CFR-Working Paper NO. 09-02

Long-Horizon Consumption Risk and the Cross-Section of Returns: New Tests and International Evidence

J. Grammig • A. Schrimpf • M. Schuppli

centre for financial research
Look deeper

Long-Horizon Consumption Risk and the Cross-Section of Returns: New Tests and International Evidence*

Joachim Grammig† Andreas Schrimpf** Michael Schuppli‡

This paper investigates whether measuring consumption risk over long horizons can improve the empirical performance of the Consumption CAPM for size and value premia in international stock markets (US, UK, and Germany). In order to account for commonalities in size and book-to-market sorted portfolios, we also include industry portfolios in our set of test assets. Our results show that, contrary to the findings of Parker and Julliard (2005), the model falls short of providing an accurate description of the cross-section of returns under our modified empirical approach. At the same time, however, measuring consumption risk over longer horizons typically yields lower risk-aversion estimates. Thus, our results suggest that more plausible parameter estimates – as opposed to lower pricing errors – can be regarded as the main achievement of the long-horizon Consumption CAPM.

JEL Classification: G12, G15

Keywords: Consumption-based Asset Pricing, Long-Run Consumption Risk, Value Puzzle, International Stock Markets

---

*The authors are indebted to Martin Bohl, Bernard Dumas, Halit Gonenc, Christian Salm, Stephan Siegel, Tao Wu, two anonymous referees and audiences at the 43rd meeting of the Euro Working Group on Financial Modelling (London), 15th annual meeting of the German Finance Association (Münster), 6th International Meeting of the French Finance Association (Paris), 11th Symposium on Finance, Banking, and Insurance (Karlsruhe), the Tübingen-Konstanz empirical finance seminar as well as seminar participants at University of Münster, University of Tübingen and ZEW Mannheim for useful comments and suggestions. We also thank Kenneth French and Stefan Nagel for making portfolio data available on their websites.

†University of Tübingen, Department of Economics. Research Fellow, Centre for Financial Research (CFR), Cologne.

**Corresponding Author: Centre for European Economic Research (ZEW, Mannheim), P.O. Box 10 34 43, D-68034 Mannheim, Germany, email: schrimpf@zew.de, phone: +49 (0)621-1235-160.

‡University of Münster, Department of Economics.

1 Introduction

Understanding the behavior of asset prices and their relation to macroeconomic risks is one of the most fundamental issues in finance. As is well known, however, the consumption-based asset pricing model (CCAPM) as the traditional workhorse for studying this link has failed to explain a number of stylized facts in finance such as the equity premium (Mehra and Prescott, 1985), asset return volatility (Grossman and Shiller, 1982) or value and size premia (Cochrane, 1996; Lettau and Ludvigson, 2001).[1] In this paper, we provide new evidence as to whether long-run consumption risk helps explain the cross-section of expected returns – especially value and size premia – in international stock markets. Our empirical approach follows Parker and Julliard (2005) in relating asset returns to consumption growth measured over longer horizons within a simple consumption-based framework with CRRA preferences.

We modify Parker and Julliard's empirical approach along two lines. First, we take into account recent criticism about the widespread use of size and book-to-market sorted portfolios in the empirical asset pricing literature (Phalippou, 2007; Lewellen, Nagel, and Shanken, 2007). In order to reduce the adverse effects of strong commonalities in size and book-to-market sorted portfolios, we follow the prescription of Lewellen, Nagel, and Shanken (2007) to include industry portfolios alongside with the conventionally used size and book-to-market portfolios. Second, we provide new international evidence by investigating the model's explanatory power for the cross-section of equity returns in the United Kingdom and Germany.

Our findings shed new light on the relative merits of the long-horizon (LH-) CCAPM when it comes to explaining the cross-section of returns in international stock markets. First, we find that the model's ability to explain cross-sectional variation in returns is clearly limited when accounting for the common factor structure in size and book-to-market sorted portfolios. This result suggests that the good empirical performance on US test assets reported by Parker and Julliard (2005) may be overstated. Tests on size and book-to-market sorted portfolios from the UK and Germany corroborate the US evidence. Second, we find that measuring consumption risk over longer horizons typically yields lower risk-aversion estimates. Thus, our results suggest that more plausible parameter estimates – as opposed to a higher cross-sectional R^2 – can be viewed as the main achievement of the long-horizon consumption-based approach.

[1] The consumption-based asset pricing model has its roots in the original articles by Rubinstein (1976), Lucas (1978), and Breeden (1979).

The long-horizon consumption-based approach is related to a growing body of theoretical literature on long-run consumption risk. Seminal work by Bansal and Yaron (2004) suggests that equilibrium asset returns depend on investors' expectations about both short and long-run changes in consumption growth. Among other things, this result implies that the covariance of returns with contemporaneous consumption growth may understate the risk perceived by investors.[2] Even though the long-run risk framework has important implications for the explanation of risk premia and asset price fluctuations, previous empirical studies surveyed by Bansal (2007) have almost exclusively focussed on the US stock market. By estimating the model on UK and German portfolio returns, our paper explores the universality of the LH-CCAPM approach and, more generally, the role of long-run consumption risk in these markets.

This issue is particularly interesting since the countries considered in our study differ in several institutional respects. Banks play a central role in financial intermediation in Germany, whereas both the US and the UK are known to have a market-based financial system (Allen and Gale, 2001). There are also vast cross-country differences regarding the share of stocks in the net wealth position of households. Stock ownership is much more widespread in Anglo-Saxon countries where between one-third (UK) and half (US) of all households directly or indirectly invest in equity. By contrast, only 17% of German households directly held stocks as of 1998, partly due to higher participation costs (Guiso, Haliassos, and Jappelli, 2003). Among other things, households' stock holdings are crucially affected by a country's pension system. While many Americans and British rely on private mutual or pension funds for retirement saving (implying indirect stock ownership), Germans benefit from an extensive public pay-as-you-go pension system. As highlighted by Hamburg, Hoffmann, and Keller (2008), these factors may have an impact on households' consumption reaction to innovations in returns.[3]

Furthermore, some authors have argued that the well-known US "equity premium puzzle" (i.e. the inability of the consumption-based approach to explain the high level of aggregate stock market returns compared to the T-Bill rate) may to some extent be due to extraordinarily high historical

[2]Research on the long-run implications of the consumption-based asset pricing framework has constituted a rather prominent field in recent literature [e.g. Jagannathan and Wang (2007), Bansal, Dittmar, and Kiku (2007), Hansen, Heaton, and Li (2008) or Rangvid (2008)]. More detailed information on how our paper is related to the extant literature is provided in Section 2.2.

[3]Several authors focus on consumption and investment decisions of stockholders versus nonstockholders. In particular, a recent contribution by Malloy, Moskowitz, and Vissing-Jørgensen (2008) studies the long-run consumption risk of US stockholders. A detailed study using micro-level consumption data for all three countries under consideration is beyond the scope of this paper.

stock returns in the US during the post-war period [See, e.g., the discussions in Cochrane (2007, p.266) or Dimson, Marsh, and Staunton (2008)]. While the British stock market has performed equally well, the post WWII performance of German stocks has been lower. Hence, additional insights may be gained through a cross-country perspective.

The remainder of the text is structured as follows. Section 2 reviews the basic long-horizon consumption risk approach and provides a discussion on the literature most closely related to our paper. Section 3 describes the empirical methods used for estimating and evaluating the different models. Section 4 presents the data and discusses empirical results. Finally, Section 5 concludes.

2 The Long-Horizon Consumption Risk Framework

2.1 Parker and Julliard's Approach

This section briefly reviews the long-horizon consumption-based asset pricing approach put forth by Parker and Julliard (2005). As a starting point, consider the traditional two-period consumption-based model. As is well known, the model implies Euler equations of the following form

$$\mathbb{E}_t \left[\delta \frac{u'(C_{t+1})}{u'(C_t)} \; R^e_{t+1} \right] = 0, \tag{1}$$

where $u(.)$ denotes current-period utility, δ the subjective time discount factor, and R^e_{t+1} the excess return on a risky asset. Empirical tests of consumption-based models are typically based on moment conditions implied by variants of Equation (1). Parker and Julliard (2005) use the model's first order condition for the risk-free rate between points in time t+1 and t+1+S

$$u'(C_{t+1}) = \delta \mathbb{E}_{t+1}[R^f_{t+1,t+1+S} \; u'(C_{t+1+S})] \tag{2}$$

to substitute out period t+1 marginal utility in the above Euler equation. Assuming power utility and $\delta \approx 1$, Equation (1) can thus be rewritten as

$$\mathbb{E}_t \left[m^S_{t+1} \; R^e_{t+1} \right] = 0, \tag{3}$$

where $m^S_{t+1} = R^f_{t+1,t+1+S} \left(\frac{C_{t+1+S}}{C_t} \right)^{-\gamma}$ is the stochastic discount factor (SDF) and S denotes the horizon at which consumption growth is measured. As shown by Malloy, Moskowitz, and Vissing-

Jørgensen (2008), a very similar stochastic discount factor can be derived within the Epstein and Zin (1989) recursive utility framework of Hansen, Heaton, and Li (2008). Taking unconditional expectations and rearranging yields an expression for the expected excess return

$$\mathbb{E}[R^e_{i,t+1}] = -\frac{\text{Cov}\left[m^S_{t+1}, R^e_{i,t+1}\right]}{\mathbb{E}[m^S_{t+1}]}, \tag{4}$$

which is similar to the case of the standard model except that the excess return now depends on its covariance with marginal utility growth over a longer time-horizon. In other words, investors demand a higher risk premium on assets whose return is more positively correlated with consumption growth over a long horizon. Parker and Julliard (2005) refer to the covariance of an asset's excess return with the modified SDF as "ultimate consumption risk".

The model's asset pricing implications can be tested either by directly estimating the nonlinear specification given by Equation (3), or by using the representation given by (4). Alternatively, the model can be estimated in its linearized form. Applying a first-order log-linear approximation of the SDF in the spirit of Lettau and Ludvigson (2001) yields

$$m^S_{t+1} = R^f_{t+1,t+1+S} - \gamma_S R^f_{t+1,t+1+S} \Delta c_{t+1+S}, \tag{5}$$

where $\Delta c_{t+1+S} = \ln\left(C_{t+1+S}/C_t\right)$ represents log consumption growth from t to t+1+S. Hence, the model using the linearized SDF in (5) can be interpreted as a linear two-factor model. Furthermore, assuming the risk-free rate to be constant between t and t+1+S, the linear approximation reduces to a single factor model where the pricing kernel is a function of log consumption growth over long horizons.

2.2 Related Literature and Further Motivation

An important aspect of the long-horizon CCAPM is that, in addition to retaining the parsimony of the power utility specification, it does not impair the basic assumptions of the consumption-based asset pricing framework. Yet, at the same time, the approach is consistent with various arguments why the covariance of an asset's return with contemporaneous consumption growth may understate its risk due to slow consumption adjustment. First, macroeconomic data on household consumption expenditure is difficult to obtain and survey-based quarterly statistics may not provide an accurate measure of consumption adjustment. Using long-horizon consumption growth in empirical tests of the consumption-based framework may help to overcome the effect of measurement error in quarterly data.

Second, a wide range of factors not considered in the basic model, such as different sources of income, housing and durable goods consumption, may enter the utility function. In this case, the utility function is non-separable in that marginal utility with respect to one argument will always depend on the value of the other arguments. In addition, some of the consumption goods entering the utility function may involve a commitment (Chetty and Szeidl, 2005). Obviously, the adjustment of durable goods and housing consumption requires households to incur considerable transaction costs. Moreover, many services such as telecommunications are typically subject to long-term contracts. These real-world features imply that aggregate consumption adjustment may be slow.

Third, due to market imperfections such as costs of gathering and processing information, agents' short-term behavior may deviate from utility-maximizing consumption smoothing. In the presence of such frictions, investors may not optimally adjust consumption or rebalance their portfolio if utility losses from non-optimal behavior are small in magnitude (Cochrane, 1989). Such "near-rational" behavior appears plausible especially in the short-run. Again, from an empirical point of view, the reaction of consumption to changes in aggregate wealth will probably not be reflected in quarterly observations so that long-horizon consumption growth provides a more exact measure of perceived consumption risk.

Furthermore, the CCAPM of Parker and Julliard (2005) is closely related to a growing body of literature suggesting that investors require a compensation for bearing long-run consumption risk in asset returns. Pioneering theoretical work by Bansal and Yaron (2004) models consumption and dividend growth as containing a small persistent predictable component. Therefore, current shocks to expected growth will affect expectations about consumption growth in both the short and long run. From a theoretical point of view, the proposed consumption and dividend process can be motivated by explicitly modeling a production economy as in Kaltenbrunner and Lochstoer (2007).[4] Bansal and Yaron (2004) show that in an economy with Epstein-Zin investor preferences, this additional source of risk helps to explain longstanding issues in finance such as the equity

[4] The existence of a persistent component in consumption and dividends is empirically confirmed by Bansal, Kiku, and Yaron (2007).

premium, low risk-free rates, high stock market volatility, and the predictive power of price-dividend ratios for long-horizon stock returns. In addition, the long-run risk framework has strong implications for the cross-section of expected asset returns. If the representative agent is concerned about both short and long-run consumption risk, she will require higher risk premia on assets that are correlated with long-run consumption growth. Modeling dividend and consumption growth as a vector autoregressive system, Bansal, Dittmar, and Lundblad (2005) determine the exposure of dividends to long-run consumption risk. They show that this exposure helps explain a large fraction of cross-sectional variation in returns across book-to-market, size and momentum portfolios. Other recent papers documenting the relevance of long-run consumption risk for determining equilibrium asset returns include Bansal, Dittmar, and Kiku (2007), Hansen, Heaton, and Li (2008), Malloy, Moskowitz, and Vissing-Jørgensen (2008), and Colacito and Croce (2008).

In sum, a large body of evidence for the US suggests that consumption growth measured over longer horizons may be an important risk factor explaining cross-sectional variation in returns. Indeed, Parker and Julliard (2005) show that the cross-sectional R^2 obtained when estimating the model on 25 US book-to-market and size portfolios increases with the horizon at which consumption growth is measured. Their non-linear specification explains up to 44% of the cross-sectional variation in average excess returns for a horizon of 11 quarters. In this respect, the model's performance is similar to the conditional CCAPM of Lettau and Ludvigson (2001) and the Fama and French (1993) three factor model. This finding suggests that long-run risk may help resolve the value premium puzzle.

Another prominent drawback of the canonical CCAPM with CRRA utility is that, given the observed risk premia, estimated coefficients of relative risk aversion are usually implausibly high (Hansen and Singleton, 1983). This aspect is at the center of recent work by Rangvid (2008), who tests an international LH-CCAPM using world-consumption growth as a risk factor on excess aggregate stock market returns from 16 developed capital markets. The author shows that risk aversion estimates for an internationally diversified investor decrease substantially to more plausible values if long-run consumption risk is taken into account. However, the beta-pricing version of the model has trouble explaining the cross-section of international stock index returns.

It is important to note that his empirical approach is based on the assumptions of an international representative investor, integrated financial markets, and purchasing power parity. This paper, in contrast, analyzes the ability of the LH-CCAPM to explain the individual cross-section of stock returns in three major stock markets. Besides requiring weaker assumptions, looking at only three countries enables us to use detailed consumption data that distinguish expenditure on nondurable goods and services from durable goods (rather than having to rely on measures of total consumption). Moreover, it allows us to pin down pricing errors for individual stock portfolios formed on characteristics such as size and book-to-market equity ratios, which are of particular interest in the empirical finance literature.

3 Empirical Methodology

In this section we outline our empirical approach for exploring the performance of the long-horizon consumption-based asset pricing framework. Moment restrictions necessary to estimate any model for the stochastic discount factor by the Generalized Method of Moments (GMM) can be derived from Euler equations similar to Equation (3). Nonetheless, we opt for the slightly different GMM estimation strategy employed by Parker and Julliard (2005), using moment conditions based on the expression for expected excess returns in Equation (4). There are three reasons for doing this: First, closely following Parker and Julliard's approach renders our empirical results comparable to theirs. Second, as we will illustrate below, their approach allows us to empirically disentangle a model's ability to explain the equity premium from its cross-sectional explanatory power. Third, this approach provides an intuitive interpretation of our GMM estimation results: Using the moment restrictions in Equation (4) implies that the difference between empirical and theoretical moments can be interpreted as errors in expected returns, which in turn are proportional to pricing errors. These pricing errors will be directly comparable across models. More specifically, consider the vector of unconditional moment restrictions

$$\mathbb{E}[h(\Theta_{t+1}, \mu_S, \gamma_S, \alpha_S)] = 0, \tag{6}$$

where Θ_{t+1} represents the data (the vector of N test asset excess returns and consumption growth), whereas the model parameters are given as μ_S (mean of the stochastic discount factor m^S_{t+1}) and γ_S (risk aversion parameter of the representative agent). For the nonlinear model introduced in Section 2.1, the (N+1) $\times$ 1 empirical moment function $h(.)$ is given by

$$h(\Theta_{t+1}, \mu_S, \gamma_S, \alpha_S) = \begin{bmatrix} R^e_{t+1} - \alpha_S \iota_N + \frac{(m^S_{t+1} - \mu_S) R^e_{t+1}}{\mu_S} \\ m^S_{t+1} - \mu_S \end{bmatrix} \tag{7}$$

where R^e_{t+1} denotes the vector of N test asset excess returns, ι_N is an N-dimensional vector of ones and the last moment condition is intended to identify the mean of the SDF. Following Parker and Julliard (2005) and Yogo (2006), we include an intercept parameter α_S in the moment function in Equation (7). When estimating a candidate model, this approach allows us to disentangle its predictive power for the overall level of stock returns compared to the risk-free rate (equity premium) from its cross-sectional fit across test assets. Since the point estimate for α_S will be expressed in units of expected returns, the parameter indicates the magnitude of a model's implied "equity premium puzzle". If the parameter is significant for a candidate model, this implies that this model has trouble explaining the excess returns of stocks over the risk-free rate.

We modify the estimation approach by Parker and Julliard (2005) in one important dimension. In a recent contribution, Lewellen, Nagel, and Shanken (2007) highlight statistical problems associated with the common use of size and book-to-market sorted portfolios in the empirical asset pricing literature. In particular, given the strong factor structure of these portfolios, Lewellen, Nagel, and Shanken (2007) point out that any model incorporating factors that are correlated with SMB and HML potentially produces a high cross-sectional R^2 when tested on these test assets. In order to avoid these problems, we expand the set of test assets to include industry portfolios along with the commonly used size and book-to-market sorted portfolios. This implies that our modified empirical approach provides a clearly tougher challenge for the candidate asset pricing models compared to Parker and Julliard (2005).

In addition to testing the nonlinear long-horizon consumption-based model, we also compare the empirical performance of the linearized LH-CCAPM in Equation (5) to traditional factor models such as the CAPM and the Fama and French (1993) model. The moment function for the three candidate factor models differs slightly from the nonlinear model, reflecting the linear approximation of the stochastic discount factor. Let f_{t+1} denote the vector of k factors, μ the vector of estimated factor means, and b the vector of coefficients measuring the marginal effect of the respective factors on the SDF. The (N+k) $\times$ 1 moment function can then be written as

$$h(\Theta_{t+1}, \mu, b, \alpha) = \begin{bmatrix} R^e_{t+1} - \alpha_S \iota_N + R^e_{t+1}(f_{t+1} - \mu)'b \\ f_{t+1} - \mu \end{bmatrix}. \tag{8}$$

This moment function satisfies N+k unconditional moment restrictions given by

$$\mathbb{E}[h(\Theta_{t+1}, \mu, b, \alpha)] = 0, \tag{9}$$

which can be used to estimate the parameters of the model by GMM. In this context, it is important to note that identification of the parameters of the linear model requires some normalization. Using demeaned factors in the moment function in Equation (8) achieves this, but it also implies that we have to correct standard errors for the fact that factor means are estimated along the way. Therefore we use the augmented moment function in Equation (8), which imposes additional restrictions on the deviation of factors from their estimated means.[5]

In general, the GMM framework allows for various choices of the matrix determining the weights of individual moments in the objective function. As discussed in detail in Cochrane (2005, Ch. 11), the particular choice of weighting matrix affects both statistical properties and economic interpretation of the estimates: Even though second or higher stage GMM estimates based on the optimal weighting matrix of Hansen (1982) are efficient, they are difficult to interpret economically as they imply pricing some random combination of reweighted portfolios. Instead, relying on first stage estimates with equal weights compromises efficiency while maintaining the economic interpretation of empirical tests. Therefore, our discussion of empirical results in Section 4 centers on first stage GMM estimates.

As is customary in the literature on the evaluation of asset pricing models and anomalies, we also provide the cross-sectional R^2 as a measure of how well the particular model captures the variation of average returns across portfolios.[6] In order to take account of the methodological critique of the cross-sectional R^2 by Lewellen, Nagel, and Shanken (2007), we robustify our empirical approach by adding industry portfolios, and – most importantly – take the economic meaning of the point

[5]For a detailed discussion of this issue see Cochrane (2005, Ch. 13) and Yogo (2006, Appendix C).

[6]The computation of the cross-sectional R^2 in the GMM framework follows the extant literature (e.g. Lettau and Ludvigson 2001; Parker and Julliard 2005): $R^2 = 1 - \mathrm{Var}_c(\bar{R}^e_i - \hat{R}^e_i)/\mathrm{Var}_c(\bar{R}^e_i)$, where Var_c denotes a cross-sectional variance, $\bar{R}^e_i$ is the time series average of the excess return on asset i, and $\hat{R}^e_i$ is the fitted mean excess return for asset i implied by the model.

estimates seriously when evaluating the candidate asset pricing models.

In addition, we also report results from the "test of overidentifying restrictions" based on iterated GMM estimation as a test of overall model fit. An alternative advocated by Hansen and Jagannathan (1997) is to use the inverse of the second moment matrix of returns as a first stage weighting matrix. This approach allows us to compute the corresponding Hansen-Jagannathan (HJ) distance, which serves as an additional metric for model comparison.[7]

4 Empirical Analysis

4.1 Data

This section provides a detailed overview of the data used in this paper. Data on personal consumption expenditure are available from national institutions in the respective country: the US Bureau of Economic Analysis (BEA), the UK Office for National Statistics (ONS), and the Federal Statistical Office (Destatis) in Germany. As is customary in the literature on consumption-based asset pricing, we use a measure of household's consumption of non-durable goods and services obtained from the official statistics.[8] We divide by quarterly population figures to express consumption in per capita terms. Finally, all consumption time-series are deflated by the respective consumer price index.

While data on different consumption categories (nondurables, durables and services) are readily available at the quarterly frequency for both the US and the UK, this is not the case for Germany. We therefore use detailed annual data on personal consumption expenditures for different items to construct the share of nondurables and services in total consumption per annum. In order to estimate quarterly per capita expenditure on nondurables and services, we assign the same share to all quarterly total expenditure observations within a given year. Another important aspect is the effect of Germany's reunification on consumption data. We correct for the negative outlier in the one-period (per capita) consumption growth rate due to the reunification using interpolation as in Stock and Watson (2003). Longer-horizon growth rates are then based on the corrected

[7] For computational details and the simulations for the model test based on the HJ-distance, the reader is referred to the Appendix in Parker and Julliard (2005).

[8] Additional estimations (not shown) confirm that our main conclusions are largely unaffected if total consumption expenditure is used instead of nondurables and services consumption.

series. Our consumption dataset covers the periods 1947:Q2 - 2004:Q3 for the US, 1965:Q2 - 2003:Q4 for the UK, and 1974:Q2 - 2003:Q4 for Germany.

Our choice of test assets is mainly guided by two considerations. First, our aim is to analyze the ability of the long-horizon CCAPM to price the cross-section of stock returns in major financial markets outside the United States. Second, following the suggestions of Lewellen, Nagel, and Shanken (2007), we use a broad set of test assets including portfolios sorted on both book-to-market and size as well as industry. This choice is intended to avoid problems arising from strong commonalities in size and book-to-market sorted portfolios.

As is standard in the empirical finance literature, our set of test assets contains 25 US value and size portfolios introduced by Fama and French (1993). Similar portfolios capturing both size and value premia are constructed by Dimson, Nagel, and Quigley (2003) for the United Kingdom[9] and by Schrimpf, Schröder, and Stehle (2007) for Germany. The total number of listed stocks in the UK and Germany is much smaller than in the US. Therefore, in both cases, stocks are sorted into only 16 portfolios in order to avoid potential biases in portfolio returns. For comparisons with traditional asset pricing models such as the CAPM and the Fama and French (1993) three factor model, we obtain data on market returns, the excess return of small over big market capitalization firms (SMB), and the excess return of companies with high versus low book-to-market equity ratios (HML) from the same sources.

Returns on ten US industry portfolios sorted according to SIC codes are available from Kenneth French's website.[10] In case of the UK, we use seven industry portfolios obtained from Datastream which are available for the longest possible sample period matching the one of the other UK test assets. Our industry portfolios for the German stock market are obtained from the German Finance Database (Deutsche Finanzdatenbank) maintained at the University of Karlsruhe. The sample periods for test asset returns cover 1947:Q2 - 2001:Q4 for the US, 1965:Q2 - 2001:Q1 for the UK, and 1974:Q2 - 2001:Q1 for Germany.[11] We compute excess returns on all portfolios using a country-specific proxy for the risk-free rate: For the US and the UK, we use the 3-month T-bill rate. In the case of Germany, a 3-month money market rate from the time series database of

[9] Returns on the 16 portfolios as well as Market, HML and SMB factors can be downloaded from Stefan Nagel's webpage: `http://faculty-gsb.stanford.edu/nagel`

[10] `http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/`

[11] Notice that the overall sample period, however, is longer due to the long-horizon consumption growth (up to S) aligned to the returns: US (2004:Q3), UK (2003:Q4), GER (2003:Q4).

Deutsche Bundesbank is used. Finally, we compute real returns on all risky and risk-free assets using the respective national consumer price index (CPI). We use these real returns in all of our empirical tests.[12]

4.2 Empirical Results: Non-Linear Model

As pointed out in Section 3, we estimate the nonlinear LH-CCAPM for each of the three markets separately using the Generalized Method of Moments (GMM). Our discussion of empirical results focuses on three aspects: a candidate model's ability to explain the equity premium ($\hat{\alpha}$), the plausibility of the estimated risk-aversion parameter ($\hat{\gamma}$), and its cross-sectional explanatory power as reflected by the cross-sectional R^2 and pricing error plots. In addition, we report results from J-tests based on iterated GMM estimates, the root mean squared error (RMSE) from first stage GMM estimation, and the HJ-distance metric proposed by Hansen and Jagannathan (1997).

Our results for the US, reported in Table 1, complement the evidence in Table 1 of Parker and Julliard (2005) and provide a reassessment of their findings.[13] It is important to keep in mind that we use an expanded set of test assets by adding 10 industry portfolios to the 25 Fama-French portfolios. As evinced by Table 1, the risk-aversion estimate for the standard CCAPM (S=0) is rather large, mirroring previous results in the literature. It is worth noting, however, that the estimated RRA coefficient typically decreases to substantially lower values as we move from short to long-term consumption risk. As is common in the empirical literature on consumption-based asset pricing models, standard errors are rather large, but it is worth noting that the precision of the estimates generally tends to increase with the horizon.[14] As the significant $\hat{\alpha}$ estimates show, a major limitation of the LH-CCAPM is the failure to explain the equity premium. In contrast to results reported by Parker and Julliard (2005), its magnitude hardly declines as the consumption growth horizon increases. Thus, the model leaves unexplained a substantial fraction of the excess return of stocks over the risk-free rate. The J-test rejects all short and long-horizon

[12] CPI data for the US, the UK and Germany are available from the BEA, the IMF International Financial Statistics and the OECD Economic Outlook, respectively.

[13] In order to render our results comparable across countries, we limit the horizon at which long-run consumption risk is measured to 11 quarters.

[14] The overlap of observations of long-run consumption growth induces serial correlation, which must be accounted for when conducting inference in case of the LH-CCAPM. Our estimate of the covariance matrix of GMM estimates is computed by the procedure of Newey and West (1987) with S+1 lags.

specifications of the CCAPM.[15] Likewise, the consumption-based model is rejected by the test based on the HJ-distance for any horizon, but p-values are increasing as we extend the horizon. There is also slight evidence that the HJ-distance is lower in absolute terms for S=11 compared to the standard CCAPM (S=0).

[Insert Table 1 about here]

Most importantly, however, the results presented in Table 1 suggest that the exclusive use of size and book-to-market portfolios [as in Parker and Julliard (2005)] overstates the empirical performance of the long-horizon CCAPM. If we include industry portfolios in our set of test assets, as advocated by Lewellen, Nagel, and Shanken (2007), we only find moderate improvements of the consumption-based asset pricing approach as the horizon of long-horizon consumption risk increases. The estimated R^2 reaches a maximum of only 20% at a horizon of eleven quarters, which is half the value reported by Parker and Julliard (2005) for the same horizon. Therefore, the main empirical success of the the LH-CCAPM seems to lie in more plausible estimates of the coefficient of relative risk-aversion.

[Insert Table 2 about here]

Next, we provide estimation results on the performance of the LH-CCAPM for the cross-section of returns in the UK and Germany, where previous literature on cross-sectional tests of consumption-based asset pricing models is rather scarce.[16] Estimation results for the UK reported in Table 2 largely confirm our findings for the US. Even though the estimated coefficient of determination peaks at consumption growth horizons of 3 and 7 quarters, the overall explanatory power of the LH-CCAPM remains comparably low. This is also evident from pricing errors summarized by the RMSE. In analogy to the R^2 measure, mispricing is least pronounced for medium horizons

[15] This is a common finding in the empirical asset pricing literature: Even the best performing models such as the Fama-French three factor model are often rejected by formal statistical tests [e.g. Lettau and Ludvigson (2001)].

[16] An exception is the work of Gao and Huang (2004), who use UK value and size portfolios, whereas other papers such as Hyde and Sherif (2005a,b) for the UK and Lund and Engsted (1996) for Germany estimate consumption-based models separately for each industry sector or market index.

of 3 and 7 quarters.[17] Moreover, the model cannot explain the overall level of UK stock returns. Nevertheless, the effect of long-horizon risk on risk-aversion estimates is again remarkable. If we measure consumption growth over a time period of at least 5 quarters following the return, the estimated risk-aversion coefficient declines to values around five.

Table 3 summarizes the evidence on the empirical content of the long-horizon CCAPM framework for the German stock market. The results for the LH-CCAPM in Germany are quite in line with those for the US stock market discussed above. As evinced by the Table, we find that the plausibility of parameter estimates varies with the consumption growth horizon. Risk-aversion estimates tend to decline to more plausible levels as we increase the time period over which consumption growth is measured, even though this decrease is not monotonous. At the same time, the estimated cross-sectional R^2 also varies with the horizon and reaches a maximum of 22% for S=11. Comparing various CCAPM specifications in terms of average pricing errors (RMSE) for German stock portfolios leads to the same conclusion.

[Insert Table 3 about here]

Interestingly, even the canonical consumption-based model does not imply an "equity premium puzzle" for Germany. What is more, the relevant estimate ($\hat{\alpha}$) is further reduced if long-horizon consumption risk is taken into account. Overall, the results for the UK and the German stock markets corroborate our earlier conclusion that, even though the ability of the LH-CCAPM to account for size and value premia is rather limited, the modified model helps to obtain more plausible risk-aversion parameter estimates.

4.3 Empirical Results: Linearized Model

In order to facilitate comparison with traditional factor models for the stochastic discount factor, we also estimate the linearized version of the LH-CCAPM. Tables 4, 5, and 6 summarize estimation results assuming a constant risk-free rate, which implies a one-factor model where long-horizon consumption growth serves as the single risk factor. In general, estimates are in accordance with those obtained for the nonlinear model.

[17] We discuss pricing errors on individual portfolios in more detail below.

As discussed in the previous subsection, when required to price a broader cross-section of assets, the long-horizon risk CCAPM apparently has trouble explaining US excess returns (Table 4). Nevertheless, our results confirm those of Parker and Julliard (2005) in two other regards. First, the cross-sectional R^2 increases considerably for longer horizons. Second, GMM coefficient estimates suggest that the effect of consumption growth on the representative investor's stochastic discount factor is estimated more precisely if consumption risk is measured over longer time periods. Moreover, the estimate of the risk-aversion coefficient declines to more economically plausible values as the horizon S increases.

[Insert Table 4 about here]

[Insert Table 5 about here]

The explanatory power of the linearized LH-CCAPM for the cross-section of returns seems clearly weaker when tested on UK stock portfolios. Similar to estimation results for the nonlinear specification, the coefficient of determination is highest for horizons of 3 (12%) and 7 (9%) quarters. In addition, point estimates $\hat{b}$ suggest that the SDF is not systematically related to consumption risk, irrespective of the chosen horizon. Although implied risk-aversion estimates have high standard errors, they exhibit a considerable decline as we extend the horizon over which consumption risk is measured.

Results for the linearized version of the LH-CCAPM for the German stock market are provided in Table 6. As was the case for the nonlinear specification, the model has no problem explaining the the overall level of stock returns. Taking long-horizon risk into account improves the performance of the CCAPM in other respects. The empirical fit as measured by R^2 and RMSE is best for a consumption risk horizon of 11 quarters. Moreover, implied risk aversion appears to decrease with horizon (albeit in a non-monotonous fashion). If consumption risk is measured over 11 quarters, the coefficient of relative risk aversion is estimated at a rather low value of 10 which is half the point estimate obtained for the conventional CCAPM. Moreover, the significance of $\hat{b}$, the parameter measuring the effect of consumption growth on the SDF, is far higher for S=11 than for the canonical CCAPM.

All together, inference for the linearized LH-CCAPM suggests that long-horizon consumption risk helps improve the empirical performance of the consumption-based model in certain ways. Even though detailed empirical results differ across countries, some common patterns emerge. Most notably, measuring consumption risk over several quarters following the return helps to obtain much more plausible estimates of the representative investor's risk-aversion coefficient. This result is in accordance with recent evidence presented by Rangvid (2008).

[Insert Table 6 about here]

4.4 Comparison to Traditional Linear Factor Models and Across Sets of Test Assets

Empirical results for the linearized CCAPM can be directly compared to those for the Fama and French (1993) three factor model and the traditional CAPM, which are summarized in Table 7.

Estimates for 35 US portfolios in Panel A are in line with previous evidence in the literature [e.g. Fama and French (1993) or Lettau and Ludvigson (2001)]: While the Fama-French three factor model explains more than 50% of cross-sectional variation in returns, the standard CAPM performs extremely poorly. Accordingly, as shown in Figure 1, portfolio excess returns predicted by the CAPM appear to be almost unrelated to realized average excess returns. In contrast, fitted excess returns for the Fama-French model and, to a lesser extent, the LH-CCAPM line up more closely to the 45° line. At the same time, estimation results in Table 7 also indicate that, with the exception of HML, none of the proposed Fama-French factors seem to significantly affect the SDF of the representative US investor. A closer examination of the relative magnitude of mispricing across size and value portfolios in Figure 2 reveals that these are remarkably similar for both consumption-based models. In other words, accounting for long-run risk does not help to better explain returns on portfolios that are already poorly priced by the canonical model.

As illustrated in Figure 2, this conclusion also holds for the UK. The empirical fit of the canonical and the modified CCAPM are relatively similar both in terms of pricing errors on individual portfolios as well as regarding the magnitude of average mispricing (average distance to the 45° degree line). This result is consistent with parameter estimates reported in Tables 5 and 7. By contrast, the high explanatory power of the Fama and French (1993) model typically found for the US is even higher for the cross-section of UK stock returns. First stage GMM estimates reveal that the model explains as much as 71% of cross-sectional variation in returns, compared to only 6% for the CAPM and 9% for the canonical CCAPM (S=0). However, coefficients measuring the marginal impact of the respective financial risk factors on the SDF reported in Table 7 are not significantly different from zero.

[Insert Table 7 about here]

[Insert Figure 1 about here]

[Insert Figure 2 about here]

In the case of Germany (Panel C), the cross-sectional R^2 obtained for the long-run risk model - up to about 20% at 11 quarters - is clearly qualified by the high explanatory power of the ad hoc factor model of Fama and French (1993) (70%) and the CAPM (52%). Actually, the CAPM performs surprisingly well when tested on a cross-section of 28 industry, value and size portfolios, as reflected by significant $\hat{b}$ estimates and the smallest HJ-distance of all candidate models.[18] Nevertheless, the three factor model performs even better in that it provides an explanation for the overall level of returns relative to the risk-free rate and is not rejected by the test of overidentifying restrictions at the 5% significance level. Comparing all three models in terms of their explanatory power for German stock returns, the long-run consumption risk model does not provide any advantages over the two traditional linear models based on financial factors. Pricing

[18]This result is remarkable given the poor performance of the standard CAPM documented in the paper by Schrimpf, Schröder, and Stehle (2007) which is based on an evaluation of the model on monthly data.

error plots in Figure 3 confirm this conclusion as the magnitude of pricing errors is considerably lower for the three-factor model of Fama and French (1993). Interestingly, both short and long-horizon CCAPM generate the highest pricing errors on exactly the same portfolios, which are German small growth stocks (S1B1) and transportation companies (I10).

Summing up, the empirical success of long-run consumption risk compared to the canonical CCAPM in terms of cross-sectional explanatory power is qualified by the astonishingly good performance of the three-factor model.[19] At the same time, our results for the UK and the US confirm the bad performance of the CAPM typically found in empirical model comparisons. Surprisingly, we find that this model explains as much as 52% of cross-sectional variation in returns across German portfolios. In any case, measuring risk in stock returns as their covariance with long-run consumption growth leads to some improvements over the canonical CCAPM in terms of overall empirical fit. In particular, while moving from short (Canonical CCAPM) to long-term consumption risk (LH-CCAPM) may help to reduce pricing errors on *average*, the relative mispricing across *individual assets* (especially value and size portfolios) is strikingly similar for both consumption-based models. Overall, value and size premia still remain a major challenge for the LH-CCAPM.[20]

[Insert Figure 3 about here]

Finally, we investigate to what extent our conclusions regarding the relative cross-sectional fit of the candidate consumption-based models are driven by the inclusion of industry portfolios in our set of test assets. For each country, we estimate the short- and long-horizon CCAPM on value and size portfolios only. Figure 4 gives a visual summary of the empirical results. The two upper plots reproduce the remarkable increase in explanatory power for the long-horizon approach vis-á-vis the canonical model found by Parker and Julliard (2005) for US Fama-French portfolios. A comparison to plots for the larger set of test assets (Figure 1) illustrates the negative

[19] A major disadvantage of Fama and French's three factor model is that there is still no full agreement in the literature about what the true risks underlying SMB and HML actually are. See, e.g., Petkova (2006) for a risk-based explanation in an empirical implementation of an ICAPM in the spirit of Merton (1973).

[20] However, models using macroeconomic factors will always be at a disadvantage to models using financial factors (Cochrane, 2007, p.7) due to a less precise measurement of macroeconomic variables. Moreover, these models allow for a more structural analysis of the economic determinants of risk premia, which typically cannot be delivered by models using merely financial factors.

effect of including industry portfolios in the case of the US. However, this adverse effect does not appear to be uniform across countries and models. Comparing pricing error plots for the UK and Germany, we find that the cross-sectional explanatory power of the traditional model appears to be lower (higher) when tested on UK (German) value and size portfolios only. While the inclusion of industry portfolios clearly weakens the empirical performance of the long-horizon model in the US, this conclusion does not hold for the two European markets.

[Insert Figure 4 about here]

5 Conclusion

Recent work by Parker and Julliard (2005) suggests that measuring consumption growth over several quarters following the return substantially improves the explanatory power of the consumption-based asset pricing paradigm. Their modified empirical setup adresses the issue of measurement error in quarterly consumption and is robust to various arguments as to why consumption expenditure may be slow to adjust to innovations in aggregate wealth. Besides, their model is closely related to the literature on long-run consumption risk, as it implies expressions for expected returns that are similar to the testable implications of long-run risk models with recursive utility such as Hansen, Heaton, and Li (2008).

Our work contributes to the literature on long-run consumption risks in three respects: First, by expanding the set of test assets to include industry portfolios, we take into account recent criticism regarding the widespread use of value and size portfolios as test assets (Phalippou, 2007; Lewellen, Nagel, and Shanken, 2007). Under our modified empirical approach, we find that long-horizon consumption risk falls short of providing a complete account of the cross-section of expected returns. In this way, our findings suggest that the long-horizon consumption-based approach does not resolve the famous “value premium puzzle”.

Second, evaluating the proposed CCAPM separately for three countries enables us to compare results across capital markets. In this sense, our findings provide additional out-of-sample evidence and address potential data-snooping concerns. Empirical results for Germany and the UK indicate that measuring consumption risk over longer horizons indeed helps increase the empirical performance of the CCAPM, albeit at modest levels. For both markets, estimated coefficients of determination remain below those obtained for the factor model of Fama and French (1993).

Third, our analysis confirms the evidence of Parker and Julliard (2005), who find that point estimates of the investor's risk-aversion parameter vary with the time interval over which consumption growth is measured. In line with evidence reported by Rangvid (2008), we find that accounting for long-horizon consumption risk typically delivers more sensible estimates. This is true for all three equity markets considered in this study.

Summing up, accounting for long-horizon consumption risk within the CCAPM framework indeed seems to improve the model's cross-sectional explanatory power in certain ways. On the one hand, the model still falls short of providing an accurate description of size and value premia. On the other hand, the estimated risk aversion of an investor who is concerned about long-run consumption risk is much lower and therefore more plausible compared to the standard model. In this sense, long-horizon consumption risk appears to be a more accurate measure of macroeconomic risk factors in stock returns than contemporaneous consumption growth.

References

Allen, F., and D. Gale (2001): *Comparing Financial Systems.* MIT Press.

Bansal, R. (2007): "Long-Run Risk and Financial Markets," NBER Working Paper 13196, National Bureau of Economic Research.

Bansal, R., R. Dittmar, and D. Kiku (2007): "Cointegration and Consumption Risks in Asset Returns," Forthcoming in Review of Financial Studies.

Bansal, R., R. F. Dittmar, and C. T. Lundblad (2005): "Consumption, Dividends, and the Cross Section of Equity Returns," *Journal of Finance*, 60(4), 1639–1672.

Bansal, R., D. Kiku, and A. Yaron (2007): "Risks For the Long Run: Estimation and Inference," Working paper, University of Pennsylvania.

Bansal, R., and A. Yaron (2004): "Risks for the Long Run: A Potential Resolution of Asset Pricing Puzzles," *Journal of Finance*, 59(4), 1481–1509.

Breeden, D. T. (1979): "An Intertemporal Asset Pricing Model with Stochastic Consumption and Investment Opportunities," *Journal of Financial Economics*, 7, 265–96.

Chetty, R., and A. Szeidl (2005): "Consumption Commitments: Neoclassical Foundations for Habit Formation," Working paper, UC Berkeley.

Cochrane, J. H. (1989): "The Sensitivity of Tests of the Intertemporal Allocation of Consumption to Near-Rational Alternatives," *American Economic Review*, 79(3), 319 – 337.

——— (1996): "A Cross-Sectional Test of an Investment-Based Asset Pricing Model," *Journal of Political Economy*, 104(3), 572–621.

——— (2005): *Asset Pricing.* Princeton University Press, Princeton, NJ.

——— (2007): "Financial Markets and the Real Economy," in *Handbook of the Equity Premium*, ed. by R. Mehra, pp. 237–325. Elsevier.

Colacito, R., and M. M. Croce (2008): "Risks For The Long Run And The Real Exchange Rate," Discussion paper, UNC.

Dimson, E., P. Marsh, and M. Staunton (2008): "The Worldwide Equity Premium Puzzle: A Smaller Puzzle," in *Handbook of the Equity Risk Premium*, ed. by R. Mehra. Elsevier.

DIMSON, E., S. NAGEL, AND G. QUIGLEY (2003): "Capturing the Value Premium in the United Kingdom," *Financial Analysts Journal*, 59(6), 35 – 45.

EPSTEIN, L., AND S. ZIN (1989): "Substitution, Risk Aversion, and the Temporal Behavior of Consumption Growth and Asset Returns I: A Theoretical Framework," *Econometrica*, 57, 937–969.

FAMA, E. F., AND K. R. FRENCH (1993): "Common Risk Factors in the Returns on Stocks and Bonds," *Journal of Financial Economics*, 33, 3–56.

GAO, P., AND K. X. HUANG (2004): "Aggregate Consumption-Wealth Ratio and the Cross-Section of Stock Returns: Some International Evidence," Working Paper RWP 04-07, Federal Reserve Bank of Kansas City, Kansas City, MO.

GROSSMAN, S. J., AND R. J. SHILLER (1982): "The Determinants of the Variability of Stock Market Prices," *American Economic Review*, 71, 222–227.

GUISO, L., M. HALIASSOS, AND T. JAPPELLI (2003): "Household Stockholding in Europe: Where Do We Stand and Where Do We Go?," *Economic Policy*, pp. 123 – 170.

HAMBURG, B., M. HOFFMANN, AND J. KELLER (2008): "Consumption, Wealth and Business Cycles in Germany," *Empirical Economics*, (34), 451 – 476.

HANSEN, L. P. (1982): "Large Sample Properties of Generalized Method of Moments Estimators," *Econometrica*, 50(4), 1029–1054.

HANSEN, L. P., J. C. HEATON, AND N. LI (2008): "Consumption Strikes Back?: Measuring Long-Run Risk," Forthcoming in Journal of Political Economy.

HANSEN, L. P., AND R. JAGANNATHAN (1997): "Assessing Specification Errors in Stochastic Discount Factor Models," *Journal of Finance*, 52(2), 557–590.

HANSEN, L. P., AND K. J. SINGLETON (1983): "Stochastic Consumption, Risk Aversion, and the Temporal Behavior of Asset Returns," *Journal of Political Economy*, 91, 249–265.

HYDE, S., AND M. SHERIF (2005a): "Consumption Asset Pricing Models: Evidence from the UK," *The Manchester School*, 73(3), 343 – 363.

——— (2005b): "Don't Break the Habit: Structual Stability Tests of Consumption Asset Pricing Models in the UK," *Applied Economics Letters*, 12, 289–296.

Jagannathan, R., and Y. Wang (2007): “Lazy Investors, Discretionary Consumption, and the Cross-Section of Stock Returns,” *Journal of Finance*, 62(4), 1623–1661.

Kaltenbrunner, G., and L. A. Lochstoer (2007): “Long-Run Risk Through Consumption Smoothing,” Working paper, London Business School.

Lettau, M., and S. Ludvigson (2001): “Ressurrecting the (C)CAPM: A Cross-Sectional Test when Risk Premia Are Time-Varying,” *Journal of Political Economy*, 109, 1238–1287.

Lewellen, J., S. Nagel, and J. Shanken (2007): “A Skeptical Appraisal of Asset-Pricing Tests,” Working paper, Stanford.

Lucas, Robert E., J. (1978): “Asset Prices in an Exchange Economy,” *Econometrica*, 46(6), 1429–1445.

Lund, J., and T. Engsted (1996): “GMM and Present Value Tests of the C-CAPM: Evidence from the Danish, German, Swedish and UK Stock Markets,” *Journal of International Money and Finance*, 15(4), 497 – 521.

Malloy, C. J., T. J. Moskowitz, and A. Vissing-Jørgensen (2008): “Long-Run Stockholder Consumption Risk and Asset Returns,” Working paper, Northwestern University.

Mehra, R., and E. Prescott (1985): “The Equity Premium: A Puzzle,” *Journal of Monetary Economics*, 15, 145–161.

Merton, R. C. (1973): “An Intertemporal Capital Asset Pricing Model,” *Econometrica*, 41(5), 867–887.

Newey, W. K., and K. D. West (1987): “A Simple, Positive Semi-Definite, Heteroskedasticity and Autocorrelation Consistent Covariance Matrix,” *Econometrica*, 55(3), 703–708.

Parker, J. A., and C. Julliard (2005): “Consumption Risk and the Cross Section of Expected Returns,” *Journal of Political Economy*, 113(1), 185 – 222.

Petkova, R. G. (2006): “Do the Fama-French Factors Proxy for Innovations in Predictive Variables?,” *Journal of Finance*, 61(2), 581–612.

Phalippou, L. (2007): “Can Risk-Based Theories Explain the Value Premium?,” *Review of Finance*, 11, 143 – 166.

Rangvid, J. (2008): "The Long-Run World Consumption Risk of International Stock Markets," Working paper, Copenhagen Business School.

Rubinstein, M. (1976): "The Valuation of Uncertain Income Streams and the Pricing of Options," *Bell Journal of Economics*, 7, 407–425.

Schrimpf, A., M. Schröder, and R. Stehle (2007): "Cross-Sectional Tests of Conditional Asset Pricing Models: Evidence from the German Stock Market," *European Financial Management*, 13(5), 880–907.

Stock, J. H., and M. W. Watson (2003): "Forecasting Output and Inflation: The Role of Asset Prices," *Journal of Economic Literature*, 151, 788–829.

Yogo, M. (2006): "A Consumption-based Explanation of Expected Stock Returns," *Journal of Finance*, 61(2), 539–580.

Tables and Figures

Table 1: Consumption Risk and US Stock Returns - Nonlinear LH-CCAPM

Horizon	$\hat{\alpha}$ (std. err.)	$\hat{\gamma}$ (std. err.)	R^2	RMSE	HJ-Dist. (p-value)	J (p-value)
0	0.022	47.047	0.08	0.521	0.588	112.032
	(0.005)	(60.748)			(0.000)	(0.000)
1	0.019	29.839	0.09	0.518	0.586	106.706
	(0.005)	(29.742)			(0.001)	(0.000)
3	0.019	21.765	0.09	0.516	0.589	112.762
	(0.006)	(21.792)			(0.001)	(0.000)
5	0.018	20.357	0.11	0.512	0.586	109.375
	(0.005)	(18.600)			(0.005)	(0.000)
7	0.018	20.717	0.15	0.500	0.584	108.276
	(0.005)	(15.650)			(0.011)	(0.000)
9	0.020	20.512	0.18	0.491	0.584	110.046
	(0.004)	(12.487)			(0.014)	(0.000)
11	0.020	20.229	0.20	0.484	0.579	105.909
	(0.004)	(10.997)			(0.032)	(0.000)

Note: The reported values for $\hat{\alpha}$, $\hat{\gamma}$, R^2, and the Root Mean Squared Error (RMSE) are computed using equal weights across portfolios and large weight on the last moment (first stage GMM with a prespecified weighting matrix). Standard errors are calculated using the procedure by Newey and West (1987) with S+1 lags. The HJ-Distance is based on first stage GMM estimation using the weighting matrix proposed by Hansen and Jagannathan (1997) and p-values are obtained via simulation with 10,000 replications. The J-statistic is based on iterated GMM estimation. The sample period is 1947:Q2 - 2001:Q4 for returns and 1947:Q2 - 2004:Q3 for quarterly consumption.

Table 2: Consumption Risk and UK Stock Returns - Nonlinear LH-CCAPM

Horizon	$\hat{\alpha}$ (std. err.)	$\hat{\gamma}$ (std. err.)	R^2	RMSE	HJ-Dist. (p-value)	J (p-value)
0	0.025	14.787	0.09	0.671	0.505	48.102
	(0.009)	(27.133)			(0.025)	(0.001)
1	0.024	3.685	0.01	0.700	0.501	45.177
	(0.009)	(22.583)			(0.034)	(0.002)
3	0.021	15.012	0.14	0.654	0.500	49.357
	(0.010)	(17.637)			(0.030)	(0.000)
5	0.023	5.651	0.05	0.686	0.498	47.964
	(0.008)	(14.625)			(0.035)	(0.001)
7	0.021	8.950	0.13	0.656	0.497	48.309
	(0.008)	(12.054)			(0.036)	(0.001)
9	0.023	4.517	0.07	0.680	0.499	47.405
	(0.007)	(11.782)			(0.029)	(0.001)
11	0.022	5.036	0.09	0.671	0.496	47.800
	(0.007)	(12.011)			(0.027)	(0.001)

Note: The reported values for $\hat{\alpha}$, $\hat{\gamma}$, R^2, and the Root Mean Squared Error (RMSE) are computed using equal weights across portfolios and large weight on the last moment (first stage GMM with a prespecified weighting matrix). Standard errors are calculated using the procedure by Newey and West (1987) with S+1 lags. The HJ-Distance is based on first stage GMM estimation using the weighting matrix proposed by Hansen and Jagannathan (1997) and p-values are obtained via simulation with 10,000 replications. The J-statistic is based on iterated GMM estimation. The sample period is 1965:Q2 - 2001:Q1 for returns and 1965:Q2 - 2003:Q4 for quarterly consumption.

Table 3: Consumption Risk and German Stock Returns - Nonlinear LH-CCAPM

Horizon	$\hat{\alpha}$ (std. err.)	$\hat{\gamma}$ (std. err.)	R^2	RMSE	HJ-Dist. (p-value)	J (p-value)
0	0.015	61.927	0.09	0.730	0.544	61.121
	(0.009)	(31.840)			(0.362)	(0.000)
1	0.013	59.990	0.16	0.701	0.545	43.436
	(0.008)	(36.956)			(0.317)	(0.017)
3	0.013	27.586	0.05	0.744	0.545	97.116
	(0.008)	(37.379)			(0.275)	(0.000)
5	0.013	11.850	0.05	0.745	0.552	44.760
	(0.008)	(27.171)			(0.216)	(0.013)
7	0.010	17.963	0.12	0.718	0.554	46.184
	(0.006)	(19.539)			(0.205)	(0.009)
9	0.012	11.482	0.09	0.726	0.551	45.088
	(0.006)	(16.736)			(0.203)	(0.012)
11	0.007	19.987	0.22	0.675	0.552	46.216
	(0.004)	(17.863)			(0.208)	(0.009)

Note: The reported values for $\hat{\alpha}$, $\hat{\gamma}$, R^2, and the Root Mean Squared Error (RMSE) are computed using equal weights across portfolios and large weight on the last moment (first stage GMM with a prespecified weighting matrix). Standard errors are calculated using the procedure by Newey and West (1987) with S+1 lags. The HJ-Distance is based on first stage GMM estimation using the weighting matrix proposed by Hansen and Jagannathan (1997) and p-values are obtained via simulation with 10,000 replications. The J-statistic is based on iterated GMM estimation. The sample period is 1974:Q2 - 2001:Q1 for returns and 1974:Q2 - 2003:Q4 for quarterly consumption.

Table 4: Consumption Risk and US Stock Returns - Linearized LH-CCAPM: GMM Estimation

Horizon	$\hat{\alpha}$ (std. err.)	$\hat{b}$ (std. err.)	$\gamma_S^{implied}$ (std. err.)	R^2	RMSE	HJ-Dist. (p-value)	J (p-value)
0	0.020	75.573	54.076	0.12	0.508	0.474	120.940
	(0.005)	(64.405)	(32.733)			(0.019)	(0.000)
1	0.020	30.132	22.896	0.08	0.520	0.565	108.800
	(0.005)	(33.567)	(19.249)			(0.002)	(0.000)
3	0.019	20.887	14.499	0.09	0.517	0.587	113.112
	(0.005)	(21.557)	(10.264)			(0.002)	(0.000)
5	0.019	18.211	11.544	0.09	0.517	0.583	109.064
	(0.005)	(18.436)	(7.293)			(0.007)	(0.000)
7	0.018	19.611	10.716	0.13	0.506	0.582	108.482
	(0.005)	(17.041)	(4.966)			(0.012)	(0.000)
9	0.019	21.438	10.038	0.17	0.494	0.583	110.078
	(0.005)	(14.946)	(3.142)			(0.014)	(0.000)
11	0.019	22.500	9.236	0.21	0.482	0.578	107.345
	(0.005)	(13.000)	(2.072)			(0.030)	(0.000)

Note: The reported values for $\hat{\alpha}$, $\hat{b}$, $\gamma_S^{implied}$, R^2, and the Root Mean Squared Error (RMSE) are computed using equal weights across portfolios (first stage GMM with a prespecified weighting matrix). Standard errors are calculated using the procedure by Newey and West (1987) with S+1 lags. The HJ-Distance is based on first stage GMM estimation using the weighting matrix proposed by Hansen and Jagannathan (1997) and p-values are obtained via simulation with 10,000 replications. The J-statistic is based on iterated GMM estimation. The risk-free rate is assumed to be constant. The sample period is 1947:Q2 - 2001:Q4 for returns and 1947:Q2 - 2004:Q3 for quarterly consumption.

Table 5: Consumption Risk and UK Stock Returns - Linearized LH-CCAPM: GMM Estimation

Horizon	$\hat{\alpha}$	$\hat{b}$	$\gamma_S^{implied}$	R^2	RMSE	HJ-Dist.	J
	(std. err.)	(std. err.)	(std. err.)			(p-value)	(p-value)
0	0.025	17.255	15.771	0.09	0.671	0.505	48.135
	(0.009)	(34.993)	(29.159)			(0.028)	(0.001)
1	0.025	4.295	4.101	0.00	0.703	0.500	45.940
	(0.009)	(23.865)	(21.753)			(0.038)	(0.001)
3	0.021	15.448	11.531	0.12	0.661	0.504	49.325
	(0.010)	(19.431)	(10.654)			(0.027)	(0.000)
5	0.023	7.301	5.882	0.03	0.693	0.503	48.214
	(0.009)	(15.406)	(9.920)			(0.031)	(0.001)
7	0.021	7.960	5.890	0.09	0.672	0.504	48.869
	(0.009)	(12.344)	(6.660)			(0.032)	(0.001)
9	0.022	4.805	3.799	0.03	0.695	0.505	48.089
	(0.008)	(12.396)	(7.701)			(0.029)	(0.001)
11	0.021	5.436	4.001	0.03	0.694	0.506	48.291
	(0.008)	(11.685)	(6.275)			(0.026)	(0.001)

Note: The reported values for $\hat{\alpha}$, $\hat{b}$, $\gamma_S^{implied}$, R^2, and the Root Mean Squared Error (RMSE) are computed using equal weights across portfolios (first stage GMM with a prespecified weighting matrix). Standard errors are calculated using the procedure by Newey and West (1987) with S+1 lags. The HJ-Distance is based on first stage GMM estimation using the weighting matrix proposed by Hansen and Jagannathan (1997) and p-values are obtained via simulation with 10,000 replications. The J-statistic is based on iterated GMM estimation. The risk-free rate is assumed to be constant. The sample period is 1965:Q2 - 2001:Q1 for returns and 1965:Q2 - 2003:Q4 for quarterly consumption.

Table 6: Consumption Risk and German Stock Returns - Linearized LH-CCAPM: GMM Estimation

Horizon	$\hat{\alpha}$ (std. err.)	$\hat{b}$ (std. err.)	$\gamma_S^{implied}$ (std. err.)	R^2	RMSE	HJ-Dist. (p-value)	J (p-value)
0	0.014	24.194	21.639	0.01	0.758	0.534	45.299
	(0.009)	(42.199)	(33.678)			(0.296)	(0.011)
1	0.015	76.771	44.036	0.16	0.701	0.527	44.223
	(0.010)	(50.094)	(16.159)			(0.385)	(0.014)
3	0.013	21.763	15.372	0.02	0.757	0.544	41.935
	(0.008)	(32.764)	(16.157)			(0.261)	(0.025)
5	0.013	15.934	10.996	0.03	0.754	0.551	42.565
	(0.008)	(29.381)	(13.839)			(0.221)	(0.021)
7	0.010	19.573	11.373	0.09	0.730	0.556	46.847
	(0.006)	(20.279)	(6.591)			(0.200)	(0.007)
9	0.012	13.894	8.527	0.05	0.743	0.555	45.917
	(0.006)	(17.544)	(6.404)			(0.193)	(0.009)
11	0.006	22.898	10.290	0.20	0.683	0.555	46.934
	(0.004)	(16.149)	(3.074)			(0.204)	(0.007)

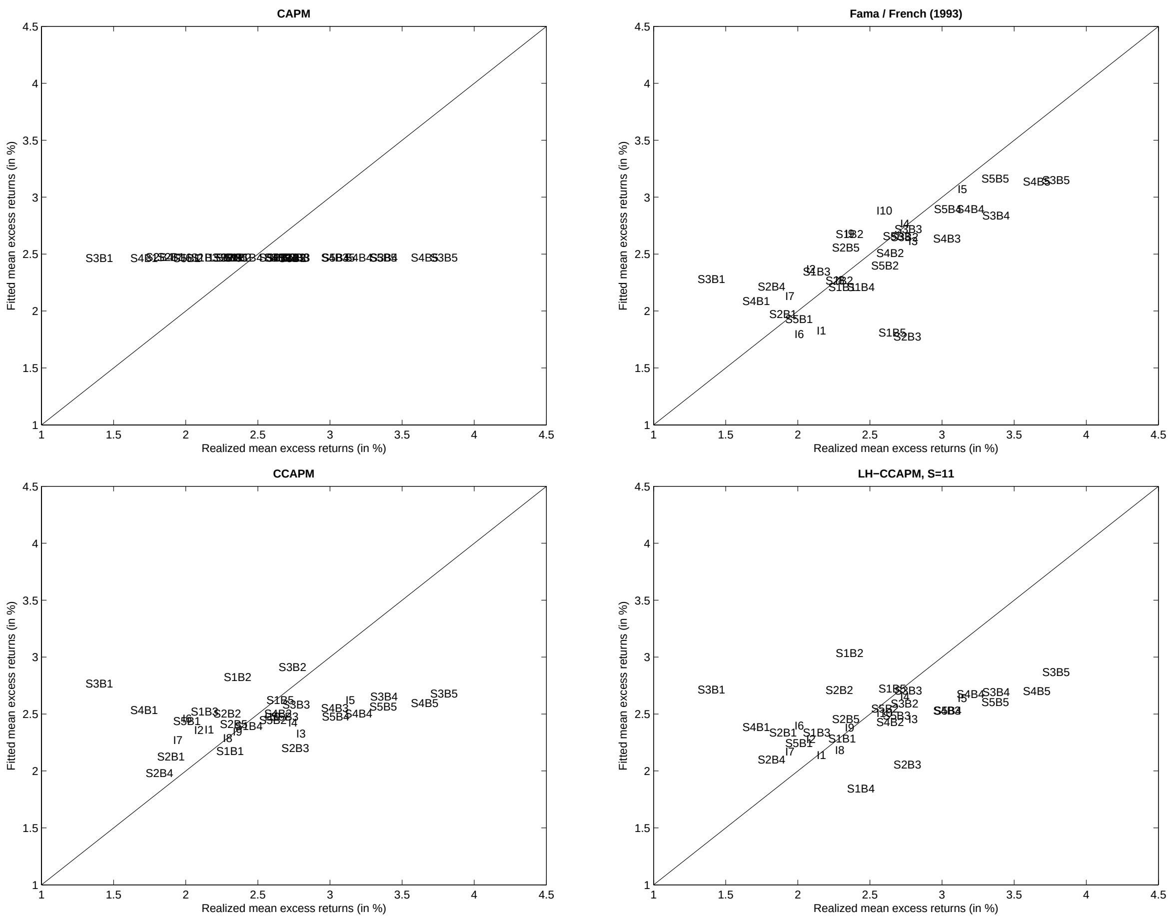
Note: The reported values for $\hat{\alpha}$, $\hat{b}$, $\gamma_S^{implied}$, R^2, and the Root Mean Squared Error (RMSE) are computed using equal weights across portfolios (first stage GMM with a prespecified weighting matrix). Standard errors are calculated using the procedure by Newey and West (1987) with S+1 lags. The HJ-Distance is based on first stage GMM estimation using the weighting matrix proposed by Hansen and Jagannathan (1997) and p-values are obtained via simulation with 10,000 replications. The J-statistic is based on iterated GMM estimation. The risk-free rate is assumed to be constant. The sample period is 1974:Q2 - 2001:Q1 for returns and 1974:Q2 - 2003:Q4 for quarterly consumption.

Table 7: Traditional Linear Factor Models and German, UK and US Stock Returns - GMM Estimation, Size/Book-to-Market and Industry Portfolios.

Model	$\hat{\alpha}$ (std. err.)	$\hat{b}_{m,e}$ (std. err.)	$\hat{b}_{SMB}$ (std. err.)	$\hat{b}_{HML}$ (std. err.)	R^2	RMSE	HJ-Dist. (p-value)	J (p-value)
A. United States								
Fama-French	0.017	1.356	0.693	4.017	0.56	0.361	0.568	94.449
	(0.007)	(1.748)	(1.715)	(1.598)			(0.001)	(0.000)
CAPM	0.025	−0.014			0.00	0.542	0.587	112.784
	(0.008)	(1.513)					(0.000)	(0.000)
B. United Kingdom								
Fama-French	0.016	0.871	1.247	6.289	0.71	0.380	0.428	36.235
	(0.010)	(1.090)	(2.057)	(3.472)			(0.190)	(0.010)
CAPM	0.021	0.410			0.06	0.682	0.505	49.077
	(0.010)	(0.933)					(0.029)	(0.000)
C. Germany								
Fama-French	−0.003	1.056	−4.731	3.342	0.70	0.419	0.515	35.499
	(0.007)	(2.078)	(3.611)	(2.529)			(0.332)	(0.065)
CAPM	−0.009	3.340			0.52	0.530	0.537	42.124
	(0.008)	(1.574)					(0.247)	(0.024)

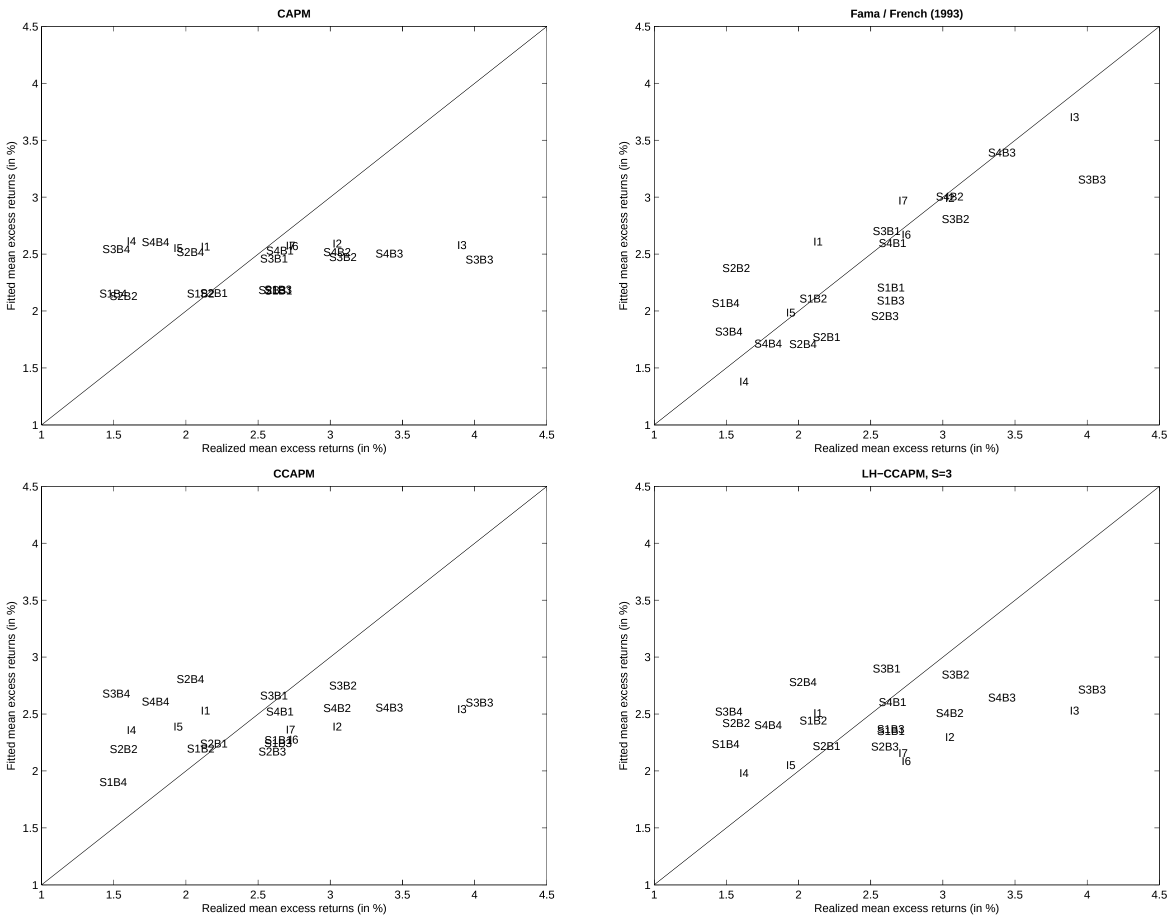
Note: The reported values for $\hat{\alpha}$, $\hat{b}_{m,e}$, $\hat{b}_{SMB}$, $\hat{b}_{HML}$, R^2, and the Root Mean Squared Error (RMSE) are computed using equal weights across portfolios (first stage GMM). The HJ-Distance is based on first stage GMM estimation using the weighting matrix proposed by Hansen and Jagannathan (1997), the J-statistic on iterated GMM estimation. The sample period is 1974:Q2 - 2001:Q1 for Germany, 1965:Q2 - 2001:Q1 for the UK, and 1947:Q2 - 2001:Q4 for the US.

Figure 1: Pricing Error Plots for US Stock Returns - Linearized LH-CCAPM and Traditional Linear Factor Models



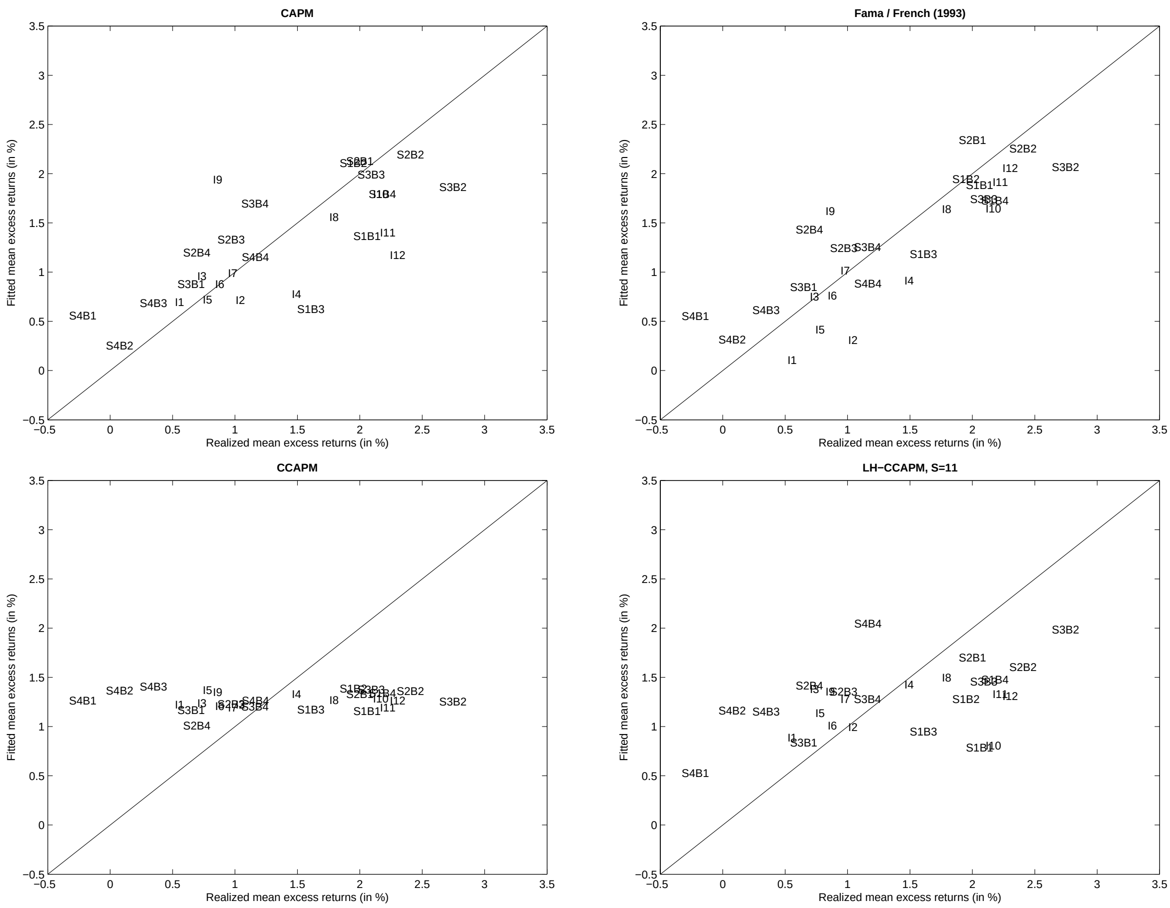
Note: The figure compares realized mean excess returns on 25 value and size as well as 10 industry portfolios to those predicted by the CAPM, the Fama and French (1993) model, and the linearized LH-CCAPM (with constant risk-free rate) at different horizons. The portfolios are depicted in the following way: e.g., S1B1 refers to stocks in the smallest size and book-to-market Quintiles, while S5B5 refers to stocks in the largest size and book-to-market Quintiles; industry portfolios are depicted as I plus the corresponding industry number running from 1 to 10. Fitted excess returns are based on first stage GMM estimation with identity weighting matrix. The sample period is 1947:Q2 - 2001:Q4.

Figure 2: Pricing Error Plots for UK Stock Returns - Linearized LH-CCAPM and Traditional Linear Factor Models



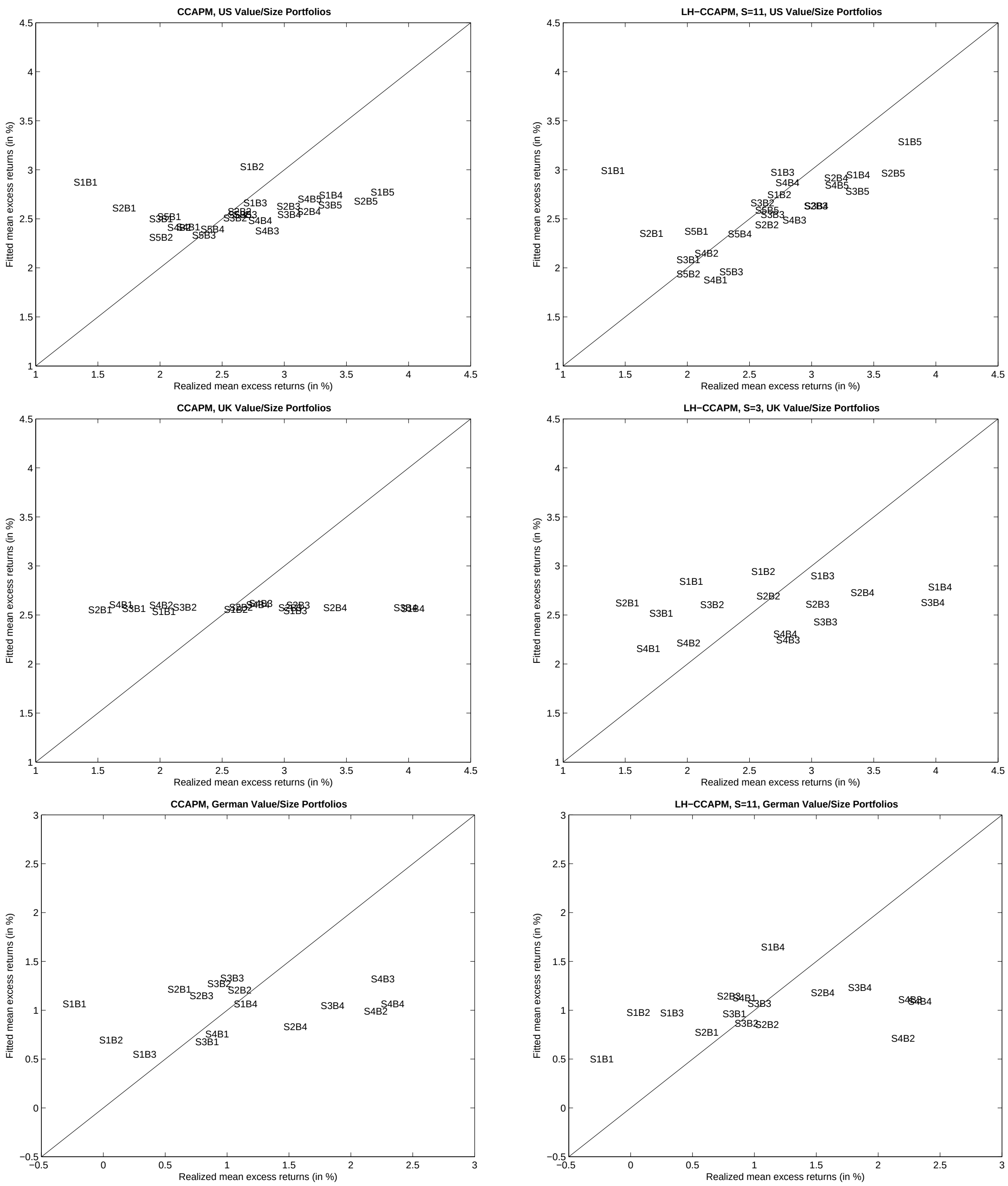
Note: The figure compares realized mean excess returns on 16 value and size as well as 7 industry portfolios to those predicted by the CAPM, the Fama and French (1993) model, and the linearized LH-CCAPM (with constant risk-free rate) at different horizons. The portfolios are depicted in the following way: e.g., S1B1 refers to stocks in the smallest size and book-to-market Quartiles, while S4B4 refers to stocks in the largest size and book-to-market Quartiles; industry portfolios are depicted as I plus the corresponding industry number running from 1 to 7. Fitted excess returns are based on first stage GMM estimation with identity weighting matrix. The sample period is 1965:Q2 - 2001:Q1.

Figure 3: Pricing Error Plots for German Stock Returns - Linearized LH-CCAPM and Traditional Linear Factor Models



Note: The figure compares realized mean excess returns on 16 value and size as well as 12 industry portfolios to those predicted by the CAPM, the Fama and French (1993) model, and the linearized LH-CCAPM (with constant risk-free rate) at different horizons. The portfolios are depicted in the following way: e.g., S1B1 refers to stocks in the smallest size and book-to-market Quartiles, while S4B4 refers to stocks in the largest size and book-to-market Quartiles; industry portfolios are depicted as I plus the corresponding industry number running from 1 to 12. Fitted excess returns are based on first stage GMM estimation with identity weighting matrix. The sample period is 1974:Q2 - 2001:Q1.

Figure 4: Linearized Consumption-Based Models: Pricing Error Plots for Value and Size Portfolios



Note: The figure compares realized mean excess returns to those predicted by the standard CCAPM (S=0) and the linearized LH-CCAPM (with constant risk-free rate and S=11), estimated on value and size portfolios. The portfolios are depicted in the following way: e.g., S1B1 refers to stocks in the smallest size and book-to-market Quartiles, while S4B4 (S5B5) refers to stocks in the largest size and book-to-market Quartiles. Fitted excess returns are based on first stage GMM estimation with identity weighting matrix.

cfr working paper series

centre for financial research cologne

cfr working papers are available for download from **www.cfr-cologne.de**.

Hardcopies can be ordered from: centre for financial research (cfr), Albertus Magnus Platz, 50923 Koeln, Germany.

2012

No.	Author(s)	Title
12-06	A. Kempf, A. Pütz, F. Sonnenburg	Fund Manager Duality: Impact on Performance and Investment Behavior
12-05	R. Wermers	Runs on Money Market Mutual Funds
12-04	R. Wermers	A matter of style: The causes and consequences of style drift in institutional portfolios
12-03	C. Andres, A. Betzer, I. van den Bongard, C. Haesner, E. Theissen	Dividend Announcements Reconsidered: Dividend Changes versus Dividend Surprises
12-02	C. Andres, E. Fernau, E. Theissen	Is It Better To Say Goodbye? When Former Executives Set Executive Pay
12-01	L. Andreu, A. Pütz	Are Two Business Degrees Better Than One? Evidence from Mutual Fund Managers' Education

2011

No.	Author(s)	Title
11-16	V. Agarwal, J.-P. Gómez, R. Priestley	Management Compensation and Market Timing under Portfolio Constraints
11-15	T. Dimpfl, S. Jank	Can Internet Search Queries Help to Predict Stock Market Volatility?
11-14	P. Gomber, U. Schweickert, E. Theissen	Liquidity Dynamics in an Electronic Open Limit Order Book: An Event Study Approach
11-13	D. Hess, S. Orbe	Irrationality or Efficiency of Macroeconomic Survey Forecasts? Implications from the Anchoring Bias Test
11-12	D. Hess, P. Immenkötter	Optimal Leverage, its Benefits, and the Business Cycle
11-11	N. Heinrichs, D. Hess, C. Homburg, M. Lorenz, S. Sievers	Extended Dividend, Cash Flow and Residual Income Valuation Models – Accounting for Deviations from Ideal Conditions
11-10	A. Kempf, O. Korn, S. Saßning	Portfolio Optimization using Forward - Looking Information

11-09	V. Agarwal, S. Ray	Determinants and Implications of Fee Changes in the Hedge Fund Industry
11-08	G. Cici, L.-F. Palacios	On the Use of Options by Mutual Funds: Do They Know What They Are Doing?
11-07	V. Agarwal, G. D. Gay, L. Ling	Performance inconsistency in mutual funds: An investigation of window-dressing behavior
11-06	N. Hautsch, D. Hess, D. Veredas	The Impact of Macroeconomic News on Quote Adjustments, Noise, and Informational Volatility
11-05	G. Cici	The Prevalence of the Disposition Effect in Mutual Funds' Trades
11-04	S. Jank	Mutual Fund Flows, Expected Returns and the Real Economy
11-03	G.Fellner, E.Theissen	Short Sale Constraints, Divergence of Opinion and Asset Value: Evidence from the Laboratory
11-02	S.Jank	Are There Disadvantaged Clienteles in Mutual Funds?
11-01	V. Agarwal, C. Meneghetti	The Role of Hedge Funds as Primary Lenders

2010

No.	Author(s)	Title
10-20	G. Cici, S. Gibson, J.J. Merrick Jr.	Missing the Marks? Dispersion in Corporate Bond Valuations Across Mutual Funds
10-19	J. Hengelbrock, E. Theissen, C. Westheide	Market Response to Investor Sentiment
10-18	G. Cici, S. Gibson	The Performance of Corporate-Bond Mutual Funds: Evidence Based on Security-Level Holdings
10-17	D. Hess, D. Kreutzmann, O. Pucker	Projected Earnings Accuracy and the Profitability of Stock Recommendations
10-16	S. Jank, M. Wedow	Sturm und Drang in Money Market Funds: When Money Market Funds Cease to Be Narrow
10-15	G. Cici, A. Kempf, A. Puetz	The Valuation of Hedge Funds' Equity Positions
10-14	J. Grammig, S. Jank	Creative Destruction and Asset Prices
10-13	S. Jank, M. Wedow	Purchase and Redemption Decisions of Mutual Fund Investors and the Role of Fund Families
10-12	S. Artmann, P. Finter, A. Kempf, S. Koch, E. Theissen	The Cross-Section of German Stock Returns: New Data and New Evidence
10-11	M. Chesney, A. Kempf	The Value of Tradeability
10-10	S. Frey, P. Herbst	The Influence of Buy-side Analysts on Mutual Fund Trading
10-09	V. Agarwal, W. Jiang, Y. Tang, B. Yang	Uncovering Hedge Fund Skill from the Portfolio Holdings They Hide
10-08	V. Agarwal, V. Fos, W. Jiang	Inferring Reporting Biases in Hedge Fund Databases from Hedge Fund Equity Holdings
10-07	V. Agarwal, G. Bakshi,	Do Higher-Moment Equity Risks Explain Hedge Fund

	J. Huij	Returns?
10-06	J. Grammig, F. J. Peter	Tell-Tale Tails
10-05	K. Drachter, A. Kempf	Höhe, Struktur und Determinanten der Managervergütung- Eine Analyse der Fondsbranche in Deutschland
10-04	J. Fang, A. Kempf, M. Trapp	Fund Manager Allocation
10-03	P. Finter, A. Niessen-Ruenzi, S. Ruenzi	The Impact of Investor Sentiment on the German Stock Market
10-02	D. Hunter, E. Kandel, S. Kandel, R. Wermers	Endogenous Benchmarks
10-01	S. Artmann, P. Finter, A. Kempf	Determinants of Expected Stock Returns: Large Sample Evidence from the German Market

2009

No.	Author(s)	Title
09-17	E. Theissen	Price Discovery in Spot and Futures Markets: A Reconsideration
09-16	M. Trapp	Trading the Bond-CDS Basis – The Role of Credit Risk and Liquidity
09-15	A. Betzer, J. Gider, D.Metzger, E. Theissen	Strategic Trading and Trade Reporting by Corporate Insiders
09-14	A. Kempf, O. Korn, M. Uhrig-Homburg	The Term Structure of Illiquidity Premia
09-13	W. Bühler, M. Trapp	Time-Varying Credit Risk and Liquidity Premia in Bond and CDS Markets
09-12	W. Bühler, M. Trapp	Explaining the Bond-CDS Basis – The Role of Credit Risk and Liquidity
09-11	S. J. Taylor, P. K. Yadav, Y. Zhang	Cross-sectional analysis of risk-neutral skewness
09-10	A. Kempf, C. Merkle, A. Niessen-Ruenzi	Low Risk and High Return – Affective Attitudes and Stock Market Expectations
09-09	V. Fotak, V. Raman, P. K. Yadav	Naked Short Selling: The Emperor`s New Clothes?
09-08	F. Bardong, S.M. Bartram, P.K. Yadav	Informed Trading, Information Asymmetry and Pricing of Information Risk: Empirical Evidence from the NYSE
09-07	S. J. Taylor , P. K. Yadav, Y. Zhang	The information content of implied volatilities and model-free volatility expectations: Evidence from options written on individual stocks
09-06	S. Frey, P. Sandas	The Impact of Iceberg Orders in Limit Order Books
09-05	H. Beltran-Lopez, P. Giot, J. Grammig	Commonalities in the Order Book
09-04	J. Fang, S. Ruenzi	Rapid Trading bei deutschen Aktienfonds: Evidenz aus einer großen deutschen Fondsgesellschaft
09-03	A. Banegas, B. Gillen, A. Timmermann, R. Wermers	The Performance of European Equity Mutual Funds

09-02	J. Grammig, A. Schrimpf, M. Schuppli	Long-Horizon Consumption Risk and the Cross-Section of Returns: New Tests and International Evidence
09-01	O. Korn, P. Koziol	The Term Structure of Currency Hedge Ratios

2008

No.	Author(s)	Title
08-12	U. Bonenkamp, C. Homburg, A. Kempf	Fundamental Information in Technical Trading Strategies
08-11	O. Korn	Risk Management with Default-risky Forwards
08-10	J. Grammig, F.J. Peter	International Price Discovery in the Presence of Market Microstructure Effects
08-09	C. M. Kuhnen, A. Niessen	Public Opinion and Executive Compensation
08-08	A. Pütz, S. Ruenzi	Overconfidence among Professional Investors: Evidence from Mutual Fund Managers
08-07	P. Osthoff	What matters to SRI investors?
08-06	A. Betzer, E. Theissen	Sooner Or Later: Delays in Trade Reporting by Corporate Insiders
08-05	P. Linge, E. Theissen	Determinanten der Aktionärspräsenz auf Hauptversammlungen deutscher Aktiengesellschaften
08-04	N. Hautsch, D. Hess, C. Müller	Price Adjustment to News with Uncertain Precision
08-03	D. Hess, H. Huang, A. Niessen	How Do Commodity Futures Respond to Macroeconomic News?
08-02	R. Chakrabarti, W. Megginson, P. Yadav	Corporate Governance in India
08-01	C. Andres, E. Theissen	Setting a Fox to Keep the Geese - Does the Comply-or-Explain Principle Work?

2007

No.	Author(s)	Title
07-16	M. Bär, A. Niessen, S. Ruenzi	The Impact of Work Group Diversity on Performance: Large Sample Evidence from the Mutual Fund Industry
07-15	A. Niessen, S. Ruenzi	Political Connectedness and Firm Performance: Evidence From Germany
07-14	O. Korn	Hedging Price Risk when Payment Dates are Uncertain
07-13	A. Kempf, P. Osthoff	SRI Funds: Nomen est Omen
07-12	J. Grammig, E. Theissen, O. Wuensche	Time and Price Impact of a Trade: A Structural Approach
07-11	V. Agarwal, J. R. Kale	On the Relative Performance of Multi-Strategy and Funds of Hedge Funds
07-10	M. Kasch-Haroutounian, E. Theissen	Competition Between Exchanges: Euronext versus Xetra
07-09	V. Agarwal, N. D. Daniel, N. Y. Naik	Do hedge funds manage their reported returns?

07-08	N. C. Brown, K. D. Wei, R. Wermers	Analyst Recommendations, Mutual Fund Herding, and Overreaction in Stock Prices
07-07	A. Betzer, E. Theissen	Insider Trading and Corporate Governance: The Case of Germany
07-06	V. Agarwal, L. Wang	Transaction Costs and Value Premium
07-05	J. Grammig, A. Schrimpf	Asset Pricing with a Reference Level of Consumption: New Evidence from the Cross-Section of Stock Returns
07-04	V. Agarwal, N.M. Boyson, N.Y. Naik	Hedge Funds for retail investors? An examination of hedged mutual funds
07-03	D. Hess, A. Niessen	The Early News Catches the Attention: On the Relative Price Impact of Similar Economic Indicators
07-02	A. Kempf, S. Ruenzi, T. Thiele	Employment Risk, Compensation Incentives and Managerial Risk Taking - Evidence from the Mutual Fund Industry -
07-01	M. Hagemeister, A. Kempf	CAPM und erwartete Renditen: Eine Untersuchung auf Basis der Erwartung von Marktteilnehmern

2006

No.	Author(s)	Title
06-13	S. Čeljo-Hörhager, A. Niessen	How do Self-fulfilling Prophecies affect Financial Ratings? - An experimental study
06-12	R. Wermers, Y. Wu, J. Zechner	Portfolio Performance, Discount Dynamics, and the Turnover of Closed-End Fund Managers
06-11	U. v. Lilienfeld-Toal, S. Ruenzi	Why Managers Hold Shares of Their Firm: An Empirical Analysis
06-10	A. Kempf, P. Osthoff	The Effect of Socially Responsible Investing on Portfolio Performance
06-09	R. Wermers, T. Yao, J. Zhao	Extracting Stock Selection Information from Mutual Fund holdings: An Efficient Aggregation Approach
06-08	M. Hoffmann, B. Kempa	The Poole Analysis in the New Open Economy Macroeconomic Framework
06-07	K. Drachter, A. Kempf, M. Wagner	Decision Processes in German Mutual Fund Companies: Evidence from a Telephone Survey
06-06	J.P. Krahnen, F.A. Schmid, E. Theissen	Investment Performance and Market Share: A Study of the German Mutual Fund Industry
06-05	S. Ber, S. Ruenzi	On the Usability of Synthetic Measures of Mutual Fund Net-Flows
06-04	A. Kempf, D. Mayston	Liquidity Commonality Beyond Best Prices
06-03	O. Korn, C. Koziol	Bond Portfolio Optimization: A Risk-Return Approach
06-02	O. Scaillet, L. Barras, R. Wermers	False Discoveries in Mutual Fund Performance: Measuring Luck in Estimated Alphas
06-01	A. Niessen, S. Ruenzi	Sex Matters: Gender Differences in a Professional Setting

2005

No.	Author(s)	Title
05-16	E. Theissen	An Analysis of Private Investors´ Stock Market Return Forecasts

05-15	T. Foucault, S. Moinas, E. Theissen	Does Anonymity Matter in Electronic Limit Order Markets
05-14	R. Kosowski, A. Timmermann, R. Wermers, H. White	Can Mutual Fund „Stars“ Really Pick Stocks? New Evidence from a Bootstrap Analysis
05-13	D. Avramov, R. Wermers	Investing in Mutual Funds when Returns are Predictable
05-12	K. Griese, A. Kempf	Liquiditätsdynamik am deutschen Aktienmarkt
05-11	S. Ber, A. Kempf, S. Ruenzi	Determinanten der Mittelzuflüsse bei deutschen Aktienfonds
05-10	M. Bär, A. Kempf, S. Ruenzi	Is a Team Different From the Sum of Its Parts? Evidence from Mutual Fund Managers
05-09	M. Hoffmann	Saving, Investment and the Net Foreign Asset Position
05-08	S. Ruenzi	Mutual Fund Growth in Standard and Specialist Market Segments
05-07	A. Kempf, S. Ruenzi	Status Quo Bias and the Number of Alternatives - An Empirical Illustration from the Mutual Fund Industry
05-06	J. Grammig, E. Theissen	Is Best Really Better? Internalization of Orders in an Open Limit Order Book
05-05	H. Beltran-Lopez, J. Grammig, A.J. Menkveld	Limit order books and trade informativeness
05-04	M. Hoffmann	Compensating Wages under different Exchange rate Regimes
05-03	M. Hoffmann	Fixed versus Flexible Exchange Rates: Evidence from Developing Countries
05-02	A. Kempf, C. Memmel	Estimating the Global Minimum Variance Portfolio
05-01	S. Frey, J. Grammig	Liquidity supply and adverse selection in a pure limit order book market

2004

No.	Author(s)	Title
04-10	N. Hautsch, D. Hess	Bayesian Learning in Financial Markets – Testing for the Relevance of Information Precision in Price Discovery
04-09	A. Kempf, K. Kreuzberg	Portfolio Disclosure, Portfolio Selection and Mutual Fund Performance Evaluation
04-08	N.F. Carline, S.C. Linn, P.K. Yadav	Operating performance changes associated with corporate mergers and the role of corporate governance
04-07	J.J. Merrick, Jr., N.Y. Naik, P.K. Yadav	Strategic Trading Behaviour and Price Distortion in a Manipulated Market: Anatomy of a Squeeze
04-06	N.Y. Naik, P.K. Yadav	Trading Costs of Public Investors with Obligatory and Voluntary Market-Making: Evidence from Market Reforms
04-05	A. Kempf, S. Ruenzi	Family Matters: Rankings Within Fund Families and Fund Inflows
04-04	V. Agarwal, N.D. Daniel, N.Y. Naik	Role of Managerial Incentives and Discretion in Hedge Fund Performance
04-03	V. Agarwal, W.H. Fung, J.C. Loon, N.Y. Naik	Risk and Return in Convertible Arbitrage: Evidence from the Convertible Bond Market
04-02	A. Kempf, S. Ruenzi	Tournaments in Mutual Fund Families

04-01	I. Chowdhury, M. Hoffmann, A. Schabert	Inflation Dynamics and the Cost Channel of Monetary Transmission

centre for financial research
cfr/university of cologne
Albertus-Magnus-Platz
D-50923 cologne
fon +49(0)221-470-6995
fax +49(0)221-470-3992
kempf@cfr-cologne.de
www.cfr-cologne.de