the stock of short-term bonds, and q_t is the price of the home short-term bonds. The capital stock evolves according to

$$K_{t+1} = I_t + (1-\delta)K_t - \left(\frac{\phi}{2}\right)\left[\frac{I_t}{K_t} - \delta\right]^2 K_t, \tag{5}$$

where the last term is an adjustment cost with $\phi \geq 0$ and $0 < \delta < 1$. We add adjustment costs to resolve another shortcoming of one-good two-country models. As Backus, Kehoe, and Kydland (1992) document, these models incorrectly predict a large volatility of investment. Baxter and Crucini (1993), however, show that investment adjustment costs limit the volatility of investment.

The competitive consumer chooses consumption, employment, capital and bonds to maximize expected lifetime utility (3) subject to the constraints (4) and (5). The first-order conditions of the consumer's problem are

$$\lambda_t = U_{ct}, \tag{6.1}$$

$$U_{nt} = -\lambda_t W_t, \tag{6.2}$$

$$q_t \lambda_t = \beta E_t \left\{\lambda_{t+1}\right\}, \tag{6.3}$$

$$\begin{aligned} \frac{\lambda_t}{\left[1-\phi\left(\frac{I_t}{K_t}-\delta\right)\right]} = \beta E_t \Bigg\{ & \frac{\lambda_{t+1}}{\left[1-\phi\left(\frac{I_{t+1}}{K_{t+1}}-\delta\right)\right]}\Bigg(r_{t+1}^k\left[1-\phi\left(\frac{I_{t+1}}{K_{t+1}}-\delta\right)\right] + (1-\delta) \\ & - \frac{\phi}{2}\left(\frac{I_{t+1}}{K_{t+1}}-\delta\right)^2 + \phi\left(\frac{I_{t+1}}{K_{t+1}}-\delta\right)\frac{I_{t+1}}{K_{t+1}}\Bigg)\Bigg\}, \end{aligned} \tag{6.4}$$

where U_{ct} and U_{nt} are the partial derivatives of $U(C_t, N_t)$ with respect to C_t and N_t, and λ_t is the multiplier associated with the budget constraint (4).

The firm's profits are

$$Y_t - W_t N_t - r_t^k K_t, \tag{7}$$

where Y_t denotes the firm's output. As is standard, output is produced with the constant return to scale technology

$$Y_t = Z_t K_t^{\alpha} N_t^{1-\alpha}, \tag{8}$$

where Z_t is the stochastic, exogenous, level of technology and $0 < \alpha < 1$.

The competitive firm hires labor and capital to maximize profits (7), subject to the production technology (8). The first-order conditions of the firm's problem are

$$W_t = (1-\alpha)Y_t/N_t, \tag{9.1}$$

$$r_t^k = \alpha Y_t/K_t. \tag{9.2}$$

The government runs a balanced budget:

$$\mathcal{G}_t = T_t + \omega_t \Pi_t, \tag{10}$$

where $\mathcal{G}_t$ is government expenditures, $\omega_t = Y_t/(Y_t + Y_t^*)$ is the home share of world output, and Π_t is any redistributed profits from the financial intermediary. Implicitly, the intermediary is owned by the governments of each country, and the ownership shares reflect each country's share of world output. Note that our results are not sensitive to the exact redistribution of the intermediary's profits.

3.2 The International Financial Market

The international financial market is operated by a financial intermediary. The intermediary's profits are

$$\Pi_t = q_t B_{t+1} + q_t^* B_{t+1}^* - B_t - B_t^* - \Phi_{t+1}, \tag{11}$$

where Φ_{t+1} represents various costs faced by the intermediary. These costs are used to introduce international financial frictions. The costs are increasing in the net foreign asset positions of both countries (which corresponds to the amount of funds handled by the intermediary): $\Phi_{t+1} = (\varphi/2)\left(B_{t+1}^2/Y_t + B_{t+1}^{*2}/Y_t^*\right)$, where $\varphi \geq 0$. We adopt this formulation because it yields interest differentials that are consistent with those imposed in previous work. The intermediary lends all funds:

$$B_{t+1} + B_{t+1}^* = 0. \tag{12}$$

Finally, there is no entry in the intermediation sector. Note that our results are robust to alternative modeling of the financial intermediary. In particular, we obtain similar results if we introduce private ownership with fixed costs to eliminate profits.

The price-taking financial intermediary chooses bonds to maximize profits (11) subject to the lending constraint (12). The first-order condition of the intermediary's problem is

$$(q_t - q_t^*)B_{t+1} = \varphi \left(B_{t+1}^2/Y_t + B_{t+1}^{*2}/Y_t^* \right)$$

or

$$\left(\frac{R_{t+1}^* - R_{t+1}}{R_{t+1}R_{t+1}^*} \right) B_{t+1} = \varphi \left(B_{t+1}^2/Y_t + B_{t+1}^{*2}/Y_t^* \right), \tag{13}$$

where $R_{t+1} = 1/q_t$ and $R_{t+1}^* = 1/q_t^*$ are the home and foreign gross returns on bonds. This condition is easily interpreted: the intermediary charges a higher rate to borrower than the rate promised to lenders. Using this strategy, the intermediary generates a profit of $\Pi_t = (\varphi/2) \left(B_{t+1}^2/Y_t + B_{t+1}^{*2}/Y_t^* \right)$.

The interest differential used to document the empirical regularities is $d_t = R_t - R_t^w$, where the world return is $R_t^w = \omega_t R_t + \omega_t^* R_t^*$. These definitions and the intermediary's first-order condition imply:

$$d_t = -\varphi R_t R_t^* \left(\frac{\omega_t^*}{\omega_{t-1}^*} \right) \frac{B_t}{Y_{t-1}}. \tag{14}$$

This differential is similar to that imposed in Nason and Rogers (2002): $d_t = -\widetilde{\varphi} B_t/Y_t$. Our empirical results are robust to this change in specification.

The differential in equation (14) is decreasing in the ratio of net foreign assets to output. In previous work, interest differentials are imposed to be inversely related to the level of net foreign assets (Devereux and Smith 2003; Schmitt-Grohé and Uribe 2002), to the ratio of net foreign assets to exports (Senhadji 1997), and to the ratio of net foreign assets to output (Letendre 2002; Nason and Rogers 2002). Interestingly, Lane and Milesi-Ferreti (2002) find empirical support for interest differentials that are decreasing in the net foreign assets to exports ratio.

Finally, the good market clearing condition is

$$C_t + C_t^* + I_t + I_t^* + G_t + G_t^* = Y_t + Y_t^*. \tag{15}$$

where $G_t = \mathcal{G}_t + \omega_t \Phi_{t+1}$ and $G_t^* = \mathcal{G}_t^* + \omega_t^* \Phi_{t+1}$. That is, we roll the resources lost in operating the international financial markets with government expenditures, and use

G_t and G_t^* as our notion of stochastic, exogenous, government expenditures. Again, our results are not sensitive to the exact redistribution of the resources lost in operating the international financial market. In addition, we obtain similar findings when the resources lost are modeled as output lost in production.

3.3 Calibration

The economic environment does not possess an analytical solution for general values of the underlying parameters. We approximate the solution using the method described in King, Plosser, and Rebelo (2002). That is, we linearize the equations characterizing the equilibrium around the deterministic steady state, and solve the resulting system of difference equations. In our environment, the law of motion for bonds is stationary because of the intermediary's quadratic costs. The stationarity could also be achieved by forcing quadratic costs on bond holdings, as in Heathcote and Peri (2002). Finally, we calibrate the values of all underlying parameters.

To explain our baseline calibration, we divide the parameters in three sets. The first set is calibrated on values used in previous studies. As in Backus, Kehoe, and Kydland (1992), we set the subjective discount factor to $\beta = 0.99$, the share of capital to $\alpha = 0.36$, the depreciation rate to $\delta = 0.025$, and the steady state employment to 30 percent of the time endowment (which requires that $\eta = 3.24$). As in Greenwood, Hercowitz, and Huffman (1988) and Correia, Neves, and Rebelo (1995), we set the coefficient of relative risk aversion to $\sigma = 2$ and the elasticity of labor supply to $1/(\nu - 1) = 1.43$. Finally, as in Nason and Rogers (2002), we set the responsiveness of the interest differential to changes in the net foreign asset position to $\widetilde{\varphi} = 0.0035$. In our case, $\widetilde{\varphi} = \varphi/\beta^2$, because the linearized version of the differential is $d_t \approx -\varphi R^2 B_t / Y$, where Y and $R = 1/\beta$ are the deterministic steady state values of output and gross return. The linearization is this simple because the symmetric deterministic steady state implies $B = 0$.

The second set of parameters is calibrated to match observed statistics for the United States. For example, we set $G/Y = 0.163$ to match the average sample output share of government expenditures in the United States. Note that $G/Y = \mathcal{G}/Y$ because $\Phi = \Pi = B = 0$. In addition, we set $\phi = 3.75$ to match the relative volatility of investment in the

United States. Also, we have experimented with matching these statistics for the Non-US Aggregate and the 10-Country Average with similar results.

The last set of parameters is calibrated to estimated values for the United States and the Non-US Aggregate. This is in line with our two country symmetrical environment, because the United States and the Non-US Aggregate are of similar size. We calibrate the parameters of the symmetric process that generates the stochastic, exogenous, technology and government expenditures to maximum likelihood estimates. The process is

$$\begin{pmatrix} z_t \\ z_t^* \\ g_t \\ g_t^* \end{pmatrix} = \begin{pmatrix} \gamma_{zz} & \gamma_{zz}^* & \gamma_{zg} & \gamma_{zg}^* \\ \gamma_{zz}^* & \gamma_{zz} & \gamma_{zg}^* & \gamma_{zg} \\ \gamma_{gz} & \gamma_{gz}^* & \gamma_{gg} & \gamma_{gg}^* \\ \gamma_{gz}^* & \gamma_{gz} & \gamma_{gg}^* & \gamma_{gg} \end{pmatrix} \begin{pmatrix} z_{t-1} \\ z_{t-1}^* \\ g_{t-1} \\ g_{t-1}^* \end{pmatrix} + \begin{pmatrix} \epsilon_{zt} \\ \epsilon_{zt}^* \\ \epsilon_{gt} \\ \epsilon_{gt}^* \end{pmatrix}$$

or

$$\mathbf{w}_t = \Gamma \mathbf{w}_{t-1} + \mathbf{e}_t, \tag{16}$$

for $\mathbf{w}_t = (\, z_t \quad z_t^* \quad g_t \quad g_t^* \,)'$, $z_t = \ln(Z_t/Z)$, $z_t^* = \ln(Z_t^*/Z)$, $g_t = \ln(G_t/G)$, and $g_t^* = \ln(G_t^*/G)$, where Z and G are the steady state values of technology and government expenditures. The covariance matrix $E\left[\mathbf{e}_t \mathbf{e}_t'\right] = \Upsilon$ is

$$\Upsilon = \begin{pmatrix} \upsilon_{zz} & \upsilon_{zz}^* & \upsilon_{zg} & \upsilon_{zg}^* \\ \upsilon_{zz}^* & \upsilon_{zz} & \upsilon_{zg}^* & \upsilon_{zg} \\ \upsilon_{zg} & \upsilon_{zg}^* & \upsilon_{gg} & \upsilon_{gg}^* \\ \upsilon_{zg}^* & \upsilon_{zg} & \upsilon_{gg}^* & \upsilon_{gg} \end{pmatrix}. \tag{17}$$

The estimates for Γ are $\gamma_{zz} = 0.720$, $\gamma_{zz}^* = 0.069$, $\gamma_{zg} = 0.108$, $\gamma_{zg}^* = -0.006$, $\gamma_{gg} = 0.722$, $\gamma_{gg}^* = 0.017$, $\gamma_{gz} = 0.022$, and $\gamma_{gz}^* = -0.085$. The estimates for Υ are $\upsilon_{zz} = 5.390 \times 10^{-5}$, $\upsilon_{zz}^* = 1.085 \times 10^{-5}$, $\upsilon_{zg} = 1.363 \times 10^{-5}$, $\upsilon_{zg}^* = 1.110 \times 10^{-5}$, $\upsilon_{gg} = 4.370 \times 10^{-5}$, and $\upsilon_{gg}^* = 2.529 \times 10^{-6}$.

4. Test Results

We gauge whether the features of the current account and the interest differential predicted by the economic environment explain the salient features documented for our post-1975 sample of international data.

4.1 Dynamic Responses

As a useful starting point, we document the dynamics predicted by the economic environment with the baseline calibration. To do so, Figure 4 displays the dynamic responses of various domestic variables to orthogonal, domestic, technology and government expenditures shocks. The key variables are output, the current account, and the interest differential. The current account is decomposed into the national saving to output ratio and the investment to output ratio.

An increase in technology raises output, and stimulates both savings and investment. Savings, however, does not rise enough to fully fund the investment boom, such that the current account deteriorates. The deterioration worsens the country's net foreign asset position and pushes up the interest differential. Also, an increase in government expenditures eventually raises output, reduces savings, but raises investment. This implies a deterioration of the current account. The deterioration worsens the net foreign asset position and raises the interest differential.

These responses hint at prominent predicted features. First, the responses of the current account are smaller than those of output, and the responses of the interest differential are even smaller. This suggests that the current account is less volatile than output, and that the interest differential is even less volatile. Second, the responses of the current account appear slightly less persistent than those of output, while the hump-shaped responses of the interest differential are more persistent. This suggests that the current account is less persistent than output, while the interest differential is more persistent. Third, the responses of the current account are generally negative, whereas the responses of the interest differential and output are positive. This suggests that the current account is countercyclical, while the interest differential is procyclical. Fourth, the responses of the current account and of the interest differential suggest that these variables are negatively correlated. Fifth, the responses suggest that the current account is also negatively correlated with future interest differentials. It is difficult, however, to deduce the entire shape of the S-curve from the responses, because of the inherent differences between response functions and cross-correlation functions.

Overall, the dynamics of the environment's key variables provide intuition behind the predicted business cycle features of the current account and the interest differential. Interestingly, these features seem consistent with most of the empirical regularities.

4.2 Features of the Current Account and the Interest Differential

We now proceed to the central part of our analysis. That is, we perform challenging statistical tests to confront the predicted features of the current account and the interest differential to the observed features. The tests are based on the approach described in Boileau and Normandin (2002).

Table 3 compares the predicted statistics to observed statistics. The predicted statistics are computed from the baseline calibration of the underlying parameters. The observed statistics are those of the United States, the Non-US Aggregate, and the 10-Country Average. In each case, the table also presents the p-value from a $\chi^2(1)$ distributed test that the difference between predicted and observed statistics is null. The test uses the variance of the difference, which is computed as $D'\Sigma D$— where D is the vector of numerical derivatives of the difference with respect to the estimated parameters in Γ and Υ, and Σ is the covariance matrix of these estimates.

First, the economic environment numerically and statistically predicts the relative volatility of the current account, but underpredicts the relative volatility of the interest differential. The predicted relative volatility of the current account is 0.27. In comparison, the relative volatility (p-value) observed in the data is 0.30 (0.82) for the United States, 0.49 (0.17) for the Non-US Aggregate, and 0.62 (0.04) for the 10-Country Average. The predicted relative volatility of the interest differential is 0.01. The relative volatility (p-value) observed in the data is 0.10 (0.00) for the United States, 0.14 (0.00) for the Non-US Aggregate, and 0.19 (0.00) for the 10-Country Average.

Second, the environment numerically and statistically predicts the persistence of the current account, but overpredicts the persistence of the interest differential. The predicted autocorrelation of the current account is 0.70. The observed autocorrelation (p-value) is 0.65 (0.42) for the United States, 0.59 (0.09) for the Non-US Aggregate, and 0.51 (0.00) for the 10-Country Average. The predicted autocorrelation of the interest differential is 0.99, while the observed autocorrelation (p-value) is 0.54 (0.00) for the United States, 0.52

(0.00) for the Non-US Aggregate, and 0.54 (0.00) for the 10-Country Average.

Third, the environment correctly predicts that the current account is countercyclical and that the interest differential is procyclical. The predicted correlation between the current account and output is -0.22. The observed correlation (p-value) is -0.48 (0.01) for the United States, -0.28 (0.55) for the Non-US Aggregate, and -0.25 (0.77) for the 10-Country Average. The predicted correlation between the interest differential and output is 0.18. The observed correlation (p-value) is 0.13 (0.86) for the United States, 0.04 (0.57) for the Non-US Aggregate, and 0.11 (0.71) for the 10-Country Average.

Fourth, the environment correctly predicts the frequently observed negative correlation between the current account and the interest differential. The predicted correlation is -0.07, while the observed correlation (p-value) is 0.09 (0.00) for the United States, -0.09 (0.03) for the Non-US Aggregate, and -0.08 (0.08) for the 10-Country Average.

Figure 5 compares the predicted dynamic cross-correlation function between the current account and the interest differential to observed cross-correlation functions. The predicted correlations are computed from the baseline calibration of the underlying parameters. The observed cross-correlation functions are those of the United States, the Non-US Aggregate, and the 10-Country Average. In each case, the figure also presents the p-value from a $\chi^2(1)$ distributed test that the difference between predicted and observed statistics is null.

The environment predicts a sharp S-curve: the predicted correlations between lags of the current account and the interest differential are negative, and the correlations between leads of the current account and the interest differential are positive, with the turning point occuring at the one-quarter lead. The observed cross-correlation function for the United States displays the overall shape, but the turning point occurs at the two-quarter lag. Thus, the predicted cross-correlations statistically match the observed cross-correlations only for large values of leads and lags. The observed function for the Non-US Aggregate displays the S-curve with a turning point at the two-quarter lead. The predicted cross-correlations statistically match the observed correlations for low values of lags and leads. The observed function for the 10-Country Average also displays the S-curve with a turning point at the two-quarter lead. The predicted cross-correlations statistically match the observed ones for low values of lags and large values of leads.

Overall, the environment numerically and statistically predicts most of the empirical regularities. The current account and the interest differential are less volatile than output, and both are persistent. The current account is countercyclical, while the interest differential is procyclical. The dynamic cross-correlation function between the current account and the interest differential displays an S-curve with a negative contemporaneous correlation. Unfortunately, the environment incorrectly predicts a few empirical regularities. In particular, the predicted relative volatility of the interest differential is one tenth of the observed relative volatility.

These results parallel those for net exports and the terms of trade documented in Backus, Kehoe, and Kydland (1994). Furthermore, our environment explains the standard international business cycle statistics as well as the environment in Backus, Kehoe, and Kydland (1994) — see Appendix Tables B1 and B2. In this sense, our explanation of the relation between the current account and the interest differential does not come at the cost of a deterioration in the standard statistics.

4.3 Robustness

We finally verify the robustness of our results, and pay particular attention to the predicted features of the interest differential. For this purpose, we conduct several experiments with alternative calibrations of the key parameters. The different experiments are reported in Table 4 and Figure 6. In each case, the table (figure) also shows the p-value of the test that the difference between predicted and 10-Country Average statistics (correlations) is null.

The first experiment verifies the effects of changing the coefficient of relative risk aversion. Intuition suggests that an increase in the coefficient magnifies the volatility of the marginal utility of consumption. This should raise the volatility of the interest differential. We lower the coefficient to $\sigma = 1$ (the logarithmic utility) and raise it to a high of $\sigma = 10$. These values are consistent with the range studied in Mehra and Prescott (1985). Unfortunately, raising the coefficient of relative risk aversion has only negligible effects on the relative volatility and persistence of the interest differential. In addition, it makes the interest differential countercyclical and flattens the cross-correlation function. Finally, it has only small effects on the statistics of the current account.

The second experiment verifies the effects of changing the elasticity of labor supply. Raising the elasticity should make employment and the marginal utility of consumption more volatile. This should raise the volatility of the interest differential. We lower the elasticity to $1/(\nu - 1) = 0.2$ and raise it to $1/(\nu - 1) = 2.5$. These values are consistent with the range discussed in Greenwood, Hercowitz, and Huffman (1988). Unfortunately, changing the elasticity of labor supply has negligible effects on the statistics and cross-correlation function of the interest differential and current account.

The third experiment verifies the effects of changing the cost of adjusting the capital stock. A reduction of the cost should raise the volatility of international capital flows, and thus the volatility of the interest differential. For this experiment, we lower the cost by setting $\phi = 0$ and raise it by setting $\phi = 7.5$. These values either eliminate the cost or double it (for a given investment). As expected, lowering the cost raises the relative volatility of the interest differential and lowers its persistence. It also makes the cross-correlation function steeper around the turning point. Unfortunately, lowering the cost unreasonably raises the relative volatility of the current account and makes it procyclical.

The last experiment verifies the effects of changing the responsiveness of the interest differential to the ratio of net foreign assets and output. An increase in the responsiveness should raise the volatility of the interest differential. We lower the responsiveness to $\varphi/\beta^2 = 0.001$ and raise it to $\varphi/\beta^2 = 0.01$. These values are consistent with those found in Lane and Milesi-Ferreti (2002) and used in Devereux and Smith (2003). The increase slightly raises the relative volatility of the interest differential and lowers its persistence. It also raises the steepness of the cross-correlation function and makes the interest differential more procyclical. Finally, it has only small effects on the statistics of the current account.

In sum, the various experiments confirm that our results are robust. They also suggest that matching the anomalous volatility of the interest differential is a difficult task.

5. Conclusion

In contrast to earlier work, we document the business cycle fluctuations of the current account and interest differentials. We find that our two-country, dynamic, general equilibrium environment correctly predicts the relation between the key variables. That is, the current account is countercyclical; the interest differential is procyclical; and the current account is negatively correlated with current and future interest differentials, but positively correlated with past interest differentials. Unfortunately, we also find that the environment underpredicts the volatility of the interest differential.

Future work should aim at resolving the discrepancies between facts and predictions. Promising extensions should consider the effects of the real exchange rate (terms of trade) and government budgets. For example, Sachs (1981) finds evidence that the exchange rate affects the current account, and Baxter (1994) finds evidence that it affects interest differentials. Also, Normandin (1999) shows that government budgets impact the current account, while Bernhardsen (2000) shows that they impact interest differentials.

Appendix A: Data

The quarterly seasonally adjusted measures are constructed for 10 developed countries and a Non-US Aggregate over the post-1975 period. The measures are computed from the International Financial Statistics (IFS) released by the International Monetary Funds, as well as the Main Economic Indicators (MEI) and the Quarterly National Accounts (QNA) published by the Organization for Economic Cooperation and Development. The individual countries (common samples for all measures) are Australia (1975-I to 2001-II), Austria (1975-I to 1998-IV), Canada (1975-I to 2001-II), Finland (1978-I to 2001-II), France (1975-I to 1999-I), Germany (1975-I to 2001-II), Italy (1975-I to 2001-II), Japan (1977-I to 2001-II), the United Kingdom (1975-I to 2001-II), and the United States (1975-I to 2001-II). Germany refers to West Germany and Unified Germany for the pre- and post-1990 periods. The Non-US Aggregate covers the 1975-I to 2001-II period.

A.1 Output

For each country, output is measured by the weighted nominal gross domestic product (GDP) in national currency (source: QNA), deflated by the all-item consumer price index (CPI) for the baseyear 1995 (source: MEI). The output weights are country-specific constants that convert the values of output into comparable units. Following Backus, Kehoe, and Kydland (1992), the constants are chosen to match the averages of our quarterly values of output in 1985 to the yearly data on real GDP obtained from the international prices for 1985, reported by Summers and Heston (1988) (source: variables 1 and 2 in their Table 3). The published data for Germany and Austria are not seasonally adjusted. Thus, German and Austrian output is regressed (by OLS) on quarter dummies to remove seasonality. For the Non-US Aggregate, output is constructed by summing over all countries, except the United States.

A.2 Current Account

For each country, the current account is the product of the output weight, the nominal current account in US dollars (source: IFS), and the nominal exchange rate of national currency units per US dollar (source: IFS), divided by the CPI. The current account is further regressed on quarter dummies to remove seasonality. For the Non-US Aggregate, the current account is constructed by summing over all countries, except the United States. In doing so, the few missing values for Japan (from 1975-I to 1976-IV) are replaced by zeros.

A.3 Interest Differential

For each country, the interest differential is the difference between the country-specific interest rate and the world interest rate. The country-specific interest rate is the nominal interest rate minus the expected inflation rate. The nominal interest rate is the one-quarter interbank rate (source: IFS). The expected quarterly inflation rate is the one-quarter ahead forecast formed from a univariate ARMA(1,1) process. The world interest rate is the sum of the country-specific interest rates weighted by the country's share of the total output of the 10 countries. The few missing values for Austria (from 1999-I to 2001-II), Finland (from 1975-I to 1977-IV), and France (from 1999-II to 2001-II) are replaced by zeros, and the shares of output are recomputed to exclude these countries. For the Non-US Aggregate, the interest rate is computed similarly to the world interest rate, but excludes the United States.

A.4 Consumption, Investment, and Government Expenditures

For each country, consumption is the output weight times nominal private final consumption expenditures in national currency (source: QNA), deflated by the CPI. Investment is the output weight times nominal gross fixed capital formation in national currency (source: QNA), deflated by the CPI. Government expenditures are the output weight times nominal government final consumption expenditures in national currency (source: QNA), normalized by the CPI. For consumption, investment, and government expenditures, German and Austrian data are regressed on quarter dummies to remove seasonality. For the Non-US Aggregate, consumption, investment, and government expenditures are constructed by summing over all countries, except the United States.

A.5 National Saving

For each country, national saving is the current account plus investment. For the Non-US Aggregate, national saving is constructed by summing over all countries, except the United States.

A.6 Technology

For each country, technology is constructed from the production function (8) using the calibrated capital share $\alpha = 0.36$, and measures of output, capital, and employment. Capital is computed from the capital accumulation equation (5), the calibrated depreciation rate $\delta = 0.025$ and adjustment costs parameter $\phi = 3.75$, the steady state value of capital (for the initial period), and investment. Employment is calculated as the civilian employment index for the baseyear 1995 (source: MEI) times the population in 1985 reported by Summers and Heston (1988) (source: variable 1 in their Table 3). For the Non-US Aggregate, technology is constructed similarly using the Non-US Aggregate measures of output, investment, and employment. The Non-US Aggregate's employment is constructed by summing weighted employment over all countries except the United States, where the weights reflect each country's share of the Non-US Aggregate total population.

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Table 1. Empirical Regularities: Baseline Statistics

	Relative Volatility		Autocorrelation			Correlation		
Country	x	d	y	x	d	(x,y)	(d,y)	(x,d)
Australia	0.55	0.18	0.77	0.67	0.60	-0.30	0.27	-0.26
Austria	1.02	0.18	0.30	0.35	0.70	-0.08	0.21	-0.29
Canada	0.53	0.17	0.90	0.55	0.35	-0.15	0.54	-0.07
Finland	0.60	0.15	0.87	0.23	0.60	-0.00	-0.22	-0.06
France	0.66	0.24	0.85	0.43	0.58	-0.06	0.08	-0.06
Germany	0.43	0.08	0.66	0.53	0.56	-0.48	0.32	-0.23
Italy	0.88	0.21	0.78	0.59	0.60	-0.28	-0.21	0.24
Japan	0.61	0.26	0.63	0.73	0.76	-0.31	-0.03	-0.31
United Kingdom	0.60	0.15	0.78	0.40	0.16	-0.37	0.01	0.09
United States	0.30	0.10	0.90	0.65	0.54	-0.48	0.13	0.09
Non-US Aggregate	0.49	0.14	0.76	0.59	0.52	-0.28	0.04	-0.09
10-Country Average	0.62	0.19	0.74	0.51	0.54	-0.25	0.11	-0.08

Note: Entries under relative volatility, autocorrelation, and correlation refer to the sample standard deviation of the variable relative to the sample standard deviation of y, the sample first-order autocorrelation of the variable, and the sample contemporaneous correlation between variables. The variables are the detrended logarithm of output (y), the detrended ratio of the current account to output (x), and the detrended interest differential (d). The detrending method is the Hodrick-Prescott filter. The interest differential is constructed from ex-ante real interest rates, using a one-quarter ahead predicted inflation rate from an ARMA(1,1) process. The Non-US Aggregate is an aggregate of the 10 countries except the United States. The 10-Country Average is the mean statistic over all 10 countries.

Table 2. Empirical Regularities: Alternative Statistics

Inflation Process	Relative Volatility x	Relative Volatility d	Autocorrelation y	Autocorrelation x	Autocorrelation d	Correlation (x,y)	Correlation (d,y)	Correlation (x,d)
Hodrick-Prescott Filter								
ARMA(1,1)	0.62	0.19	0.74	0.51	0.54	-0.25	0.11	-0.08
AR(1)	0.62	0.22	0.74	0.51	0.27	-0.25	0.09	-0.03
AR(4)	0.62	0.22	0.74	0.51	0.20	-0.25	0.09	-0.08
ARMA(2,2)	0.62	0.21	0.74	0.51	0.15	-0.25	0.09	-0.09
Linear-Quadratic Trend								
ARMA(1,1)	0.44	0.13	0.91	0.73	0.73	-0.29	0.22	-0.17
AR(1)	0.44	0.14	0.91	0.73	0.52	-0.29	0.20	-0.12
AR(4)	0.44	0.14	0.91	0.73	0.47	-0.29	0.17	-0.14
ARMA(2,2)	0.44	0.13	0.91	0.73	0.43	-0.29	0.16	-0.15

Note: Entries refer to statistics averaged over all 10 countries. Entries under relative volatility, autocorrelation, and correlation refer to the sample standard deviation of the variable relative to the sample standard deviation of y, the sample first-order autocorrelation, and the sample contemporaneous correlation. The variables are the detrended logarithm of output (y), the detrended ratio of the current account to output (x), and the detrended interest differential (d). The detrending method is either the Hodrick-Prescott filter or the linear-quadratic trend. The interest differential is constructed from ex-ante real interest rates, using a one-quarter ahead predicted inflation rate from either an ARMA(1,1), an AR(1), an AR(2), or an ARMA(2,2) process. The 10-Country Average is the mean statistic over all 10 countries.

Table 3. Test Results: Baseline Statistics

	Relative Volatility		Autocorrelation			Correlation		
	x	d	y	x	d	(x, y)	(d, y)	(x, d)
Predicted	0.27	0.01	0.87	0.70	0.99	-0.22	0.18	-0.07
United States	0.30	0.10	0.90	0.65	0.54	-0.48	0.13	0.09
	(0.82)	(0.00)	(0.47)	(0.42)	(0.00)	(0.01)	(0.86)	(0.00)
Non-US Aggregate	0.49	0.14	0.76	0.59	0.52	-0.28	0.04	-0.09
	(0.17)	(0.00)	(0.01)	(0.09)	(0.00)	(0.55)	(0.57)	(0.03)
10-Country Average	0.62	0.19	0.74	0.51	0.54	-0.25	0.11	-0.08
	(0.04)	(0.00)	(0.00)	(0.00)	(0.00)	(0.77)	(0.71)	(0.08)

Note: Entries under relative volatility, autocorrelation, and correlation refer to the predicted and sample standard deviations of the variable relative to the predicted and sample standard deviations of y, the predicted and sample first-order autocorrelations, and the predicted and sample contemporaneous correlations. The predicted statistics are constructed from the baseline calibration. The variables are the detrended logarithm of output (y), the detrended ratio of the current account and output (x), and the detrended interest differential (d). Entries in parentheses are the p-values of the test that the difference between the predicted and sample statistics is null.

Table 4. Test Results: Alternative Statistics

	Relative Volatility		Autocorrelation			Correlation		
	x	d	y	x	d	(x, y)	(d, y)	(x, d)
Baseline	0.27	0.01	0.87	0.70	0.99	-0.22	0.18	-0.07
	(0.04)	(0.00)	(0.00)	(0.00)	(0.00)	(0.77)	(0.71)	(0.08)
Risk Aversion								
Low($\sigma = 1$)	0.28	0.01	0.85	0.70	0.99	-0.24	0.28	-0.08
	(0.06)	(0.00)	(0.01)	(0.00)	(0.00)	(0.91)	(0.41)	(0.48)
High($\sigma = 10$)	0.21	0.01	0.92	0.70	0.99	-0.17	-0.12	-0.04
	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.29)	(0.15)	(0.01)
Labor Supply Elasticity								
Low($\frac{1}{\nu-1} = 0.2$)	0.28	0.01	0.84	0.68	0.99	-0.17	0.15	-0.07
	(0.09)	(0.00)	(0.04)	(0.03)	(0.00)	(0.63)	(0.82)	(0.46)
High($\frac{1}{\nu-1} = 2.5$)	0.25	0.01	0.89	0.70	0.99	-0.22	0.15	-0.07
	(0.02)	(0.00)	(0.00)	(0.00)	(0.00)	(0.69)	(0.79)	(0.11)
Investment Adjustment Costs								
Low($\phi = 0$)	11.63	0.06	0.79	-0.10	0.78	0.34	0.79	-0.33
	(0.00)	(0.00)	(0.56)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
High($\phi = 7.5$)	0.13	0.01	0.86	0.66	0.99	-0.05	-0.06	-0.05
	(0.00)	(0.00)	(0.01)	(0.38)	(0.00)	(0.42)	(0.51)	(0.06)
Interest Differential Responsiveness								
Low($\varphi/\beta^2 = 0.001$)	0.23	0.01	0.86	0.73	0.99	-0.16	-0.02	-0.03
	(0.01)	(0.00)	(0.01)	(0.00)	(0.00)	(0.49)	(0.48)	(0.00)
High($\varphi/\beta^2 = 0.01$)	0.32	0.02	0.87	0.65	0.98	-0.24	0.35	-0.10
	(0.12)	(0.00)	(0.00)	(0.03)	(0.00)	(0.93)	(0.12)	(0.24)

Note: Entries under relative volatility, autocorrelation, and correlation refer to the predicted standard deviation of the variable relative to the predicted standard deviation of y, the predicted first-order autocorrelation, and the predicted contemporaneous correlation. The variables are the detrended logarithm of output (y), the detrended ratio of the current account and output (x), and the detrended interest differential (d). The predicted statistics are constructed from the baseline and alternative calibrations. Entries in parentheses are the p-values of the test that the difference between predicted and sample statistics for the 10-Country Average is null.

Table B1. Extensions: Baseline Statistics

	Relative Volatility		Within-Country Correlation			Cross-Country Correlation	
	c	i	(c, y)	(i, y)	$(s/y, i/y)$	(c, c^*)	(y, y^*)
Predicted	0.93	2.23	0.99	0.88	0.70	0.41	0.35
United States	0.88	2.23	0.91	0.92	0.43		
	(0.18)	(0.99)	(0.00)	(0.69)	(0.23)		
Non-US Aggregate	0.85	2.62	0.87	0.79	0.39	0.20	0.38
	(0.01)	(0.30)	(0.00)	(0.27)	(0.16)	(0.42)	(0.88)
10-Country Average	0.90	2.59	0.79	0.74	0.30	0.17	0.29
	(0.39)	(0.34)	(0.00)	(0.12)	(0.06)	(0.37)	(0.83)

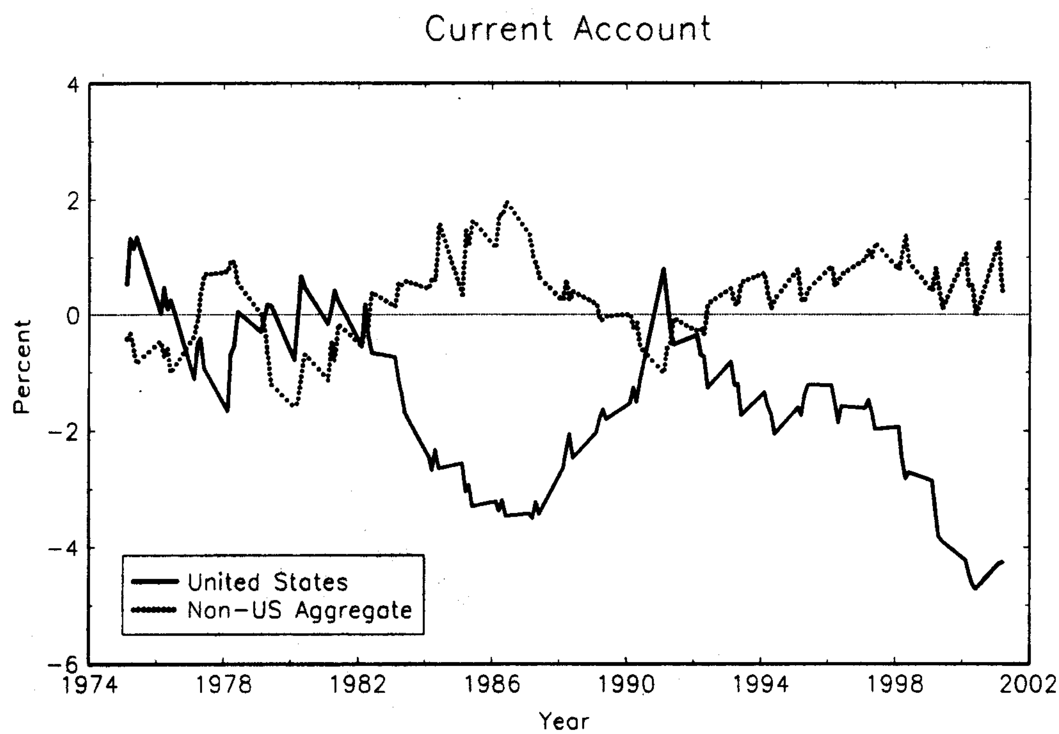
Note: Entries under relative volatility, within-country correlation, and cross-country correlation refer to the predicted and sample standard deviations of the variable relative to the predicted and sample standard deviations of y, the predicted and sample contemporaneous correlations between home variables, and the predicted and sample contemporaneous correlations between international variables. The predicted statistics are constructed from the baseline calibration. The variables are the detrended logarithm of output (y), the detrended logarithm of consumption (c), the detrended logarithm of investment (i), the detrended ratio of national savings to output (s/y), and the detrended ratio of investment to output (i/y). The cross-country statistics refer to United States versus the Non-US Aggregate and to the average of all the bilateral statistics for the 10 countries. Entries in parentheses are the p-values of the test that the difference between the predicted and sample statistics is null.

Table B2. Extensions: Alternative Statistics

	Relative Volatility		Within-Country Correlation			Cross-Country Correlation	
	c	i	(c,y)	(i,y)	$(s/y,i/y)$	(c,c^*)	(y,y^*)
Baseline	0.93	2.23	0.99	0.88	0.70	0.41	0.35
	(0.39)	(0.34)	(0.00)	(0.12)	(0.06)	(0.42)	(0.88)
Risk Aversion							
Low($\sigma = 1$)	0.95	2.22	0.98	0.88	0.67	0.39	0.32
	(0.16)	(0.34)	(0.00)	(0.12)	(0.12)	(0.48)	(0.81)
High($\sigma = 10$)	0.93	2.23	0.99	0.91	0.75	0.47	0.45
	(0.14)	(0.08)	(0.00)	(0.02)	(0.02)	(0.30)	(0.78)
Labor Supply Elasticity							
Low($\frac{1}{\nu-1} = 0.2$)	0.69	2.72	0.93	0.91	0.81	0.51	0.34
	(0.00)	(0.74)	(0.00)	(0.01)	(0.01)	(0.25)	(0.86)
High($\frac{1}{\nu-1} = 2.5$)	1.02	2.01	0.99	0.87	0.63	0.41	0.36
	(0.00)	(0.10)	(0.00)	(0.16)	(0.15)	(0.45)	(0.95)
Investment Adjustment Costs							
Low($\phi = 0$)	0.65	44.83	1.00	-0.29	-0.39	-1.00	-1.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
High($\phi = 7.5$)	0.95	1.80	0.99	0.96	0.83	0.45	0.39
	(0.17)	(0.00)	(0.00)	(0.00)	(0.01)	(0.32)	(0.96)
Interest Differential Responsiveness							
Low($\varphi/\beta^2 = 0.001$)	0.93	2.10	0.98	0.90	0.72	0.45	0.38
	(0.39)	(0.14)	(0.00)	(0.04)	(0.06)	(0.35)	(0.99)
High($\varphi/\beta^2 = 0.01$)	0.93	2.40	0.99	0.85	0.65	0.39	0.33
	(0.41)	(0.65)	(0.00)	(0.26)	(0.10)	(0.48)	(0.83)

Note: Entries under relative volatility, within-country correlation, and cross-country correlation refer to the predicted standard deviation of a variable relative to the predicted standard deviation of y, the predicted contemporaneous correlation between home variables, and the predicted contemporaneous correlation between international variables. The variables are the detrended logarithm of output (y), the detrended logarithm of consumption (c), the detrended logarithm of investment (i), the detrended ratio of savings and output (s/y), and the detrended ratio of investment and output (i/y). Entries in parentheses are the p-values of the test that the difference between predicted and sample statistics is null. The sample statistics are those of the 10-Country Average, except for the cross-country correlation where the sample statistics are those for the United States and the Non-US Aggregate.

Figure 1. Current Account and Interest Differential



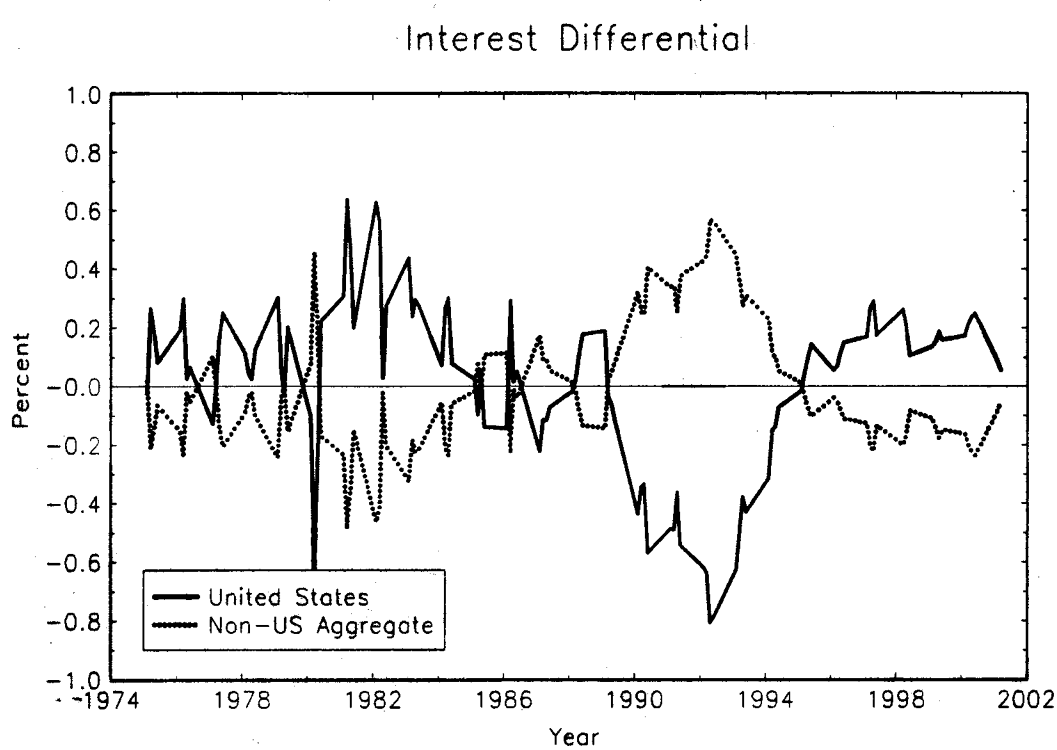


Figure 2. Empirical Regularities: Baseline Cross-Correlation Functions

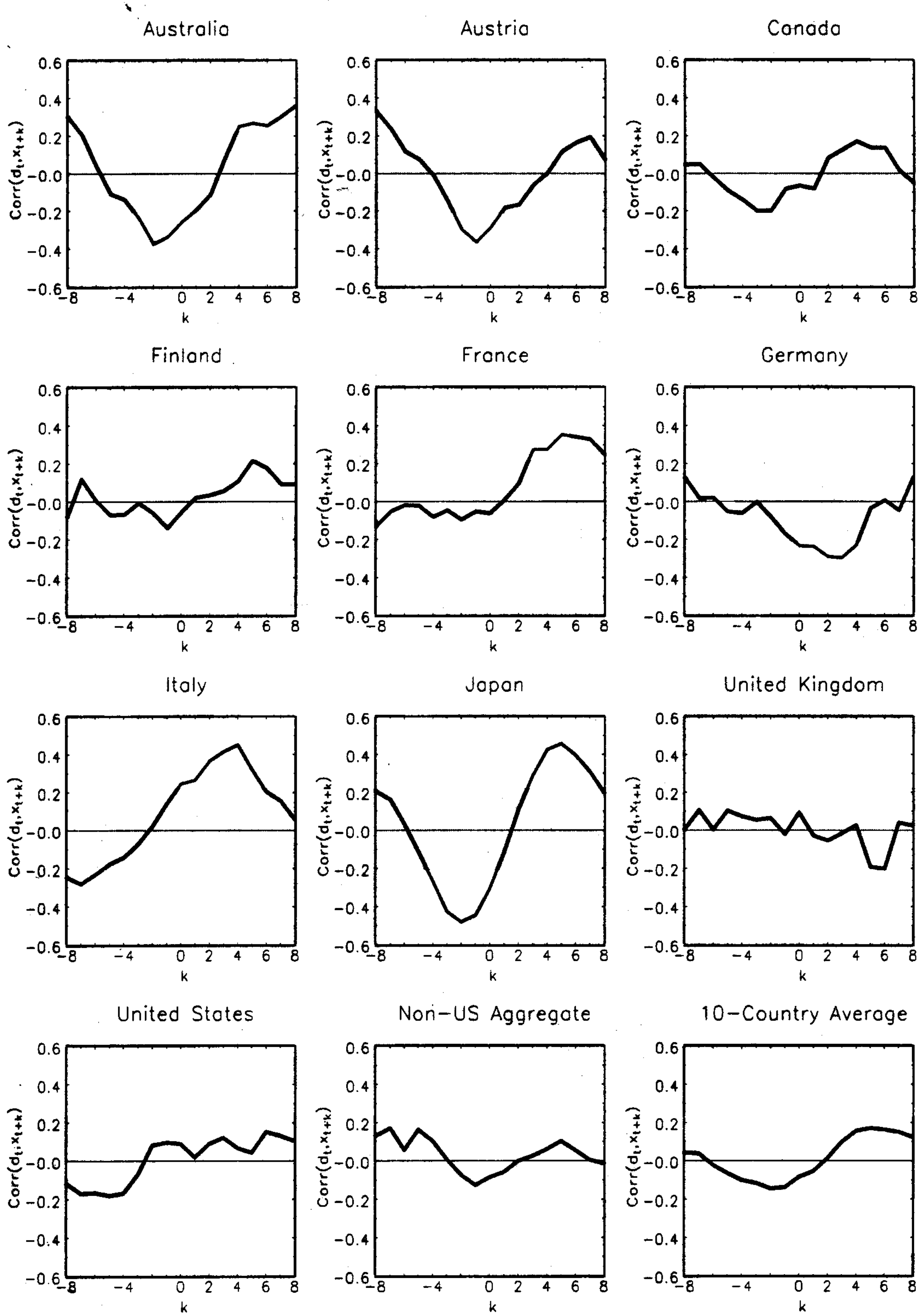


Figure 3. Empirical Regularities: Alternative Cross-Correlation Functions

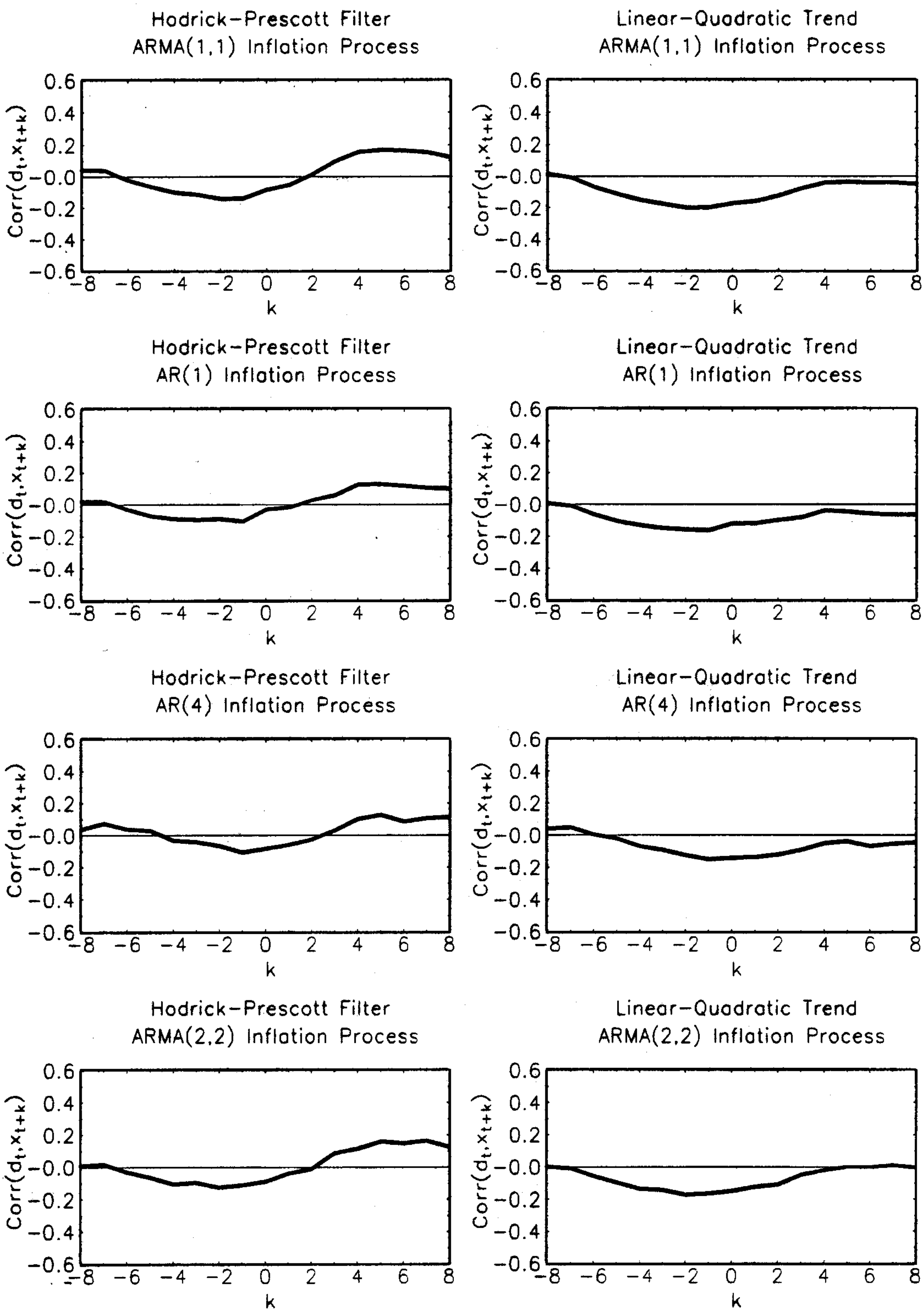


Figure 4. Theoretical Properties: Dynamic Responses

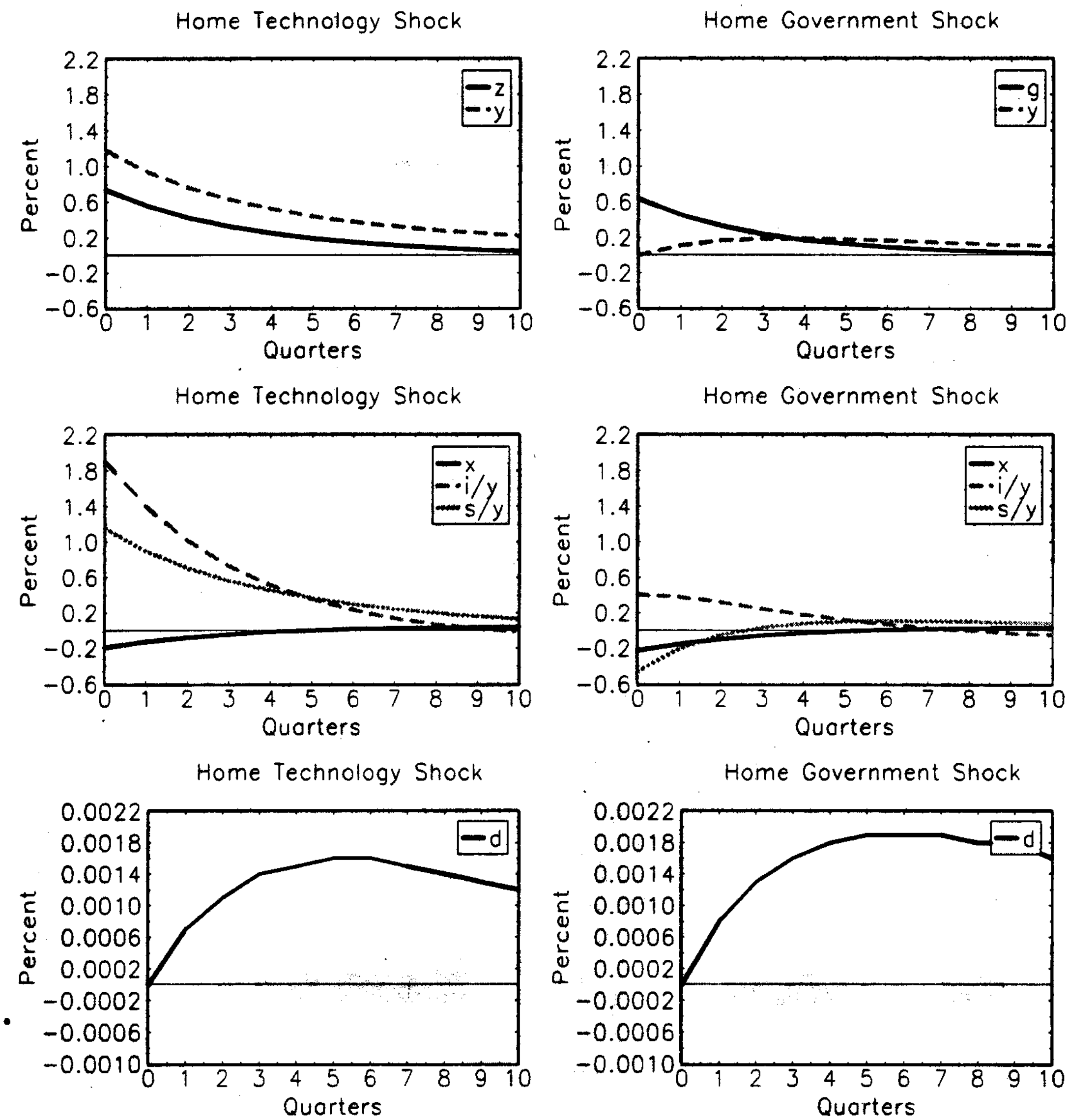


Figure 5. Test Results: Baseline Cross-Correlation Functions

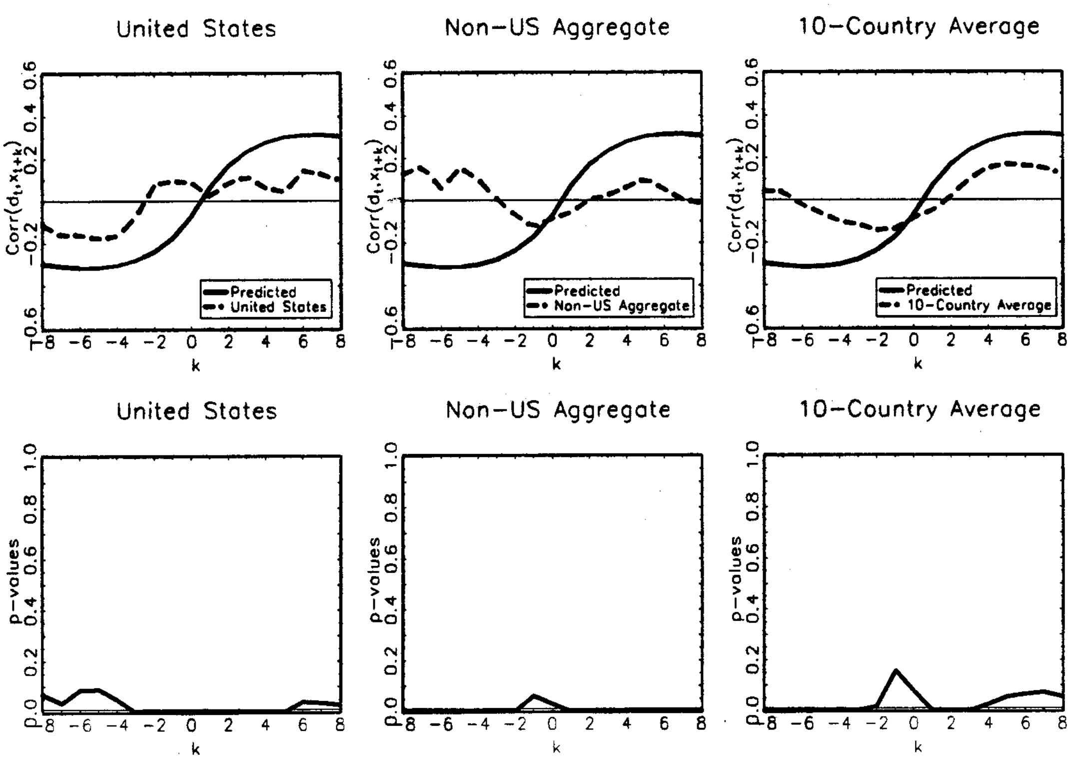


Figure 6. Test Results: Alternative Cross-Correlation Functions