Size, Value, and Momentum in Developed Country Equity Returns: Macroeconomic and Liquidity Exposures*

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Comments welcome.

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Abstract

The paper investigates value and momentum factors in 23 developed international stock markets. We find that typically value and momentum premia are smaller and more negatively correlated for large market capitalization stocks relative to small. Momentum factors are more highly correlated internationally relative to value. We provide international evidence on three sets of risk exposures of value and momentum returns: macroeconomic risk, funding liquidity risk, and stock market liquidity risk. We find that value returns are typically lower prior to a recession while momentum returns often exhibit little sensitivity. Value returns are typically lower in times of poor funding liquidity, whereas, with notable exceptions, momentum returns are typically unaffected. Lastly, for almost all countries, value returns are high in poor stock market liquidity conditions. The same result appears to be true for momentum in Asia Pacific, North America, and largely in Europe.

Keywords: developed international equity markets, value effect, momentum effect, macroeconomic risk, liquidity risk

JEL Codes: G14, G15

1. Introduction

Value and momentum effects documented in the finance literature continue to challenge asset pricing theory. In the United States, among many other important papers, DeBondt and Thaler (1985), Fama and French (1992, 1996), and Lakonishok, Shleifer, and Vishny (1994) provide evidence for the value effect: Stocks with high ratios of fundamentals (such as book value or cash flows) to price tend to have higher average returns relative to stocks with low ratios. Pioneering work by Jegadeesh and Titman (1993, 2001) provides evidence for the momentum effect: Stocks with high cumulative returns over the past year continue to perform better. This paper contributes to the value and momentum investing literatures by exploring momentum and value factor returns in 23 developed international stock markets.

There is a sizeable body of research on value and momentum in international stock markets as researchers have strived to extend the analysis and evidence found for the United States to the international arena. Asness, Moskowitz, and Pedersen (2013), Chui, Wei, and Titman (2000, 2012), Fama and French (1998, 2012), Griffin (2002), Griffin, Ji, and Martin (2003), Hou, Karolyi, and Kho (2010), and Rouwenhorst (1998, 1999) all document value and momentum effects in international stock markets. Our paper contributes to the existing literature by working with country-level data rather than regional data, focusing on the size patterns in value and momentum returns, and exploring the macroeconomic and liquidity loadings of value and momentum returns.

Working with firm-level monthly return data from January 1990 to March 2012, we have five sets of results. Each set addresses a specific economic question. First, we provide country-level evidence of the size patterns in value and momentum returns. The economic

interest here is to understand whether investors can earn the same value and momentum returns if they restrict their analysis to large capitalization (big) stocks, which typically have lower transaction costs relative to small capitalization (small) stocks. We find that for almost all countries, value and momentum effects are smaller for big stocks. In the United States, Korajczyk and Sadka (2004) and Lesmond, Schill, and Zhou (2004) question if returns can survive the high portfolio turnover implied by momentum. Our analysis shows that potentially the same concern exists for the international stock markets studied in this paper: Big stocks come with lower transaction costs and lower momentum (and value) premia. Our finding corroborates the results of Fama and French (2012), who work with the same set of countries and provide results for four regions: North America, Europe, Japan, and Asia Pacific.

Second, we report the correlations between value and momentum factors in the same country. The economic question is whether investors in a given country can earn significant diversification benefits by combining value and momentum strategies. We find that value and momentum factors are negatively correlated in any given country. We also find that correlations are more negative and significant for the value and momentum factors constructed using big stocks relative to small stocks. This finding is important since even though big stocks have smaller value and momentum premia, in addition to trading with lower transaction costs, the diversification benefits of combining them is larger.

Third, we correlate the value factor in one country with the momentum factor in another. These correlations are useful for quantifying diversification benefits of international value and momentum strategies. The economic issue here is whether investors could pursue value and

momentum returns in different countries, and, yet still enjoy portfolio diversification. We find that a majority of intercountry correlations between value and momentum factors are statistically significant and negative. Because the majority of the papers in the literature focuses either on the value or the momentum effect; surprisingly, the correlations are not widely reported, particularly for international data. One exception is Asness, Moskowitz, and Pedersen (2013), who find corroborating evidence for value and momentum factors calculated for the United States, the U.K, Continental Europe, and Japan regions without making a distinction between small or big stocks. Griffin (2002) reports correlations between value factors in the United States, Japan, the U.K, and Canada. Recent work by Cakici, Fabozzi, and Tan (2012) examine correlations for three regions of emerging markets: Asia, Latin America, and Eastern Europe.

Fourth, we explore if country value and momentum returns generate significant and positive abnormal returns with respect to the Capital Asset Pricing model (CAPM). We use four different CAPMs estimated relative to the same-country, global, or U.S. benchmark market returns. The alpha values are economically important since they represent how attractive the country value and momentum returns are to various local, U.S., or global investors. Our alpha results indicate that the value and momentum effects consistently survive the risk adjustment using various measures of the market return. In particular, in Asia Pacific, Japan, and North America, country value factors have more significant and positive alphas relative to momentum. In Europe, on the other hand, country momentum factors have more significant and positive alphas relative to value. For Europe and Asia Pacific, momentum betas are usually negative and significant, whereas value betas are insignificant; for North

America it is the other way around: value betas are usually negative and significant, whereas momentum betas are insignificant. The magnitudes of significant betas in all cases are small, and almost always are between 0 and -0.5.

Lastly, we explore the macroeconomic and liquidity risk loadings of country value and momentum returns. Our macroeconomic analysis describes how future gross domestic product (GDP) or consumption growth is related to current value and momentum returns. This analysis is important for investors concerned about their portfolios performing poorly just prior to a recession. We use the global future GDP or consumption growth rates to measure future macroeconomic conditions. We find that while value returns almost always load positively on future GDP or consumption growth, momentum loadings are almost always insignificant. The implication is that value returns can be low prior to periods of low global economic growth. Recent papers by Bansal and Yaron (2004), Bansal, Kiku, and Yaron (2012), Hansen, Heaton, and Li (2008), and Kiku (2006) emphasize the role of long run covariances of returns with consumption growth in explaining the value premia in the United States. Our results suggest that the same economic mechanism can be potentially useful in explaining international value premia but probably not momentum premia.

Turning to the liquidity risk loadings, we focus on two sets of liquidity variables: funding liquidity and stock market liquidity. The liquidity analysis tackles the contemporaneous relation between value and momentum returns and funding liquidity or stock market liquidity conditions. Following Brunnermeier and Pedersen (2009), we think of funding liquidity as the ease with which traders can obtain funding. Following a large, systematic (market-wide) liquidity literature (Amihud, 2002, Chordia, Roll, and Subrahmanyam, 2000, Huberman

and Halka, 2001, Pástor and Stambaugh, 2003), we define stock market liquidity as the relative ease of transacting in the stock market. Funding liquidity correlations are a concern for hedge funds or in-house desks directly or indirectly subject to bank financing. Our benchmark variable for funding liquidity is the U.S. TED spread: the difference between the LIBOR rate and the rate on the short-term U.S. government debt. Stock market liquidity correlations are important for investors concerned about having to face low returns exactly when trading to unwind would incur large transaction costs. We use the variables introduced in Pastor and Stambaugh (2003) and Sadka (2006) to measure stock market liquidity. Almost all country value returns have negative and statistically significant (or otherwise insignificant) loadings on the U.S. TED spread. One explanation for this finding can be as follows. If due to the value effect (high expected returns) the market is long value stocks a lot more than growth stocks through leverage, one would expect the value stocks to perform worse than growth stocks in times of high TED spreads. This is because high TED spreads are typically associated with episodes of deleveraging and risk-reduction. This channel is consistent with the margin/funding liquidity spiral mechanisms explored by Brunnermeier and Pedersen (2009). Momentum returns, on the other hand, almost always have insignificant (or otherwise positive and statistically significant) loadings (with the notable exceptions of Hong Kong and Singapore). The implication is that value returns can be lower when funding liquidity is poor, whereas momentum returns can, in some cases, be good hedges against funding liquidity deteriorations. Our results on macroeconomic and funding liquidity risk loadings help to explain why momentum and value can be negatively correlated in different countries. If liquidity and macroeconomic risk factors have a global common component, risk loadings

of opposite signs can generate the negative correlation patterns observed in the data.

Turning to stock market liquidity risk exposures, we find that for most countries, value and momentum returns have significant and positive (or otherwise insignificant) loadings on stock market liquidity variables (with a few exceptions for momentum factors coming primarily from smaller countries in Europe). The implication is that both value and momentum do well in times of poor stock market liquidity. The stock market liquidity variables are calculated using U.S. stock market data, meaning that this finding is most relevant to U.S.-based investors. However, a recent study by Brockman, Chung, and Pérignon (2012) finds that part of the average liquidity within a given country's stock exchange is driven by a global component, common to all exchanges. Moreover, the common global component of liquidity, which drives individual exchange liquidity around the world, is larger following U.S. macroeconomic announcements. Therefore, our results can be informative for the loadings of country value and momentum factors on same-country stock market liquidity measures as well.[1]

Recent work by Asness, Moskowitz, and Pedersen (2013) also considers the macroeconomic and liquidity exposures of international value and momentum returns. In particular, they group all equities from four regions– the United States, the U.K., Continental Europe, and Japan– and report regional macroeconomic exposures. We extend their results by providing corroborating country-level evidence; moreover, we provide additional evidence from Australia, Hong Kong, New Zealand, Singapore, and Canada. They consider the liquidity exposures of an aggregate value factor as well as an aggregate momentum factor. Both

[1] Among several other notable papers, Chordia, Roll, and Subrahmanyam (2000) find that average liquidity in an exchange serves as a common component that affects individual firm-level liquidities in the same exchange.

aggregate factors are formed by further combining all equities from the four regions with additional value and momentum returns calculated from other asset classes like commodities, currencies, and sovereign debt. Our analysis focuses on country-level equity factors.

The paper is organized as follows. Section 2 describes the data and methodology we employ to form the value and momentum portfolios. Section 3 presents the results, and Section 4 presents our robustness exercises. Section 5 concludes the paper.

2. Data and Methodology

In this section, we describe the data we use in the paper. We start with equity data, followed by GDP and consumption data. Next we describe our liquidity and credit risk variables. The final subsection explains the formation of the value and momentum factors calculated using international firm-level stock return data.

2.1. Equity Data

Our stock data for all 23 developed countries are monthly and are available from Datastream. The sample period is January 1990 to March 2012. One year of data is lost in forming the momentum factors; therefore, our value and momentum returns start from January 1991. All returns are in U.S. dollars, and any excess returns are calculated relative to the 1-month U.S. T-bill. We choose to work with individual countries rather than grouping countries into regions.[2] Table 1 illustrates information about the coverage of our data. The table reports

[2]In contrast to some recent studies, we use country-level rather than regional data. For example, Fama and French (2012) and Cakici, Fabozzi, and Tan (2012) group countries into regions because they focus on asset pricing tests, which require a large number of portfolios to be used as right-hand-side variables in the regressions. Forming a large number of sorted portfolios becomes an issue for individual countries with relatively small numbers of stocks. Since our focus is not on asset pricing tests but on establishing the magnitudes of momentum and size effects and documenting

the mean (across the months) of the median firm size (in millions of dollars) and the book equity to market equity ratio (B/M) in our Datastream sample. The table also shows the mean number of firms (across the months) in our sample. Focusing on the G7 countries, on average, we have 712 firms in France, 648 in Germany, 1557 in the U.K., 3028 in Japan, 918 in Canada, and 3330 in the United States. The total across the 23 countries is 14,525 firms. These numbers suggest that our data set has comprehensive coverage in the developed economies of the world. The average size across countries ranges from $51.57 million dollars in Greece, to $322.06 million dollars in the U.S.. The range for the book equity to market equity ratio (B/M) is tighter across the countries: from 0.57 for Germany to 1.04 for Hong Kong.

2.2. GDP and Consumption Data

For all 23 countries, the annual GDP and consumption data are available from the World Bank website. We use Final Consumption Expenditure data for consumption. Both consumption and GDP data are nominal and in U.S. dollars. GDP data are available until 2011, consumption data are available until 2010. Ideally, we would perform our macroeconomic risk regressions using quarterly or monthly data, but the World Bank only reports monthly or quarterly international data. In a robustness exercise, we use quarterly data for the United States. Specifically, we employ the quarterly GDP and consumption data from the National Income and Product Accounts (NIPA) Table 1.1.5 available from the Bureau of Economic Analysis, (BEA). Both series are nominal and seasonally adjusted. We use Personal Consumption Expenditures as our quarterly consumption variable.

the liquidity and macroeconomic exposures, using country-level rather than regional data is more appropriate.

2.3. Liquidity and Credit Risk Data

We have two sets of liquidity variables: funding liquidity and stock market liquidity. Our funding liquidity variables are the VIX, the LIBOR rate, the U.S. TED spread, the equal weighted average of a measure of G7 TED spreads, and finally the average interbank rate for the G7 countries. The VIX data is available from the Chicago Board of Options Exchange (CBOE) at a daily frequency. We average the daily values to obtain quarterly or annual values. Data are available until March 2012, the end date of our stock return sample. The LIBOR rate is the 3-Month London Interbank Offered Rate based on the U.S. Dollar. The U.S. TED spread is the difference between the LIBOR rate and the 3-Month U.S. Treasury Constant Maturity Rate, available at a monthly frequency from the FRED database of the Federal Reserve Bank of St. Louis. To proxy a TED spread measure for the banks in the G7 countries, we difference the local currency interbank rate and the local currency deposit rate. Both rates are available at a monthly frequency from Datastream. Turning to the liquidity variables calculated using stock market data, our data source is the Center for Research in Security Prices (CRSP) available from the Wharton Research Data Services (WRDS). In particular, Transitory and Permanent components of the liquidity variable introduced in Sadka (2006) as well as the Level, Innovations and the Traded Liquidity factors used by Pastor and Stambaugh (2003) are available at a monthly frequency until December 2010. In addition, we use two credit risk variables– the Aaa (Moody's Seasoned Aaa Corporate Bond Yield) minus the 10-year constant maturity U.S. Treasury rate, and the Baa (Moody's Seasoned Baa Corporate Bond Yield) minus the 10-year constant maturity U.S. Treasury rate– both of which available at a monthly frequency from the FRED database. Data are

available until March 2012, the end date of our portfolio return sample. Annual and quarterly versions of liquidity and credit risk variables are calculated by averaging monthly values.

2.4. Calculation of Asset Pricing Factors

We calculate the following four asset pricing factors for each of the 23 developed countries: the market factor, the SMB (small minus big) factor, the HML (high minus low) factor, and the momentum (WML) factor. The HML and WML factors require us to double-sort on size and the ratio of book equity to market equity (B/M) as well as on size and momentum. Following the literature, we always use the 6-month lagged value of the B/M ratio to make sure that the accounting information is available to the investor at the time of the portfolio sort.[3] We form our portfolios monthly. For all countries, the market factor is simply the value-weighted average of all stock returns in the country.

We closely follow Fama and French (2012) when calculating the SMB, HML, and WML factors. For each country, we form six portfolios to calculate the SMB and HML factors. We first classify as big stocks the largest market capitalization stocks which constitute 90% of the country's total market capitalization. All remaining stocks in the country are classified as small stocks. Then, for the big stocks of the country, we determine the usual bottom 30% (growth), middle 40% (neutral), and top 30% (value) breakpoints for the B/M ratio and apply these B/M breakpoints to both the big and small stocks. These classifications allow us to form six value-weighted portfolios– SG, SN, SV, BG, BN, and BV– where S and B indicate small or big, and G, N, and V indicate growth, neutral, and value respectively.

[3]Similarly, a few papers have examined modifications to the sorting procedure introduced in Fama and French (1992) which has been widely used in the literature. Asness and Frazzini (2012) perform annual sorts yet lag only the book equity value (by six months) and use the current market equity to calculate the B/M ratio.

The size factor, SMB, is the equal-weighted average of the returns on the three small stock portfolios (Small) minus the average of the returns on the three big stock portfolios (Big). We construct value minus growth returns for small and big stocks, $\text{HML}_S = \text{SV} - \text{SG}$ and $\text{HML}_B = \text{BV} - \text{BG}$, with HML being the equal-weighted average of HML_S and HML_B.

The calculation of the WML factor is identical to the calculation of the HML factor except that the second sort is made not on the stock's B/M ratio but on last year's return (excluding one month's return just prior to the sort date). For portfolios formed at the end of month t, the last years return (lagged momentum) is a stock's cumulative return from $t-11$ to $t-1$. The last month, t, is omitted as is common practice in the momentum literature. The intersection of the independent size and lagged momentum sorts results in six value-weighted portfolios– SL, SN, SW, BL, BN, and BW– where S and B indicate small or big, and L, N, and W indicate losers, neutral, and winners (bottom 30%, middle 40%, and top 30% of lagged momentum), respectively. We form winner minus loser returns of small and big stocks, $\text{WML}_S = \text{SW} - \text{SL}$ and $\text{WML}_B = \text{BW} - \text{BL}$ with WML being the equal-weighted average of WML_S and WML_B. The B/M ratio or momentum breakpoints come from the country's big stock universe to prevent the sorts from being, driven by the characteristics of many tiny stocks. Figure 1 plots the market, HML and WML factors for the G-7 countries.

2.5. Macroeconomic and Liquidity Risk Exposure Regressions

We measure the macroeconomic risk exposure of risk exposure of each country's value and momentum factors using regressions of the factor returns on the contemporaneous market

return and future GDP growth. Specifically, we estimate the following:

$$(1) \qquad R_{i,t+1} = a_i + b_i \left[R^m_{i,t+1} - R_f\right] + c_i \left[GDP_{i,t+3}/GDP_{i,t+1} - 1\right] + e_{i,t+1},$$

where $R_{i,t+1}$ is the value or momentum factor return of country i during the year $t+1$; $R^m_{i,t+1}$ is the market factor return of country i during the year $t+1$; and $GDP_{i,t+1}$ represents the GDP of country i during the year $t+1$. R_f is the U.S. risk-free rate. We also run regressions of each country's value and momentum factors on the market returns and GDP growth associated with the U.S. and the global economy including all 23 developed countries.

To measure the liquidity and credit risk exposures, we estimate the following regression:

$$(2) \quad R_{i,t+1} = a_i + b_i \left[R^m_{U.S.,t+1} - R_f\right] + c_i \left[GDP_{U.S.,t+3}/GDP_{U.S.,t+1} - 1\right] + d_i LIQ_{j,t+1} + e_{i,t+1},$$

where $LIQ_{j,t+1}$ is the j^{th} liquidity or credit risk variable during the year $t+1$. In the regressions we use five funding liquidity variables, five stock market liquidity variables, and two credit risk variables, as described in Section 2.3. In the robustness section, we check our results using consumption growth rather than GDP growth; we also explore a quarterly version of the regression using U.S. market return and GDP growth (or consumption growth).

3. Results

3.1. Market, Size, Value, and Momentum

Table 1 presents the means and the t-statistics of the excess market return, Market- R_f, as well as the Small (S) and Big (B) and SMB portfolios which is the difference between S and B. Throughout the paper, we use the Newey and West (1987) procedure for our standard errors. With the exception of Japan, all market risk premia (Market - R_f means) are positive against the U.S. T-bill rate; however, as is usual, the estimates are very imprecise. In fact, excess market returns are distinguishable from zero for only four countries: Switzerland, Hong Kong, Canada, and the United States.[4]

We find that no size premia in any country during our sample period: Size premia point estimates (SMB means) are never statistically significantly positive. In fact, size premia point estimates are negative in 10 out of 16 European countries, three of the four Asia Pacific countries as well as in Japan.[5] In the Asia Pacific region, Hong Kong, New Zealand, and Singapore have negative size premia point estimates. For Australia, the sign is positive but statistically insignificant. In Canada and the United States, the point estimates are positive but again statistically insignificant. These findings are consistent with Fama and French (2012) who report insignificant size premia by grouping same countries into four regions: North America, Asia Pacific, Japan, and Europe.

Table 2 provides the means and the t-statistics of the value factor (HML) for all countries, in addition to the value factors calculated for small and big stocks, HML_S, and HML_B. The

[4]Throughout the paper, we use 5% as our statistical significance level and print significant values in bold.

[5]Three of the 10 European negative point estimates, three are statistically significant: Denmark, Italy, and Portugal. In these countries, big stocks have statistically larger average returns than small stocks.

table also reports the difference variable, HML_{S-B}, which allows us to formally compare the small and the big stock value premia as well as the annualized Sharpe ratio of HMLs. The value premia point estimates (HML means) are positive in all countries and highly statistically significant in most. In fact, nine out of 16 European countries, all Asia Pacific countries and Japan, and Canada have statistically significant positive value premia. We also explore whether the value premia are larger for small stocks or for big stocks. To answer this we look at the means and t-statistics of HML_{S-B}. In all countries except Spain and the Netherlands, small stock value premia point estimates are larger than the big stock value premia. In six of the 23 countries, HML_{S-B} is positive and statistically significant (Denmark, Finland, France, Italy, Hong Kong, and the United States). Our finding of larger value premia for small stocks shows that the regional results provided in Fama and French (2012) are robust at the country level.[6]

Table 3 presents the same set of results for the momentum factor, WML. To formally compare the average momentum returns of small stocks to the momentum returns of big stocks, we report the means and the t-statistics of the difference variable, WML_{S-B}. t-statistics for WML means indicate that, nine out of 16 European countries exhibit statistically significant momentum premia.[7] In the Asia Pacific region and Japan; Australia and New Zealand's WMLs are statistically significant, but Hong Kong, Japan, and Singapore's are not. In fact the WML factor mean for Japan is barely above zero– a tiny 0.03% per month. Turning to North America, we find that the Canadian momentum factor is positive and statistically

[6]For the United States other papers finding larger value premia for small stocks include Fama and French (1993), Kothari, Shanken, and Sloan (1993), and Loughran (1997).

[7]If the significance level is reduced to 10% from 5%, 15 of the 16 European countries exhibit positive momentum premia.

significant but the U.S.'s is not (with a t-statistic of 1.47).

Next, we focus on the momentum factor calculated for small stocks (WML_S) and big stocks (WML_B). An overwhelming majority of European countries exhibit small stock momentum premia but not big stock momentum premia. In fact, 13 out of 16 (three out of 16) countries exhibit statistically significant small (big) stock momentum premia. In Asia Pacific, Australia and New Zealand exhibit small stock momentum premia, while only Australia exhibits big stock momentum premia. Hong Kong, Japan, and Singapore do not exhibit either small or big stock momentum premia. Focusing on the difference variable WML_{S-B}, we find that the results follow intuitively from the separate results for small and big stocks. In four of the 16 European countries (Austria, Belgium, Germany, the U.K.), small stock momentum premia are significantly higher than big stock momentum premia (statistically significant WML_{S-B} means). Australia and New Zealand also have statistically significantly higher small stock momentum premia. In North America, Canada has significantly larger small stock momentum premium relative to big stock premium, whereas in the United States the two premia are indistinguishable from zero. Fama and French (2012) report positive and statistically significant WML_{S-B} means for the regions of Asia Pacific and Europe. Our results compliment their results by suggesting that Australia and New Zealand in the Asia Pacific region or Austria, Belgium, Germany, and the U.K. in Europe may be driving the results for the regions.

3.2. Factor Correlations

We are interested in the correlations between the factors within the same country. These correlations are important for investors pursuing a menu of market, value, and momentum strategies within the same country. In each country, we correlate the small stock value and momentum factors (HML_S and WML_S), the big stock value and momentum factors (HML_B and WML_B), and finally the value and momentum factors (HML and WML). The intracountry correlation results are reported in Table 4.

We start with the correlations between WML and HML in each country reported in Panel A of Table 4. In all countries, the correlation point estimates are negative: Value does well when momentum does badly and vice versa. In Europe, 10 out of 16 correlations are statistically significant. In all Asia Pacific region countries, the correlations are statistically significant except in Japan. In North America, the U.S. correlation is significant, but Canada's is not. The negative correlations suggest that investors can combine value and momentum strategies in their country portfolios to improve the risk return trade-off, a point made by Asness, Moskowitz, and Pedersen (2013) for the regions of Continental Europe, the U.K., the United States, and Japan. Our results add country-level detail in Europe, as well as providing new evidence from Australia, Hong Kong, New Zealand, Singapore, and Canada. At a simple level, the implication of combining value and momentum strategies for investors would be to remove stocks that became value stocks because of low momentum from the long positions in high B/M stocks and to remove stocks with high momentum from the short position in low B/M stocks.[8]

[8]To explore if the value and momentum effects as well as the intercountry negative correlations between value and momentum are robust to excluding the Internet bubble, we rerun Tables 3 and 4 and recalculate correlations. From

We also ask how similar the correlations between small stock value and momentum returns (HML_S and WML_S) are to the correlations between the big stock value and momentum returns (HML_B and WML_B). This question is relevant for an investor attracted to the generally higher small stock value and momentum premia. Such an investor would naturally be concerned about whether the same diversification benefits documented for the overall markets, with small and big stocks together, are available when the investment universe includes only small stocks. In Europe, we find that the statistically significant and negative correlations between value and momentum factors are largely driven by the more negative and significant correlations exhibited by the big stock factors relative to the small stock factors. In fact, while 12 of the 16 European countries exhibit significant negative correlations between HML_B and WML_B, only three of 16 correlations between HML_S and WML_S are significant. A similar observation can be made for Asia Pacific. The implication for investors is that smaller big stock value and momentum premia can be offset by lower transaction costs and more negative correlations relative to the small stocks. In the United States and Japan, on the other hand, correlations do not appear to be sensitive to whether one is working with small stocks or big stocks.

Table 4 also reports the means, t-statistics, and Sharpe ratios of a combination strategy invested 50% in value and 50% momentum. Due to the negative correlations, combination portfolio volatilities are lower. In fact, all t-statistics are significant and the Sharpe ratios are significantly higher than those of value or momentum strategies alone (compare the last column of Table 4 with Tables 2 and 3).

our calculations, we omit the period inclusive of January 1998 to February 2000, the Internet bubble period used in Ofek and Richarson (2003). Results available from the authors indicate that our results are robust.

One component of the negative correlations between the size and value factors is purely mechanically driven: if a stock has been doing well over the last year, it is probably included in a long position in the momentum portfolio and in a short position in the value portfolio (since the B/M ratio is now lower). To explore if the negative correlations reported in Table 4 for the same country value and momentum factors are to a large extent mechanical, we correlate the momentum factor in country A and value factor in country B, where A and B can be any of the 23 developed countries. Table 5 reports the correlations; the t-statistics are unreported but correlations significant at the 5% level are printed in bold. The diagonal values of Table 5, the same-country correlations, are the same as the HML and WML correlations reported in Table 4. A vast majority of the correlations reported (496 out of 529) are negative, and more than 20% (101 out of 496) are significant. These results show that investors can obtain diversification benefits even when they pursue value and momentum strategies in different countries, rather than in the same country. The intercountry negative correlations are an intriguing result, and we conjecture that global liquidity and recession factors can help explain these correlations. We explore this idea further in Section 3.4.

Table 6 adds to the results in Table 5 by conditioning the correlations on up and down markets. We define the up (down) market as a month in which the U.S. market return is positive (negative). The table shows that value and momentum are negatively correlated, more so in up markets than in down markets, and more so for large capitalization stocks relative to small. These correlation results complement findings in previous studies (see, for example, Erb, Harvey, and Viskanta, 1994, Ang and Chen, 2002, and Longin and Solnik, 2002).

Next, we turn to the correlations between value (or momentum) factors calculated in two different countries. Correlations of the factor returns between any two countries are interesting especially for portfolios with a value or momentum style but in multiple countries. Table 7 reports correlations for the value factor. Within-region (Europe, Asia Pacific and Japan, and North America) as well as across-region correlations are almost always positive and usually statistically significant (71% of all pairwise correlations are significant, and only one is negative). The average correlations between two different country value factors, across the significant (all) coefficients is 0.29 (0.24). The average correlation across the significant European, Asia Pacific and Japan, and North America are 0.29, 0.26, and 0.69, respectively. Table 8 reports the correlations of the momentum factors across different countries. The coefficients are almost always positive and statistically significant. In fact close to 85% of all coefficients are significant, and all are positive. The average correlation is 0.42 across the significant correlations, and 0.39 across all correlations. The average correlation across the significant correlations in the European, Asia Pacific and Japan, and North America are 0.48, 0.32, and 0.74, respectively. Comparing the results in Table 7 and Table 8, momentum returns are more highly positively correlated across two countries relative to the value returns. The implication is that international diversification is more easily achieved for value than for momentum.

3.3. CAPM Alphas and Betas

While the value and momentum premia reported in Tables 2 and 3 can be impressively large, it is instructive to explore whether the strategies have positive risk-adjusted returns.

For this purpose, in Tables 9 and 10, we report the alphas and betas (and the t-statistics) of country value and momentum returns relative to four different CAPM specifications, respectively. The first specification is the Country CAPM, and uses the country's own market return (calculated in this paper) as the explanatory return. The second specification is a Regional CAPM, with the explanatory return being the return across the region to which the country belongs– either Europe, Asia Pacific ex Japan, Japan, or North America. The regions are Europe, Asia Pacific ex Japan, Japan, and North America. The third and fourth specifications are the Global and U.S. CAPMs, for which the explanatory returns are the global developed market return and U.S. market return. The market return series used in regional, global, and U.S. CAPMs are available from Kenneth French's website.[9]

For value factors, Table 9 reports that half of the 16 European and all five of the Asia Pacific countries and Japan, and both North American countries (the United States and Canada) have statistically significantly positive alphas. A total of 15 countries have positive Country CAPM alphas: Exactly the same number of countries with significantly positive HML returns in Table 2. Value returns seem to survive the country market risk adjustment, both in magnitude and in statistical significance. Regional, Global, or U.S. CAPMs do not change the picture relative to the Country CAPM. In particular, 14 out of 15 countries with significant positive Country CAPM alphas continue to have significant positive alphas in the Regional, Global, and U.S. CAPMs. Regression betas, unlike alphas, are often insignificant and quite small: Values range between -0.36 to 0.44 across the countries and CAPM specifications. Small and insignificant betas suggest that value returns exhibit market neutrality

[9]http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/. The authors are grateful to Kenneth French for making the data available via his website.

(or, in fact, negative correlations) with respect to global or local market returns.

Table 10 provides the alpha and beta results for the country momentum factors. The same four CAPM specifications used for the value factors in Table 9 are considered with respect to the Country, Regional, Global, and U.S. market returns to explain momentum returns. All European momentum returns have significantly positive alphas regardless of the explanatory market return considered, with the exception of Ireland.[10] Turning to the European momentum betas, all betas are negative regardless of the market return considered. More than half of the European countries have significantly negative momentum betas with respect to the European, Global, and U.S. market returns, and seven out of 16 countries have significantly negative betas with respect to Country CAPMs. These results show that European momentum strategies can be attractive to investors since alphas are large and significantly positive, and betas are negative and significant more than half the time. Turning to the Asia Pacific and Japan regions, only Australia and New Zealand have statistically significant and positive alphas, regardless of the benchmark market returns. Focusing on North America, Canada has significant and positive alphas but its betas are indistinguishable from zero for all models. The U.S. alphas are considered borderline significant, but the betas are indistinguishable from zero for all CAPMs used.[11]

[10] Ireland momentum return is significant with respect to the Country CAPM but not with respect to Regional, Global, or U.S. CAPMs.

[11] We find that the positive value and momentum alphas are robust to including all market returns (country, regional, global, or U.S.) jointly rather than one at time. Results are given in the last columns of Table 9 and 10.

3.4. Macroeconomic, Funding Liquidity, Credit Risk, and Market Liquidity Risk Loadings

In this section, we present the macroeconomic, funding liquidity, and stock market liquidity risk exposures of the country value and momentum factors.

3.4.1. Value

We report the value factor macroeconomic exposures in Table 11. We run regressions of annual value returns on future GDP growth and contemporaneous annual market returns. For each country, we run three sets of regressions: The first regression uses the global future GDP growth; the second regression uses the U.S. future GDP growth; and the third uses the country's own future GDP growth. Regressions always include a constant as well as either the Global, U.S., or same-country market return as a control variable. Annual GDP data are available from the World Bank website for all 23 countries up to and including 2011. Global GDP is the sum of all Country GDPs. Future GDP growth is a three-year GDP growth and is defined as $\text{GDP}_{t+3}/\text{GDP}_t - 1$, where t indexes the years. The global market return is available from Kenneth French's website; the second and third sets of regressions use U.S. and country market returns calculated in this paper.

Regression results given in Table 11 for value returns indicate that value loadings on future global GDP growth are almost always statistically significant and positive (or otherwise insignificant). In fact, 11 out of 16 European, three out of four Asia Pacific, and both North American value loadings on future global GDP growth are positive and statistically significant. The economic magnitudes appear large: the median coefficient (across those that are significant) is 1.01, and a 1% lower value return is associated with a 1% lower

cumulative GDP growth over the future three-year period. Japanese value factor does not have a statistically significant loading on global GDP growth.

Shifting the explanatory variables from global to the country level, the European and North American loadings do not change sign or become appreciably more or less significant: In fact, 11 of the 16 European value loadings are positive on country measures of future GDP growth.[12] When using country-level GDP growth rather than global growth, all GDP growth loadings for Asia Pacific value factors become insignificant. The implication is that for investors who care primarily about country-level GDP growth (potentially local investors), the Asia Pacific value strategies can be attractive despite their significant correlations with global GDP growth. Japan's value returns have insignificant loadings on country-level GDP growth. The United States and Canada have significant and positive country-level GDP growth loadings (0.83 and 0.62, respectively), which are lower than (Canada) or comparable to (U.S.) their loadings on global GDP growth.

Lastly, focusing on the regressions with U.S. GDP growth and market return as the explanatory variables, only four of the 16 European loadings on the GDP growth rates are significant and positive, which contrasts with this region's mostly significant and positive loadings on either the global or country-level GDP growth rates. The implication is that investors who care primarily about U.S. GDP growth can still pursue European value opportunities without worrying about low investment returns preceeding recessions. For Asia Pacific and Japan, and for North America loadings on U.S. GDP growth are similar to the loadings on Global GDP growth: Australia, Hong Kong, Canada and the United States have

[12]However, the magnitudes of the loadings appear smaller relative to loadings on Global GDP growth: the median across the significant loadings are 1.13 and 0.50, for global and country-level GDP growth rates, respectively.

significant and positive loadings.

Table 12 reports the funding liquidity and credit risk exposures of country value factors. We use five funding liquidity variables and two credit risk variables in our regressions. The funding liquidity variables are the VIX, the U.S. TED spread, the LIBOR rate, the equal-weighted average of TED spreads (the difference between the interbank and deposit rates expressed in local currency) in G7 countries, and finally the equal-weighted average of G7 interbank rates. The credit risk variables are the Aaa minus the U.S. Treasury spread and the Baa minus the Aaa spread. We run seven sets of regressions for each country; the country value factor is regressed on one of the seven funding liquidity or credit risk variables at a time. Regressions also include the U.S. annual contemporaneous market return and U.S. future three-year GDP growth (as in Table 11), but the coefficients of these additional control variables are unreported. The data period is from 1991 to 2008, since value factor data are available from 1991 and we use three-year future GDP growth data (GDP data are available through 2011).

In Table 12, the variable that exhibits the largest fraction of significant loadings is the U.S. TED spread. All loadings are almost always negative and statistically significant (or otherwise insignificant). In fact, 10 of the 16 European coefficients are significant and negative,and the United States, Hong Kong, Singapore, and Japan have statistically significant and negative loadings. Negative loadings suggest that the value returns are lower when the TED spreads are wide, i.e., when bank funding liquidity is poor. This observation is certainly a concern for a value desk run within an in-house bank hedge fund: Returns are poor exactly when the bank's funding costs are higher. The median value (across the sig-

nificant coefficients) is -26.06, which indicates that when the U.S. TED spread is 0.1% (10 basis points) higher, the value returns are 2.6% lower.[13] In corroborating results, European value factors have negative and significant loadings on the G7 TED spread: seven of the 16 European countries have a significantly negative loading. This sensitivity can be a concern, particularly for an in-house hedge fund run within a European bank sensitive to the TED spread measure for the G7. The magnitude of the exposure is large. The median European loading (across the significant ones) is -85.05 which implies that if the G7 TED goes up by one standard deviation (17 basis points), the value returns would go down by 14.6%. The European interbank rate and the U.S. LIBOR rate loadings are often significant and negative, but certainly not as often as the TED spread variables. This result suggests that it is the spread between the interbank rates and a measure of the risk-free rate rather than the interbank rates alone that is important for contemporaneous value returns.

The value portfolio is the sum of long and short components. We explore which component is likely responsible for the negative TED loadings. To examine this issue, we run the same regressions separately for the long and short components. The loadings and the t-statistics are given in the last four columns of Table 12. These findings are consistent with the margin/funding liquidity spiral channels explored by Brunnermeier and Pedersen (2009). Specifically, low funding liquidity can trigger risk-management-driven sell-offs, leading higher returns to short positions and lower returns to the long positions. Results are also affected by short position capital requirements relative to maintaining a levered long position (see, for example, Duffie, Garleanu, and Pedersen, 2002).

[13] One standard deviation of the annual U.S. TED is 32 basis points; therefore, the impact of a one standard deviation TED shock is about 8.23% on the value return.

VIX is a widely used variable for measuring stock market volatility and is thought of as a funding liquidity variable because as recent work by Adrian and Shin (2009) shows, broker-dealer banks have procyclical leverage cycles; moreover, changes in collateralized borrowing and lending on the intermediaries' balance sheet forecast the VIX. VIX can also be considered a proxy for stock market liquidity. We find that almost all country value factors have insignificant VIX loadings. Next, we turn to the credit risk variables– the Aaa minus the U.S. Treasury, and the Baa minus the Aaa spreads. A value investor with existing holdings of Aaa- or Baa-rated fixed income assets is naturally concerned about the loadings of value returns on investment grade credit spreads. The value exposures to credit risk appear insignificant. This result seemingly contradicts to the finding in the literature that the value effect can be at least partially explained by the distress risk, leading one to expect negative loadings on the credit spreads.[14] However, whether value returns exhibit distress risk and how distress risk is priced are highly controversial issues. For example, Campbell, Hilscher, and Szilagyi (2008) show that distressed firms, in turn, yield low subsequent returns. More recently, de Groot and Huij (2011) question whether value premium is related to the default risk at all. Moreover, the spreads considered in this paper need not be good measures of credit risk. Elton et al. (2000) show that expected default accounts for a surprisingly small fraction of the premium in corporate rates over treasuries. Lastly, our credit spreads are investment grade spreads rather than non-investment grade and therefore may not capture credit risk to a sufficient degree.

[14]For example, Avramov et al. (2012a) measure distress risk through credit downgrades and argue that value strategies are profitable because they take long positions in high credit risk firms subject to distress risk. In corroborating work, papers by Haugen (1995) and Vassalou and Xing (2004) argue that value effect and distress risk are related.

In Table 13, we explore how country value returns are related to the contemporaneous stock market liquidity measures. The stock market liquidity variables are the transitory and permanent components of the liquidity variable introduced in Sadka (2006), and the Level, Innovation, and Traded liquidity variables introduced in Pastor and Stambaugh (2003). For each country, we run the annual value return on a total of five annual stock market liquidity measures one at time, and we report the coefficients and t-statistics. Regressions also include the U.S. annual contemporaneous market return and the U.S. future three-year GDP growth. The coefficients of these additional control variables are not reported but are available upon request. Overall Table 13 shows that coefficients are mostly positive and often significant, implying that value returns are higher during times of poor stock market liquidity: Value returns can be a hedge for stock market liquidity deteriorations. Therefore, it appears that the value puzzle documented in the finance literature is only exacerbated when considering value return covariances with the liquidity factors examined in the table.[15]

3.4.2. Momentum

In this section, we explore the macroeconomic and liquidity risk exposures of the country-level momentum factors. In Table 14, we report the macroeconomic exposures of the momentum factors. We run three regressions for each country. In the first set, the global GDP growth and global market return are the explanatory variables. In the second (third) regression,

[15]Our macroeconomic exposure results corroborate and extend the findings reported in recent work by Asness, Moskowitz and Pedersen (2013). Whereas we measure country-level exposures, their study groups all equities in the U.S., Continental Europe, Japan, and U.K. regions together. They also study the exposure of an aggregate value factor to the funding liquidity and stock market liquidity variables considered in this paper. The aggregate value factor is formed by further grouping all equities in the four regions together with other value returns constructed from asset classes like commodities, currencies, and sovereign debt. They report that the aggregate value factor often has negative exposures to the funding and stock market liquidity variables studied in this paper.

U.S. GDP growth and U.S. market return (country GDP growth and country market return) are used as the explanatory variables. GDP growth is the three-year future GDP growth. Broadly, the table shows that very few of the GDP growth coefficients are significant. This result suggests that momentum returns are statistically unrelated to the GDP growth variables we use. The few significant coefficients are negative and in Europe (with one exception): Momentum returns are higher when future GDP growth is lower. Thus, momentum strategies are actually good hedges against low future economic growth.[16]

In Table 15, we explore how country momentum returns load on the funding liquidity variables and the credit risk variables. The U.S. TED spread seems to matter most. Three European countries have positive and statistically significant exposures, along with Japan (where there is no momentum). In comparison Hong Kong and Singapore have statistically significant negative exposures, implying that European momentum strategies in some cases do better and are good hedges against poor funding liquidity conditions measured by the U.S. TED spreads. On the other hand, we find that Hong Kong and Singapore momentum strategies do badly when funding liquidity is poor. The United States and Canada have insignificant loadings on the U.S. TED spreads. Results are similar for the G7 TED spread measure. The last four columns of Table 15 detail how the long and short sides of the momentum strategies respond to TED spreads. The results are similar to the case for value: the long side of the trades load negatively, and the short sides load positively.

We find that macroeconomic and funding liquidity risk factors can help us understand why momentum and value can be negatively correlated across different countries. A plausible

[16]The only statistically significant and positive momentum loading is the New Zealand momentum factor loading significantly positively on U.S. GDP growth.

explanation is that there are global common factors that drive country-level recession and funding liquidity. Our empirical results in Tables 11, 12, 14, and 15 indicate that value and momentum often load in opposite signs with respect to either factor. This correlation structure can drive negatively correlated intercountry value and momentum returns.

Momentum loadings are indistinguishable from zero for VIX, LIBOR, and the G7 interbank rate. Turning to the credit risk variables, momentum loadings are significantly negative for two of the 23 countries for the Aaa minus U.S. Treasury spread; and significantly positive for three of the 23 countries for the Baa minus Aaa spread. While the economic interpretations of the two credit spread variables can be different, the implication is that the momentum exposure to credit risk seems at best sporadic across the countries and ambiguous in sign. Recent work by Abramov et al. (2012b) shows that most of the momentum profits are generated using firms with low credit ratings. This finding leads us to expect negative loadings on the spread variables we use. The same issues raised about the spread variables in the previous section can help reconcile the generally insignificant loadings we find in this paper.

In Table 16, we explore how sensitive the country momentum returns are to the stock market liquidity variables introduced in Sadka (2006) and Pastor and Stambaugh (2003). We find that North American and Asia Pacific momentum factor loadings on stock market liquidity variables are mostly indistinguishable from zero or otherwise positive and statistically significant. In particular, Canada and Singapore exhibit positive loadings on the Sadka transitory liquidity variable and Hong Kong and Singapore have positive loadings on the Sadka permanent liquidity variable. Canada also exhibits a significant positive loading on

the Pastor and Stambaugh Innovation liquidity variable. It appears that the momentum puzzle for Asia Pacific countries, Canada and the United States is exacerbated by the stock market liquidity considerations. These positive loadings mean that momentum returns are high when stock market liquidity is poor. Turning to Europe, three larger economies have significant and positive loadings, whereas six smaller economies have significant and negative loadings. The negative loadings imply that covariation with the Sadka (2006) or Pastor and Stambaugh (2003) liquidity factors can help explain the high European momentum premia.[17]

4. Robustness

In this section, we present a sketch of our robustness exercises. Tables associated with our robustness exercises are available from the authors on request. Our first robustness exercise is about the January effect: Several studies have highlighted extraordinarily high value returns and extraordinarily low momentum returns in January (for value, see, for example, Loughran, 1997; for momentum, see, for example, Jegadeesh and Titman, 1993, Grundy and Martin, 2001, and Grinblatt and Moskowitz, 2004). Table 1A and Table 2A, report the same set of results as Tables 2 and 3 for value and momentum returns, respectively, but omit January data. Across the 23 countries, we see that while the results are often slightly weaker, the value and momentum effects survive the deletion of January mostly intact.

[17] Asness, Moskowitz, and Pedersen (2013) consider a group equities from the United States, Continental Europe, Japan, and the U.K. jointly and report that a global equities-based momentum factor has a negative and statistically significant macroeconomic exposure by considering a group equities from the U.S., Continental Europe, Japan, and U.K. together. We find a similar result for our country momentum factors. Asness, Moskowitz, and Pedersen (2013) also report liquidity loadings on an aggregate momentum factor, further grouping all equities in the four regions together with other momentum returns constructed from asset classes like commodities, currencies, and sovereign debt. They report that the aggregate momentum factor often has positive exposures to the funding and stock market liquidity variables studied in this paper.

In our main analysis we calculate our asset pricing factors using data from Datastream. A natural concern is how close our factors are to the Fama and French factors available from Kenneth French's website. At a country level, the website provides book-to-market factors data, which are calculated using raw data from Morgan Stanley Capital International for 1975 to 2006 and from Bloomberg for 2007 to 2011. At a regional level, Fama and French (2012) make available the momentum and book-to-market factors for the global developed economies– Japan, Europe, Asia Pacific not including Japan, and North American– using raw data from Bloomberg, supplemented by Datastream and Worldscope data. We perform our B/M ratio portfolio sorts on a monthly basis rather than annually, but we still use the ratio value from six months before to ensure that the ratio information is available at the date of portfolio formation. We base our comparisons on the value and momentum factors in the United States and Japan. Our factors are very highly correlated with the Fama and French factors, with very close means, variances, and correlations (same-country correlations across the factors, and across-country correlations of the same factor). The comparisons suggest that our results are robust to using factors constructed using our data source rather than the Fama and French factors.

In Tables 11 to 13 (Tables 14 to 16), we explore the loadings of value (momentum) returns on macroeconomic risk, funding liquidity and credit risk, and stock market liquidity risk, respectively. Tables 4A to 6A (7A to 9A), repeat the same analysis, replacing U.S. GDP growth with U.S. consumption growth (Final Consumption Expenditures, nominal in U.S. dollars and available from the World Bank website up to 2010) for value (momentum) factors. Comparing the results across, we see that the direction and significance of the results are

almost always preserved when we use consumption growth rather than GDP growth as the measure of macroeconomic risk.

In the main analysis when we explore value and momentum exposures to macroeconomic risk, funding liquidity and credit risk, and stock market liquidity risk, we use annual data because international GDP and consumption data are not available at shorter intervals. Focusing on U.S. GDP and consumption growth, we check if our results are robust to using quarterly data. Specifically, Tables 10A to 12A (13A to 15A) explore robustness for value (momentum) return exposures presented in Tables 11 to 13 (14 to 16), showing that exposures are qualitatively similar.

5. Conclusion

Empirical asset pricing literature consistently identifies value and momentum effects in developed equity markets around the world. This paper contributes to the literature by examining country-level data, exploring size patterns in value and momentum, and documenting international factor correlations. The paper also documents how value and momentum returns are related to macroeconomic, and liquidity risk factors. The results help us better understand the risk and return profile of value and momentum investments.

Big stock value and momentum premia appear to be smaller than small stock premia. Two reasons offset smaller premia in trading profits: Big stocks have smaller transaction costs, and big stock value and momentum factors are more negatively correlated relative to small stocks and therefore yield better diversification benefits. We find that the negative correlations between value and momentum factors in a given country are also observed in-

ternationally. The value factor in one country is negatively correlated with the momentum factor in another country. This result suggests that investors can combine value and momentum strategies internationally and continue to enjoy smaller overall portfolio volatility. An investor pursuing value or momentum strategies globally would find that momentum returns are more highly correlated across countries relative to value. Among other plausible conclusions, this result suggests that global investors might play a larger role in momentum relative to value.

We run regressions of value and momentum returns on future GDP or consumption growth. We find that while value returns are typically lower prior to a period of low economic growth, momentum returns exhibit little sensitivity. Among many other important papers, Bansal, Kiku, and Yaron (2012) and Hansen, Heaton, and Li (2008) suggest that long run consumption risk can be a factor in explaining value returns in the United States. The simple regressions run in this paper suggests that the same mechanism can be useful for understanding international value returns but presumably not momentum returns.

We also explore the covariances of value and momentum factors with funding liquidity and stock market liquidity variables. We think of funding liquidity as the bank cost of funds, and use the U.S. TED spread as a proxy. We define stock market liquidity as the cost of transacting in the stock market, and use the liquidity measures of Pastor and Stambaugh (2003) and Sadka (2006) as proxies. With a few notable exceptions, we find that value returns can be low during periods of poor funding liquidity, whereas momentum returns typically exhibit little sensitivity. In recent work, Brunnermeier and Pedersen (2009) emphasize a spiral effect whereby a funding liquidity shortage can result in asset price declines, only to

trigger more funding liquidity problems that, in turn, lead to further asset sales. The results in this paper suggest that equilibrium value expected returns can be high because value returns are more prone to a downward spiral. Turning to stock market liquidity, value and momentum returns are typically higher when the cost of transacting in the stock market is high.

It would be interesting to formally examine the optimal portfolio choices of various types of investors facing the menu of international value and momentum strategies documented in this paper. We leave the analysis of this important issue for future work.

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Table 1
Firm size, book equity to market equity ratio (B/M), number of firms, Market − R_f and size factors: Means and $t-$statistics.

				Market − R_f		Small (S)		Big (B)		SMB	
	Size	B/M	Number of Firms	mean (%)	t-stat.	mean (%)	t-stat.	mean (%)	t-stat.	mean (%)	t-stat.
Europe											
Austria AT	103.50	0.79	101.10	0.35	0.68	0.68	1.48	0.62	1.18	0.06	0.25
Belgium BE	148.81	0.79	140.10	0.54	1.24	**0.96**	2.32	0.80	1.86	0.16	1.02
Denmark DK	66.95	0.85	202.30	0.62	1.47	0.19	0.36	**1.00**	2.30	**-0.80**	-2.91
Finland FI	143.89	0.78	121.50	0.99	1.54	**1.25**	2.24	**1.21**	2.20	0.04	0.11
France FR	89.26	0.68	712.50	0.55	1.47	**0.85**	2.02	**0.88**	2.30	-0.03	-0.17
Germany DE	85.42	0.57	647.90	0.45	1.11	0.50	1.18	0.74	1.83	-0.24	-1.31
Greece GR	51.57	0.78	244.30	0.04	0.05	0.36	0.39	0.41	0.58	-0.05	-0.09
Ireland IE	282.24	0.61	52.60	0.79	1.64	0.73	1.21	**1.02**	2.00	-0.29	-0.82
Italy IT	212.72	0.84	298.80	0.33	0.72	0.35	0.70	0.68	1.41	-0.33	-1.96
Netherlands NL	315.17	0.64	160.60	0.56	1.41	0.91	1.85	0.78	1.96	0.13	0.65
Norway NO	109.68	0.74	172.90	0.81	1.54	1.13	1.81	**1.09**	1.98	0.04	0.18
Portugal PT	108.02	0.90	71.80	0.35	0.76	0.12	0.24	0.70	1.43	**-0.58**	-2.08
Spain ES	538.57	0.69	131.10	0.59	1.42	0.83	1.63	**0.88**	2.15	-0.05	-0.20
Sweden SE	86.23	0.62	325.30	0.91	1.69	**1.16**	2.01	**1.27**	2.52	-0.11	-0.60
Switzerland CH	231.47	0.75	266.00	**0.78**	2.36	0.78	1.77	**1.08**	3.03	-0.30	-1.32
United Kingdom U.K.	65.40	0.61	1557.00	0.50	1.40	0.85	1.75	**0.78**	2.19	0.07	0.33
Asia Pacific and Japan											
Australia AU	88.42	0.65	919.90	0.84	1.93	**1.21**	2.06	**1.15**	2.76	0.07	0.30
Hong Kong HK	125.97	1.04	689.00	**1.10**	2.16	0.79	1.25	**1.40**	2.69	-0.61	-1.79
Japan JP	196.87	0.91	3028.00	-0.05	-0.12	0.19	0.39	0.31	0.77	-0.12	-0.55
New Zealand NZ	79.15	0.76	86.40	0.84	1.95	**1.19**	2.63	**1.23**	2.88	-0.05	-0.24
Singapore SG	132.74	0.88	347.50	0.90	1.72	1.02	1.54	**1.27**	2.48	-0.25	-0.91
North America											
Canada CA	117.86	0.66	918.20	**0.79**	1.96	**1.17**	2.31	**1.06**	2.74	0.10	0.52
United States U.S.	322.06	0.56	3330.50	**0.65**	2.10	**1.19**	3.26	**0.91**	2.93	0.28	1.69

Notes.
The table reports the mean (across months) of the median firm size (in millions of dollars), and the book equity to market equity ratio (B/M) in our Datastream sample. The table also reports the mean number of firms (across the months) in our sample. In addition, the table reports the monthly means and t-statistics ($t-$stat) of the monthly returns of the Market − R_f, Small (S), Big (B), and the Small minus Big (SMB) asset pricing factors. $Market$ is the value weighted return of all stocks. $Small(S)$ is the return of a portfolio of small stocks (low market capitalization). $Big(B)$ is the return on a portfolio of big stocks (high market capitalization. SMB is the difference between the Small and Big returns. The factor construction procedure closely follows Fama and French (2012) and is described in Section 2.4 of the paper. All stock returns are converted into U.S. dollars. t-statistics are calculated using the Newey and West (1987) procedure allowing up to six months of autocorrelations. The first year of data is absorbed during the momentum sort; therefore, the data period is from January 1991 to March 2012.

Table 2
Value factors: Means, t-statistics, and Sharpe ratios.

	HML_S		HML_B		HML_{S-B}		HML		
	mean (%)	t-stat.	mean (%)	t-stat.	mean (%)	t-stat.	mean (%)	t-stat.	Sharpe Ratio
Europe									
Austria	0.79	1.96	**0.75**	2.10	0.04	0.09	**0.77**	2.44	0.59
Belgium	**0.63**	2.10	0.35	1.08	0.27	0.76	0.49	1.92	0.48
Denmark	**2.24**	5.14	0.46	1.00	**1.77**	3.20	**1.35**	3.81	1.05
Finland	**1.44**	2.59	-0.55	-0.73	**1.98**	2.69	0.44	0.81	0.22
France	**1.10**	3.12	0.25	0.75	**0.85**	2.73	**0.68**	2.20	0.62
Germany	**0.92**	2.53	**0.72**	2.25	0.19	0.65	**0.82**	2.66	0.76
Greece	**1.20**	2.59	0.57	1.11	0.63	0.98	**0.88**	2.39	0.59
Ireland	**2.33**	2.85	0.68	0.88	1.66	1.67	**1.51**	2.42	0.64
Italy	**0.95**	3.25	0.15	0.42	**0.80**	3.05	0.55	1.85	0.56
Netherlands	0.39	0.94	**0.58**	2.00	-0.19	-0.32	**0.49**	2.27	0.49
Norway	**1.28**	3.03	0.67	1.79	0.61	1.43	**0.97**	2.91	0.71
Portugal	0.81	1.78	-0.07	-0.17	0.89	1.73	0.37	1.01	0.24
Spain	0.19	0.59	0.39	1.42	-0.20	-0.55	0.29	1.22	0.27
Sweden	**0.97**	2.75	0.41	0.72	0.55	1.41	0.69	1.59	0.46
Switzerland	0.59	1.86	0.20	0.73	0.40	0.84	**0.40**	2.20	0.46
U.K.	0.63	1.72	0.10	0.40	0.53	1.76	0.36	1.34	0.41
Asia Pacific and Japan									
Australia	**0.96**	3.07	**0.59**	2.21	0.37	1.14	**0.77**	3.21	0.90
Hong Kong	**1.75**	4.88	0.02	0.05	**1.73**	4.25	**0.89**	2.77	0.68
Japan	**1.07**	4.89	**0.87**	3.00	0.21	0.99	**0.97**	4.13	1.11
New Zealand	**1.17**	2.68	0.48	1.29	0.69	1.50	**0.82**	2.46	0.58
Singapore	**1.08**	3.28	**0.89**	2.76	0.19	0.52	**0.99**	3.67	0.76
North America									
Canada	**1.06**	3.12	0.54	1.24	0.52	1.77	**0.80**	2.20	0.64
U.S.	0.59	1.94	0.14	0.65	**0.44**	2.02	0.37	1.51	0.39

Notes.
The table reports the monthly means, t-statistics ($t-$stat.), and Sharpe ratios (annualized) of the monthly returns of the High minus Low (HML) factor, as well as the HML factor calculated for small stocks (low market capitalization), HML_S, and large stocks (high market capitalization), HML_B. The HML factor captures the return differential between stocks with high (value stocks) and low (growth stocks) ratios of book equity to market equity and is the equal-weighted average of HML_S and HML_B. Also reported is the difference between HML_S and HML_B: HML_{S-B}. The factor construction procedure closely follows Fama and French (2012) and is described in Section 2.4 of the paper. All stock returns are converted into U.S. dollars. t-statistics are calculated using the Newey and West (1987) procedure allowing up to six months of autocorrelations. The data period is from January 1991 to March 2012.

Table 3
Momentum Factors: Means, t-statistics, and Sharpe Ratios.

	WML_S		WML_B		WML_{S-B}		WML		
	mean (%)	t-stat.	mean (%)	t-stat.	mean (%)	t-stat.	mean (%)	t-stat.	Sharpe Ratio
Europe									
Austria	**1.30**	2.77	0.33	0.69	**0.97**	2.42	0.82	1.90	0.49
Belgium	**1.41**	3.54	0.17	0.35	**1.24**	3.02	**0.79**	1.99	0.54
Denmark	**1.30**	3.98	**1.04**	2.70	0.26	0.73	**1.17**	3.80	0.90
Finland	0.57	1.26	**1.45**	2.36	-0.88	-1.39	**1.01**	2.32	0.52
France	**0.77**	2.12	0.44	1.35	0.33	1.25	0.61	1.90	0.42
Germany	**1.08**	3.22	0.36	0.91	**0.72**	3.09	**0.72**	2.07	0.48
Greece	**1.47**	3.20	0.99	1.78	0.48	0.93	**1.23**	2.79	0.60
Ireland	0.63	1.15	0.24	0.30	0.38	0.46	0.44	0.80	0.18
Italy	**1.10**	3.63	0.52	1.23	0.59	1.86	**0.81**	2.44	0.58
Netherlands	**0.92**	2.41	0.31	0.75	0.61	1.81	0.61	1.71	0.38
Norway	**1.02**	2.52	0.59	1.47	0.42	1.07	**0.80**	2.29	0.50
Portugal	0.59	1.25	0.91	1.94	-0.33	-0.60	**0.75**	1.96	0.41
Spain	**0.83**	2.06	0.50	1.28	0.33	0.95	0.66	1.86	0.44
Sweden	**0.98**	2.41	0.39	0.77	0.59	1.57	0.69	1.64	0.40
Switzerland	**0.93**	2.57	0.40	0.97	0.54	1.61	0.67	1.91	0.47
U.K.	**1.19**	3.67	**0.74**	2.02	**0.45**	2.03	**0.96**	2.94	0.71
Asia Pacific and Japan									
Australia	**1.77**	6.73	**0.59**	1.99	**1.18**	4.70	**1.18**	4.71	1.12
Hong Kong	0.32	0.78	0.39	0.82	-0.06	-0.16	0.36	0.90	0.22
Japan	-0.04	-0.14	0.10	0.26	-0.14	-0.60	0.03	0.09	0.02
New Zealand	**1.68**	4.69	0.62	1.61	**1.06**	2.40	**1.15**	3.84	0.88
Singapore	0.45	1.00	-0.04	-0.08	0.48	1.49	0.21	0.51	0.12
North America									
Canada	**1.72**	4.68	**0.98**	2.27	**0.74**	2.14	**1.35**	3.72	0.90
U.S.	0.58	1.57	0.46	1.26	0.12	0.59	0.52	1.47	0.34

Notes.
The table reports the monthly means, t-statistics ($t-$stat.), and Sharpe ratios (annualized) of the monthly returns of the Momentum (WML) factor, as well as the WML factor calculated for small stocks (low market capitalization), WML_S, and large stocks (high market capitalization), WML_B. The WML factor captures the return differential between stocks with high returns (winner stocks) in the previous year (from months $t-11$ to $t-1$, excluding the last month) and loser stocks with low returns in the same period. WML is the equal-weightws average of WML_S and WML_B. Also reported is the difference between WML_S and WML_B: WML_{S-B}. The factor construction procedure closely follows Fama and French (2012) and is described in Section 2.4 of the paper. All stock returns are converted into U.S. dollars. t-statistics are calculated using the Newey and West (1987) procedure allowing up to six months of autocorrelations. The data period is from January 1991 to March 2012.

Table 4
Intracountry correlations (and t-statistics) between value and momentum returns and combination strategy means, *t*-statistics, and Sharpe Ratios.

	Panel A: Intracountry Correlations								
	HML_S and WML_S		HML_B and WML_B		HML and WML		0.5×(HML + WML)		
	Corr.	t-stat	Corr.	t-stat	Corr.	t-stat	Mean	t-stat	Sharpe Ratio
				Europe					
Austria	-0.33	-1.67	**-0.31**	-2.44	**-0.43**	-2.44	**0.79**	5.05	0.98
Belgium	-0.24	-1.78	0.00	0.03	-0.14	-1.03	**0.64**	2.96	0.77
Denmark	0.11	0.95	**-0.38**	-3.24	**-0.27**	-2.50	**1.26**	6.94	1.62
Finland	-0.13	-1.15	0.03	0.16	-0.04	-0.30	**0.73**	2.55	0.53
France	-0.25	-0.80	**-0.50**	-4.42	-0.40	-1.93	**0.64**	3.92	0.91
Germany	-0.17	-1.20	**-0.38**	-2.69	**-0.33**	-2.11	**0.77**	4.60	1.00
Greece	**-0.26**	-3.07	**-0.36**	-2.01	**-0.37**	-2.55	**1.06**	4.06	1.03
Ireland	**-0.30**	-2.08	**-0.64**	-4.70	**-0.60**	-5.24	**0.97**	3.18	0.91
Italy	**-0.26**	-3.03	**-0.35**	-3.51	**-0.39**	-4.47	**0.68**	3.99	0.99
Netherlands	0.12	0.91	**-0.29**	-2.43	-0.08	-0.56	**0.55**	3.26	0.60
Norway	-0.18	-1.45	**-0.24**	-2.89	**-0.25**	-2.54	**0.89**	4.55	0.97
Portugal	-0.18	-1.75	**-0.35**	-2.59	**-0.28**	-2.35	**0.56**	2.55	0.55
Spain	0.00	0.02	-0.24	-1.47	-0.10	-0.57	**0.48**	2.50	0.55
Sweden	-0.14	-0.88	-0.30	-1.64	-0.25	-1.22	**0.69**	2.68	0.69
Switzerland	0.11	0.70	**-0.33**	-2.37	**-0.20**	-1.99	**0.53**	2.96	0.71
U.K.	-0.33	-1.53	**-0.50**	-6.03	**-0.51**	-3.88	**0.66**	4.04	1.12
				Asia Pacific and Japan					
Australia	**-0.29**	-2.90	-0.19	-1.73	**-0.26**	-2.44	**0.97**	6.01	1.66
Hong Kong	-0.18	-1.95	**-0.46**	-3.90	**-0.37**	-3.19	**0.62**	3.19	0.74
Japan	-0.15	-1.02	-0.30	-1.60	-0.27	-1.55	**0.50**	3.08	0.71
New Zealand	-0.07	-0.85	**-0.30**	-2.18	**-0.26**	-2.24	**0.99**	5.01	1.19
Singapore	**-0.31**	-2.37	**-0.40**	-2.51	**-0.48**	-3.96	**0.60**	3.00	0.77
				North America					
Canada	**-0.29**	-2.49	-0.20	-0.84	-0.25	-1.36	**1.08**	4.90	1.27
U.S.	-0.29	-1.30	**-0.35**	-3.15	**-0.36**	-1.99	**0.44**	2.94	0.60

	Panel B: Intracountry Average Correlations		
	All Months		
Europe	-0.15	-0.32	-0.29
Asia Pacific and Japan	-0.20	-0.33	-0.33
North America	-0.29	-0.27	-0.31
	Up Market		
Europe	-0.26	-0.39	-0.40
Asia Pacific and Japan	-0.24	-0.39	-0.38
North America	-0.37	-0.40	-0.42
	Down Market		
Europe	-0.01	-0.19	-0.12
Asia Pacific and Japan	-0.11	-0.22	-0.22
North America	-0.19	-0.13	-0.16

Notes.
Panel A presents the correlations and their *t*-statistics of the Value (HML) and Momentum (WML) factors calculated for the same country. Panel B presents average correlations in all markets, as well as conditioning on up (U.S. market return positive) and down markets (U.S. market return negative). Panel A also presents the means, *t*-statistics, and Sharpe ratios of the combination strategy, which is invested 50% in the Value and 50% in the Momentum factors. The HML factor captures the return differential between stocks with high (value stocks) and low (growth stocks) ratios of book equity to market equity. The WML factor captures the return differential between stocks with high returns (winner stocks) in the previous year (from months $t-11$ to $t-1$, excluding the last month) and loser stocks with low returns in the same period. The table reports the same information for Value and Momentum factors calculated for small stocks (HML_S, WML_S) and for big stocks (HML_B, WML_B). Small (Big) stocks have small (large) market capitalization. The factor construction procedure closely follows Fama and French (2012) and is described in Section 2.4 of the paper. All stock returns are converted into U.S. dollars. *t*-statistics are calculated using the Newey and West (1987) procedure allowing up to six months of autocorrelations. The data period is from January 1991 to March 2012.

Table 5
Correlations between the value factor in country A and momentum factor in Country B.

Correlations Between the Momentum Factor in Country A (row heading) and the Value Factor in Country B (column heading)																							
	Value Factor (Country B)																						
		Europe																Asia Pacific and Japan					North America	
		AT	BE	DK	FI	FR	DE	GR	IE	IT	NL	NO	PT	ES	SE	CH	UK	AU	HK	JP	NZ	SG	CA	U.S.
Momentum Factor (Country A)	Austria	**-0.43**	-0.11	-0.15	-0.07	-0.18	-0.16	**-0.17**	**-0.29**	**-0.21**	**-0.18**	-0.11	**-0.16**	-0.16	-0.11	-0.14	-0.19	**-0.14**	-0.09	0.01	0.00	-0.07	-0.03	-0.13
	Belgium	**-0.36**	-0.14	-0.20	**-0.17**	**-0.29**	**-0.32**	**-0.18**	**-0.28**	**-0.27**	-0.14	**-0.23**	-0.15	-0.14	**-0.16**	**-0.22**	**-0.30**	-0.09	**-0.18**	0.02	0.01	-0.10	-0.05	**-0.17**
	Denmark	-0.21	**-0.21**	**-0.27**	-0.10	**-0.25**	**-0.18**	**-0.13**	-0.24	**-0.21**	-0.17	**-0.21**	-0.08	-0.14	**-0.21**	**-0.22**	**-0.32**	-0.14	-0.10	0.01	-0.08	-0.15	-0.09	**-0.17**
	Finland	-0.10	-0.06	-0.03	-0.04	-0.19	-0.17	0.01	-0.07	**-0.18**	-0.08	-0.18	-0.02	0.02	-0.10	-0.08	**-0.30**	-0.04	-0.08	-0.06	0.04	-0.04	-0.06	-0.08
	France	-0.24	-0.16	-0.08	-0.05	-0.40	-0.30	-0.14	-0.16	**-0.24**	-0.06	-0.16	-0.04	-0.05	-0.16	-0.13	**-0.37**	-0.04	-0.19	-0.06	0.01	-0.07	-0.12	-0.17
	Germany	-0.25	-0.14	-0.02	-0.04	-0.31	**-0.33**	-0.12	-0.15	**-0.20**	-0.01	-0.14	-0.12	-0.01	-0.13	-0.09	**-0.35**	-0.06	-0.17	0.00	0.03	-0.09	-0.07	-0.18
	Greece	-0.15	**-0.24**	-0.09	-0.05	-0.15	-0.15	**-0.37**	-0.14	-0.06	-0.10	-0.11	-0.08	-0.03	-0.05	-0.13	-0.06	-0.03	-0.16	0.00	-0.05	-0.08	0.02	-0.13
	Ireland	-0.19	-0.14	-0.11	-0.08	-0.21	**-0.23**	-0.09	**-0.60**	-0.14	**-0.18**	-0.12	-0.13	-0.11	-0.10	**-0.20**	**-0.34**	-0.16	**-0.20**	-0.03	-0.08	**-0.25**	-0.08	**-0.25**
	Italy	-0.22	-0.09	-0.12	-0.07	**-0.39**	**-0.31**	-0.09	-0.17	**-0.39**	-0.05	-0.21	-0.11	-0.15	-0.19	**-0.16**	**-0.35**	-0.13	**-0.22**	-0.07	0.00	-0.10	-0.14	-0.15
	Netherlands	-0.18	-0.09	-0.04	-0.12	-0.33	-0.28	**-0.17**	-0.13	-0.12	-0.08	-0.16	-0.06	-0.07	-0.17	-0.08	**-0.37**	0.02	-0.18	-0.06	0.03	-0.12	-0.12	-0.15
	Norway	-0.10	0.04	-0.03	-0.04	-0.17	-0.15	-0.08	-0.14	**-0.16**	-0.03	**-0.25**	-0.10	0.08	-0.05	-0.06	**-0.20**	-0.09	-0.16	-0.06	-0.02	-0.10	-0.10	-0.08
	Portugal	-0.16	-0.04	-0.01	0.06	-0.14	-0.13	-0.09	-0.07	-0.18	-0.13	0.03	**-0.28**	-0.09	-0.01	-0.13	-0.12	-0.02	-0.07	0.04	0.00	-0.06	0.08	0.07
	Spain	-0.23	-0.11	-0.10	-0.11	**-0.34**	-0.27	-0.06	-0.20	**-0.20**	-0.07	-0.20	-0.13	-0.10	-0.11	**-0.20**	**-0.40**	-0.05	**-0.17**	-0.04	0.04	-0.02	-0.11	-0.17
	Sweden	-0.24	-0.08	-0.01	-0.07	-0.35	-0.24	-0.07	-0.09	-0.19	-0.01	-0.16	-0.02	-0.01	-0.25	-0.14	**-0.38**	0.01	-0.11	-0.06	0.02	-0.06	-0.06	-0.15
	Switzerland	-0.27	-0.11	-0.05	-0.09	-0.32	**-0.31**	-0.10	-0.20	**-0.25**	-0.12	-0.17	-0.12	-0.21	-0.16	**-0.20**	-0.32	-0.07	-0.16	0.00	0.02	-0.05	-0.16	-0.21
	U.K.	-0.18	-0.15	-0.20	-0.11	**-0.38**	**-0.33**	**-0.18**	-0.21	-0.15	-0.12	-0.21	-0.12	-0.08	-0.22	-0.13	**-0.51**	-0.15	-0.18	-0.14	-0.02	**-0.23**	-0.15	**-0.25**
	Australia	-0.05	-0.15	-0.18	-0.02	-0.20	**-0.15**	-0.05	-0.23	**-0.14**	-0.06	-0.14	-0.07	-0.11	-0.07	-0.11	**-0.33**	**-0.26**	-0.12	-0.14	-0.14	**-0.18**	-0.16	**-0.23**
	Hong Kong	-0.20	**-0.21**	-0.03	-0.04	-0.26	**-0.28**	-0.07	-0.17	**-0.20**	-0.05	-0.18	-0.07	-0.12	-0.11	-0.10	**-0.23**	-0.12	**-0.37**	-0.07	**-0.15**	**-0.30**	-0.13	-0.15
	Japan	-0.06	-0.01	-0.15	-0.13	-0.26	-0.18	0.05	-0.13	**-0.23**	-0.04	-0.11	0.03	-0.07	-0.17	-0.05	**-0.26**	-0.02	-0.17	-0.27	-0.06	-0.16	-0.16	-0.17
	New Zealand	-0.01	-0.09	-0.06	-0.10	-0.11	-0.09	-0.13	-0.04	-0.08	-0.09	-0.01	-0.01	-0.04	-0.17	-0.10	-0.12	-0.03	-0.12	-0.04	**-0.26**	-0.11	0.06	-0.08
	Singapore	-0.09	-0.11	-0.09	-0.03	-0.09	-0.11	-0.08	-0.11	-0.06	-0.05	-0.04	0.01	0.01	0.01	-0.10	-0.06	-0.10	-0.23	0.02	-0.13	**-0.48**	0.05	-0.01
	Canada	-0.18	-0.05	-0.07	-0.07	-0.29	-0.16	-0.12	-0.15	**-0.18**	-0.09	-0.12	-0.08	-0.13	-0.09	-0.05	**-0.38**	-0.16	-0.14	-0.14	-0.05	-0.12	-0.25	-0.21
	U.S.	-0.20	-0.09	-0.12	-0.15	**-0.44**	**-0.35**	-0.06	-0.17	**-0.20**	-0.08	-0.22	-0.05	-0.08	-0.22	-0.11	**-0.46**	-0.14	**-0.23**	-0.20	-0.04	**-0.23**	-0.27	**-0.36**

Notes.
The table provides the correlations between the Value (HML) factor in country "A" and the Momentum (WML) factor in country "B". The Momentum (Value) factors come from countries named as row (column) headings. Statistically significant correlation coefficients are typeset in bold (unreported t-statistic greater than 1.96 in absolute value). "A" and "B" can be any of the 23 countries considered in this study. HML factor captures the return differential between stocks with high (value stocks) and low (growth stocks) ratios of book equity to market equity. The WML factor captures the return differential between stocks with high returns (winner stocks) in the previous year (from months $t-11$ to $t-1$, excluding the last month) and loser stocks with low returns in the same period. Factor construction procedure closely follows Fama and French (2012) and is described in Section 2.4 of the paper. All stock returns are converted into U.S. dollars. t-statistics are calculated using the Newey and West (1987) procedure allowing up to six months of autocorrelations. The data period is from January 1991 to March 2012.

Table 6
Inter-country average correlations between value and momentum factors: Small and big stocks and during up and down markets.

Panel A: All Months			
	Europe	Asia Pacific and Japan	North America
All Stocks	-0.15	-0.12	-0.24
Small Stocks	-0.06	-0.04	-0.23
Big Stocks	-0.15	-0.11	-0.21
Panel B: Up Market			
	Europe	Asia Pacific and Japan	North America
All Stocks	-0.22	-0.14	-0.38
Small Stocks	-0.12	-0.06	-0.34
Big Stocks	-0.19	-0.14	-0.32
Panel C: Down Market			
	Europe	Asia Pacific and Japan	North America
All Stocks	-0.05	-0.10	-0.05
Small Stocks	0.02	-0.02	-0.06
Big Stocks	-0.08	-0.09	-0.05

Notes.
The table reports the average intercounty correlations between Value (HML) and Momentum (WML) factors for the countries in a region. For countries A and B in a region, we calculate the correlation between the value factor in country A and the momentum factor in country B, as well as the correlation between the momentum factor in country A and the value factor in country B. We make the same calculation for all possible pairs of countries in a region, and report the average of all correlations calculated for regions. The results are given for the entire stock universe (HML and WML), and for Small (HML_S and WML_S) and Big stocks (HML_B and WML_B) separately. The factor construction procedure closely follows Fama and French (2012) and is described in Section 2.4 of the paper. Regions and the associated countries are detailed in Section 2.1. of the paper. Panel A reports the correlations calculated using all months of data, whereas Panel B (C) reports correlations calculated using only the months where the U.S market return is positive, up market (negative, down market). The data period is January 1991 to March 2012.

Table 7
Correlations between the value factors across countries.

Correlations Between Value Factors Across Countries																							
	Europe																Asia Pacific and Japan					North America	
	AT	BE	DK	FI	FR	DE	GR	IE	IT	NL	NO	PT	ES	SE	CH	UK	AU	HK	JP	NZ	SG	CA	U.S.
Austria	1.00	0.13	0.10	0.12	0.27	0.23	0.08	0.25	**0.29**	0.16	**0.24**	0.15	0.24	0.12	0.19	0.26	0.09	0.06	0.02	0.01	0.06	0.03	0.18
Belgium		1.00	**0.23**	**0.18**	**0.30**	**0.33**	**0.21**	**0.19**	**0.25**	**0.31**	**0.19**	0.04	**0.18**	**0.24**	**0.29**	**0.33**	**0.16**	**0.18**	0.09	**0.18**	**0.24**	**0.19**	**0.35**
Denmark			1.00	**0.30**	**0.40**	**0.36**	**0.16**	**0.28**	**0.27**	**0.29**	**0.35**	**0.18**	**0.25**	**0.43**	0.14	**0.42**	**0.22**	**0.21**	**0.29**	0.13	**0.22**	**0.32**	**0.34**
Finland				1.00	**0.44**	**0.39**	0.02	**0.26**	**0.25**	**0.17**	**0.28**	0.02	**0.25**	**0.48**	**0.20**	**0.40**	**0.26**	**0.30**	**0.33**	**0.16**	**0.17**	**0.46**	**0.51**
France					1.00	**0.66**	**0.16**	**0.23**	**0.46**	**0.31**	**0.43**	**0.19**	**0.35**	**0.60**	**0.36**	**0.65**	**0.28**	**0.30**	**0.38**	0.11	**0.27**	**0.54**	**0.56**
Germany						1.00	**0.15**	**0.21**	**0.34**	**0.30**	**0.38**	**0.19**	**0.29**	**0.51**	**0.28**	**0.52**	**0.17**	**0.37**	**0.24**	**0.14**	**0.34**	**0.49**	**0.55**
Greece							1.00	0.07	0.08	0.16	0.05	**0.12**	0.00	0.11	**0.16**	0.14	**-0.12**	0.05	-0.03	0.12	0.00	-0.01	0.04
Ireland								1.00	**0.20**	**0.19**	**0.19**	0.05	0.19	**0.21**	**0.24**	**0.33**	**0.31**	**0.28**	0.07	0.03	**0.23**	**0.23**	**0.29**
Italy									1.00	0.18	**0.31**	**0.24**	**0.25**	**0.43**	**0.22**	**0.33**	**0.18**	**0.23**	0.15	**0.15**	0.11	**0.27**	**0.28**
Netherlands										1.00	**0.20**	**0.17**	**0.27**	**0.25**	**0.20**	**0.31**	**0.20**	0.14	**0.16**	0.03	0.15	**0.18**	**0.27**
Norway											1.00	**0.12**	0.17	**0.42**	**0.22**	**0.42**	**0.16**	**0.31**	**0.31**	0.08	**0.21**	**0.42**	**0.41**
Portugal												1.00	**0.26**	**0.21**	0.04	**0.17**	**0.14**	0.04	0.07	0.06	0.06	0.03	0.10
Spain													1.00	**0.34**	0.13	**0.33**	**0.15**	**0.21**	**0.12**	0.04	0.12	**0.24**	**0.27**
Sweden														1.00	**0.25**	**0.52**	**0.26**	**0.31**	**0.38**	**0.22**	0.20	**0.55**	**0.50**
Switzerland															1.00	**0.32**	**0.21**	0.11	**0.14**	0.04	**0.15**	**0.19**	**0.28**
U.K.																1.00	**0.31**	**0.30**	**0.40**	0.06	**0.26**	**0.51**	**0.60**
Australia																	1.00	0.12	**0.26**	**0.15**	0.13	**0.40**	**0.33**
Hong Kong																		1.00	0.18	0.12	**0.47**	**0.28**	**0.29**
Japan																			1.00	0.13	0.16	**0.48**	**0.42**
New Zealand																				1.00	**0.16**	0.07	**0.15**
Singapore																					1.00	**0.17**	**0.28**
Canada																						1.00	**0.69**
U.S.																							1.00

Notes.
The table provides the correlations between Value (HML) factors across countries. Statistically significant correlation coefficients are typeset in bold (unreported t-statistic greater than 1.96 in absolute value). The HML factor captures the return differential between stocks with high (value stocks) and low (growth stocks) ratios of book equity to market equity. The factor construction procedure closely follows Fama and French (2012) and is described in Section 2.4 of the paper. All stock returns are converted into U.S. dollars. t-statistics are calculated using the Newey and West (1987) procedure allowing up to six months of autocorrelations. The data period is from January 1991 to March 2012.

Table 8
Correlations between the momentum factors across countries.

Correlations Between Momentum Factors Across Countries																							
	Europe																Asia Pacific and Japan					North America	
	AT	BE	DK	FI	FR	DE	GR	IE	IT	NL	NO	PT	ES	SE	CH	UK	AU	HK	JP	NZ	SG	CA	U.S.
Austria	1.00	**0.57**	**0.38**	0.21	0.36	**0.42**	**0.35**	0.32	0.30	0.27	**0.24**	0.27	**0.38**	0.29	**0.36**	**0.37**	0.22	**0.25**	0.23	0.15	**0.29**	0.32	0.26
Belgium		1.00	**0.47**	**0.26**	**0.51**	**0.61**	**0.36**	**0.39**	**0.42**	**0.53**	**0.41**	**0.26**	**0.50**	**0.43**	**0.50**	**0.51**	**0.33**	**0.35**	0.22	**0.25**	**0.28**	**0.35**	**0.39**
Denmark			1.00	**0.38**	**0.48**	**0.42**	0.21	**0.39**	**0.37**	**0.47**	**0.39**	**0.28**	**0.42**	**0.48**	**0.48**	**0.52**	**0.44**	0.22	**0.31**	**0.25**	0.25	**0.44**	**0.46**
Finland				1.00	**0.46**	**0.45**	0.07	**0.29**	**0.46**	**0.40**	**0.38**	**0.22**	**0.45**	**0.50**	**0.38**	**0.47**	**0.33**	**0.21**	**0.30**	0.11	0.10	**0.36**	**0.45**
France					1.00	**0.78**	**0.30**	**0.40**	**0.72**	**0.75**	**0.56**	**0.42**	**0.69**	**0.73**	**0.73**	**0.75**	**0.39**	**0.46**	**0.41**	**0.23**	**0.24**	**0.63**	**0.72**
Germany						1.00	**0.30**	**0.37**	**0.61**	**0.70**	**0.49**	**0.38**	**0.65**	**0.68**	**0.63**	**0.70**	**0.34**	**0.48**	**0.33**	**0.20**	**0.30**	**0.53**	**0.64**
Greece							1.00	0.17	0.20	0.24	**0.25**	0.18	0.17	0.19	**0.29**	0.24	0.11	0.13	0.08	0.14	0.15	0.14	0.13
Ireland								1.00	**0.38**	**0.35**	**0.32**	0.18	**0.40**	**0.36**	**0.42**	**0.51**	**0.42**	**0.32**	**0.26**	**0.20**	0.22	**0.39**	**0.43**
Italy									1.00	**0.54**	**0.47**	**0.40**	**0.56**	**0.59**	**0.62**	**0.63**	**0.40**	**0.43**	**0.35**	0.13	0.18	**0.54**	**0.57**
Netherlands										1.00	**0.47**	**0.33**	**0.63**	**0.68**	**0.63**	**0.67**	**0.33**	**0.38**	**0.31**	**0.18**	**0.21**	**0.57**	**0.66**
Norway											1.00	**0.22**	**0.45**	**0.54**	**0.49**	**0.53**	**0.37**	**0.33**	**0.22**	**0.16**	**0.20**	**0.50**	**0.46**
Portugal												1.00	**0.36**	**0.33**	**0.33**	**0.35**	**0.21**	**0.18**	**0.20**	**0.15**	**0.20**	**0.30**	**0.31**
Spain													1.00	**0.65**	**0.62**	**0.64**	**0.35**	**0.36**	**0.32**	**0.20**	**0.21**	**0.55**	**0.58**
Sweden														1.00	**0.59**	**0.68**	**0.36**	**0.36**	**0.34**	**0.21**	**0.20**	**0.57**	**0.66**
Switzerland															1.00	**0.63**	**0.38**	**0.34**	**0.28**	0.16	0.17	**0.56**	**0.60**
U.K.																1.00	**0.57**	**0.47**	**0.39**	**0.26**	**0.35**	**0.69**	**0.77**
Australia																	1.00	**0.34**	**0.32**	**0.30**	**0.30**	**0.56**	**0.51**
Hong Kong																		1.00	**0.29**	0.13	**0.56**	**0.38**	**0.48**
Japan																			1.00	**0.27**	**0.27**	**0.33**	**0.48**
New Zealand																				1.00	**0.28**	**0.18**	**0.25**
Singapore																					1.00	**0.23**	**0.30**
Canada																						1.00	**0.74**
U.S.																							1.00

Notes.
The table provides the correlations between Momentum (WML) factors across countries. Statistically significant correlation coefficients are typeset in bold (unreported t-statistic greater than 1.96 in absolute value). The WML factor captures the return differential between stocks with high returns (winner stocks) in the previous year (from months, $t-11$ to $t-1$ excluding the last month) and loser stocks with low returns in the same period. The factor construction procedure closely follows Fama and French (2012) and is described in Section 2.4 of the paper. All stock returns are converted into U.S. dollars. t-statistics are calculated using the Newey and West (1987) procedure allowing up to six months of autocorrelations. the data period is from January of 1991 to March of 2012.

Table 9
Alphas and Betas (and the t-statistics) of country value factors with respect to country, regional, global, and U.S. CAPMs.

	Country CAPM				Regional CAPM				Global CAPM				U.S. CAPM				Altogether	
	α %	t-stat.	β	t-stat.	α %	t-stat.	β	t-stat.	α %	t-stat.	β	t-stat.	α %	t-stat.	β	t-stat.	α %	t-stat.
Europe																		
Austria	**0.74**	2.58	0.08	1.06	**0.69**	2.54	0.16	1.67	**0.69**	2.50	0.19	1.73	**0.66**	2.44	0.17	1.70	**0.67**	2.47
Belgium	0.50	1.87	-0.02	-0.23	0.48	1.74	0.02	0.30	0.48	1.78	0.01	0.16	0.51	1.85	-0.03	-0.43	**0.55**	2.05
Denmark	**1.34**	3.60	0.01	0.10	**1.36**	3.64	-0.03	-0.24	**1.38**	3.62	-0.06	-0.49	**1.42**	3.59	-0.12	-0.90	**1.44**	3.66
Finland	0.74	1.44	**-0.30**	-2.89	0.52	0.95	-0.15	-1.34	0.54	0.96	-0.21	-1.48	0.64	1.13	**-0.32**	-2.22	0.86	1.71
France	**0.67**	2.20	0.01	0.17	**0.66**	2.17	0.02	0.24	**0.68**	2.16	0.00	0.01	**0.69**	2.17	-0.03	-0.26	**0.7**	2.25
Germany	**0.81**	2.62	0.03	0.39	**0.79**	2.51	0.07	0.85	**0.80**	2.51	0.04	0.40	**0.83**	2.51	-0.01	-0.08	**0.82**	2.45
Greece	**0.88**	2.67	**0.15**	2.85	**0.82**	2.29	**0.13**	2.25	**0.83**	2.33	**0.13**	2.05	**0.84**	2.29	0.08	1.26	**0.97**	2.81
Ireland	**1.16**	2.06	**0.44**	3.04	**1.37**	2.25	0.25	1.26	**1.39**	2.26	0.28	1.18	**1.37**	2.18	0.23	0.98	**1.27**	2.30
Italy	0.49	1.83	**0.16**	3.21	0.49	1.73	0.10	1.81	0.51	1.73	0.09	1.46	0.52	1.74	0.04	0.63	**0.6**	2.20
Netherlands	**0.50**	2.33	-0.01	-0.21	**0.48**	2.23	0.02	0.22	**0.48**	2.22	0.01	0.20	**0.50**	2.29	-0.02	-0.22	**0.53**	2.43
Norway	**0.98**	2.95	0.00	-0.07	**0.99**	3.00	-0.04	-0.53	**0.99**	3.01	-0.05	-0.55	**1.06**	3.20	-0.15	-1.77	**1.14**	3.61
Portugal	0.32	0.90	0.16	1.86	0.31	0.83	0.12	1.14	0.32	0.88	0.11	0.90	0.34	0.91	0.05	0.43	0.39	1.07
Spain	0.30	1.27	-0.02	-0.24	0.30	1.28	-0.02	-0.24	0.30	1.28	-0.02	-0.23	0.32	1.34	-0.05	-0.46	0.34	1.41
Sweden	0.79	1.79	-0.11	-1.02	0.73	1.62	-0.07	-0.64	0.74	1.65	-0.13	-0.93	0.82	1.79	-0.21	-1.45	**0.91**	2.10
Switzerland	0.34	1.84	0.07	1.54	0.35	1.90	0.08	1.60	**0.37**	1.97	0.07	1.19	**0.37**	2.01	0.04	0.72	**0.39**	2.06
U.K.	0.31	1.15	0.10	1.72	0.33	1.25	0.05	0.87	0.34	1.26	0.05	0.66	0.35	1.29	0.01	0.19	0.36	1.38
Asia Pacific and Japan																		
Australia	**0.88**	3.67	**-0.13**	-2.80	**0.87**	3.70	**-0.11**	-2.84	**0.83**	3.53	**-0.13**	-1.99	**0.83**	3.45	-0.10	-1.56	**0.86**	3.55
Hong Kong	**0.72**	2.50	**0.15**	2.29	**0.72**	2.41	**0.20**	2.93	**0.84**	2.65	0.10	1.16	**0.85**	2.66	0.06	0.78	**0.75**	2.88
Japan	**0.96**	4.50	**-0.15**	-3.14	**0.96**	4.51	**-0.15**	-3.10	**1.06**	4.99	**-0.21**	-4.44	**1.10**	5.09	**-0.22**	-4.68	**1.07**	5.39
New Zealand	**0.82**	2.31	0.00	0.06	**0.79**	2.28	0.04	0.71	**0.83**	2.43	-0.01	-0.14	**0.85**	2.48	-0.05	-0.67	**0.86**	2.40
Singapore	**0.83**	3.23	0.18	1.91	**0.87**	3.30	0.15	1.50	**0.95**	3.55	0.09	0.71	**0.95**	3.49	0.05	0.44	**0.9**	3.48
North America																		
Canada	**1.04**	2.95	**-0.31**	-3.04	**1.02**	2.77	**-0.34**	-3.12	**0.94**	2.66	**-0.33**	-3.00	**1.02**	2.83	**-0.36**	-3.18	**0.94**	2.68
U.S.	**0.50**	1.97	**-0.20**	-2.09	**0.50**	1.98	**-0.21**	-2.23	0.44	1.77	-0.16	-1.64	**0.50**	2.01	**-0.22**	-2.26	**0.53**	2.11

Notes.
The paper presents the alphas and betas of country Value factors (HML) with respect to four CAPM specifications. Statistically significant alphas and betas are typeset in bold (t-statistic greater than 1.96 in absolute value). The HML factor captures the return differential between stocks with high (value stocks) and low (growth stocks) ratios of book equity to market equity. The factor construction procedure closely follows Fama and French (2012) and is described in Section 2.4 of the paper. In the Country CAPM, the explanatory market return is taken as the market return of the country calculated in this paper. In the Regional CAPM, the market return is the market return of the region (Europe, Asia Pasific, Japan, and North America) to which the country belongs. In the global CAPM, the market return is the Global market return for the developed countries in Fama and French (2012). In the U.S. CAPM, the market return is the market return of the United States.The market return series of the regional, global, and U.S. specifications are taken from Ken French's website. The last two columns report the alphas and the t-statistics when all local, regional, U.S. and global market returns are simultaneously used as explanatory variables. Excess market returns are calculated in excess of the U.S. T-bill rate. All stock returns are converted into U.S. dollars. t-statistics are calculated using the Newey and West (1987) procedure allowing up to six months of autocorrelations. The data period is from January 1991 to March 2012.

Table 10
Alphas and Betas (and the t-statistics) of country momentum factors with respect to country, regional, global, and U.S. CAPMs.

	Country CAPM				Regional CAPM				Global CAPM				U.S. CAPM				All together	
	α %	t-stat.	β	t-stat.	α %	t-stat.	β	t-stat.	α %	t-stat.	β	t-stat.	α %	t-stat.	β	t-stat.	α %	t-stat.
Europe																		
Austria	**0.88**	2.31	-0.18	-1.34	**0.92**	2.52	-0.21	-1.28	**0.93**	2.56	-0.25	-1.39	**0.97**	2.68	-0.25	-1.37	**0.94**	2.61
Belgium	**1.03**	3.33	**-0.43**	-4.31	**1.01**	3.14	**-0.42**	-3.68	**1.00**	3.09	**-0.47**	-3.51	**1.05**	3.17	**-0.42**	-3.10	**1.05**	3.47
Denmark	**1.27**	4.78	-0.17	-1.68	**1.28**	4.58	**-0.21**	-2.15	**1.27**	4.54	**-0.24**	-2.03	**1.30**	4.47	-0.22	-1.86	**1.3**	4.52
Finland	**1.15**	2.65	-0.15	-1.49	**1.07**	2.47	-0.13	-1.47	**1.09**	2.54	-0.19	-1.75	**1.11**	2.59	-0.16	-1.40	**1.11**	2.54
France	**0.75**	2.51	**-0.26**	-2.53	**0.75**	2.53	**-0.28**	-2.50	**0.77**	2.59	**-0.37**	-2.86	**0.82**	2.74	**-0.36**	-2.68	**0.79**	2.62
Germany	**0.85**	2.68	**-0.29**	-2.24	**0.90**	2.90	**-0.35**	-2.38	**0.90**	2.93	**-0.41**	-2.56	**0.96**	2.97	**-0.39**	-2.42	**0.9**	2.87
Greece	**1.24**	2.75	-0.18	-1.89	**1.41**	3.54	**-0.34**	-2.67	**1.38**	3.46	**-0.35**	-2.39	**1.42**	3.55	**-0.31**	-2.21	**1.36**	3.13
Ireland	**0.86**	2.06	**-0.54**	-3.67	0.72	1.61	**-0.55**	-2.82	0.71	1.61	**-0.63**	-2.74	0.79	1.80	**-0.58**	-2.50	**0.86**	1.99
Italy	**0.86**	2.71	-0.16	-1.86	**0.93**	2.88	**-0.23**	-2.19	**0.93**	2.89	**-0.29**	-2.43	**0.98**	3.02	**-0.27**	-2.26	**0.94**	2.81
Netherlands	**0.79**	2.27	**-0.30**	-2.94	**0.78**	2.25	**-0.33**	-2.75	**0.79**	2.29	**-0.41**	-3.24	**0.84**	2.39	**-0.37**	-2.85	**0.79**	2.26
Norway	**0.90**	2.72	-0.12	-1.65	**0.94**	2.79	**-0.26**	-2.62	**0.94**	2.88	**-0.32**	-2.83	**0.98**	2.87	**-0.29**	-2.51	**0.93**	2.62
Portugal	**0.85**	2.40	**-0.29**	-3.97	**0.94**	2.79	**-0.37**	-4.39	**0.92**	2.68	**-0.39**	-3.82	**0.96**	2.76	**-0.35**	-3.48	**0.95**	2.80
Spain	**0.75**	2.17	-0.14	-1.68	**0.75**	2.19	-0.17	-1.50	**0.77**	2.30	**-0.25**	-2.02	**0.81**	2.38	-0.24	-1.96	**0.77**	2.28
Sweden	**0.86**	2.11	-0.19	-1.66	**0.81**	1.97	-0.23	-1.77	**0.83**	2.04	**-0.32**	-2.22	**0.88**	2.12	**-0.32**	-2.01	**0.88**	2.14
Switzerland	**0.81**	2.30	-0.19	-1.43	**0.79**	2.39	-0.25	-1.96	**0.79**	2.39	**-0.29**	-1.97	**0.84**	2.48	-0.28	-1.91	**0.81**	2.17
U.K.	**1.08**	3.58	**-0.23**	-2.24	**1.07**	3.50	-0.20	-1.96	**1.07**	3.55	**-0.25**	-2.13	**1.10**	3.56	-0.23	-1.89	**1.09**	3.51
Asia Pacific and Japan																		
Australia	**1.17**	4.81	0.01	0.13	**1.18**	4.82	-0.01	-0.11	**1.18**	4.82	-0.01	-0.14	**1.19**	4.84	-0.03	-0.35	**1.19**	4.79
Hong Kong	0.55	1.42	-0.17	-1.79	0.55	1.42	**-0.23**	-2.27	0.46	1.17	**-0.24**	-2.05	0.49	1.23	**-0.21**	-1.99	0.54	1.36
Japan	0.02	0.06	-0.16	-1.72	0.02	0.06	-0.15	-1.70	0.10	0.31	-0.16	-1.61	0.09	0.28	-0.10	-1.00	0.02	0.05
New Zealand	**1.30**	4.40	**-0.19**	-2.93	**1.28**	4.54	**-0.15**	-2.63	**1.24**	4.35	**-0.22**	-3.02	**1.24**	4.28	**-0.16**	-2.16	**1.26**	4.36
Singapore	0.52	1.78	**-0.35**	-2.65	0.45	1.45	**-0.29**	-2.04	0.37	1.09	**-0.37**	-2.42	0.42	1.27	**-0.35**	-2.46	0.46	1.52
North America																		
Canada	**1.31**	3.71	0.05	0.45	**1.39**	3.82	-0.06	-0.48	**1.38**	3.82	-0.06	-0.44	**1.38**	3.80	-0.05	-0.34	**1.42**	4.03
U.S.	0.62	1.90	-0.16	-1.16	0.62	1.87	-0.17	-1.18	0.59	1.77	-0.16	-1.09	0.60	1.83	-0.14	-0.94	0.61	1.83

Notes.
The paper presents the alphas and betas of country Momentum factors (WML) with respect to four CAPM specifications. Statistically significant alphas and betas are typeset in bold (t-statistic greater than 1.96 in absolute value). WML factor captures the return differential between stocks with high returns (winner stocks) in the previous year (from months $t-11$ to $t-1$, excluding the last month) and loser stocks with low returns in the same period. The factor construction procedure closely follows Fama and French (2012) and is described in Section 2.4 of the paper. In the Country CAPM, the explanatory market return is taken as the market return of the country. In the Regional CAPM, the market return is the market return of the region (Europe, Asia Pasific, Japan, and North America) to which the country belongs. In the Global CAPM, the market return is the global market return for the developed countries in Fama and French (2012). In the U.S. CAPM, the market return is the market return of the United States. Market return series of the regional, global, and U.S. specifications are available from Ken French's website. The last two columns report the alphas and the t-statistics when all local, regional, U.S. and global market returns are simultaneously used as explanatory variables. Excess market returns are calculated in excess of the U.S. T-bill rate. All stock returns are converted into U.S. dollars. t-statistics are calculated using the Newey and West (1987) procedure allowing up to six months of autocorrelations. The data period is from January 1991 to March 2012.

Table 11
Value factor loadings on future GDP growth and the market return.

	Global Δ GDP and Global Market					U.S. Δ GDP and U.S. Market					Country Δ GDP and Country Market				
	Δ GDP	*t*-stat.	Market−R_f	*t*-stat.	R-square	Δ GDP	*t*-stat.	Market−R_f	*t*-stat.	R-square	Δ GDP	*t*-stat.	Market−R_f	*t*-stat.	R-square
Europe															
Austria	0.13	0.36	**0.25**	2.04	0.11	**1.21**	5.29	0.05	0.39	0.25	-0.16	-0.76	0.13	1.35	0.08
Belgium	**0.61**	2.45	-0.26	-1.89	0.31	0.55	0.95	**-0.44**	-2.97	0.28	**0.37**	3.68	**-0.25**	-2.29	0.47
Denmark	**2.06**	4.54	0.14	0.47	0.45	**2.42**	3.18	-0.48	-1.06	0.20	**1.03**	5.37	0.22	1.56	0.59
Finland	**2.64**	7.27	**-0.36**	-3.12	0.69	2.19	1.78	**-0.92**	-2.56	0.28	**0.86**	4.48	**-0.31**	-3.78	0.57
France	**1.17**	5.22	-0.05	-0.36	0.56	0.92	1.32	-0.23	-0.85	0.13	**0.54**	4.15	-0.02	-0.17	0.53
Germany	**0.87**	4.58	0.06	0.41	0.38	0.33	1.38	-0.12	-0.73	0.03	**0.43**	3.97	0.12	0.87	0.40
Greece	-0.54	-1.02	**0.62**	2.71	0.18	-1.32	-1.07	0.58	1.73	0.11	0.24	1.37	**0.44**	2.69	0.32
Ireland	**3.71**	4.08	0.17	0.37	0.59	**4.22**	2.66	-0.89	-1.12	0.26	**1.54**	7.75	-0.29	-1.47	0.79
Italy	**0.52**	2.37	0.23	1.58	0.17	1.02	1.85	-0.03	-0.16	0.14	**0.24**	3.28	**0.29**	3.66	0.39
Netherlands	**0.40**	2.07	-0.14	-1.28	0.14	-0.04	-0.08	**-0.24**	-2.13	0.13	**0.32**	3.00	-0.16	-1.69	0.33
Norway	**0.86**	2.39	0.12	0.46	0.16	0.45	0.79	-0.29	-1.89	0.07	**0.35**	2.34	0.12	0.75	0.23
Portugal	0.30	0.98	0.22	1.76	0.05	-0.16	-0.21	0.04	0.17	0.00	0.27	1.67	**0.22**	2.03	0.12
Spain	0.48	1.73	0.15	0.92	0.15	**0.70**	2.39	0.01	0.08	0.10	0.07	0.68	0.05	0.47	0.03
Sweden	**2.16**	5.49	-0.28	-1.21	0.61	2.00	1.60	-0.88	-1.94	0.34	**0.89**	4.08	-0.14	-1.28	0.57
Switzerland	0.20	0.97	-0.15	-1.35	0.16	0.19	0.73	-0.19	-1.93	0.13	0.15	1.59	0.03	0.23	0.07
U.K.	**1.13**	5.06	0.06	0.42	0.45	0.95	1.26	-0.30	-1.07	0.15	**0.50**	2.77	0.10	0.68	0.39
Asia Pacific and Japan															
Australia	**1.06**	3.05	-0.35	-1.67	0.46	**1.59**	2.71	-0.50	-1.60	0.28	0.19	1.04	-0.23	-1.08	0.14
Hong Kong	**1.26**	5.31	0.12	0.65	0.48	**1.13**	2.16	-0.27	-1.19	0.14	0.00	-0.02	0.09	0.59	0.05
Japan	0.35	1.47	**-0.60**	-2.22	0.37	-0.24	-0.63	**-0.64**	-2.23	0.41	-0.22	-0.69	-0.49	-1.89	0.39
New Zealand	0.25	0.61	-0.11	-0.53	0.03	-0.06	-0.15	-0.13	-0.49	0.02	0.17	1.28	-0.06	-0.44	0.08
Singapore	**0.63**	2.95	-0.19	-1.61	0.22	0.03	0.07	**-0.42**	-2.06	0.26	-0.10	-0.50	-0.01	-0.14	0.03
North America															
Canada	**0.96**	3.30	**-0.53**	-4.19	0.61	**1.32**	2.67	**-0.80**	-4.95	0.57	**0.62**	4.93	**-0.44**	-3.49	0.57
U.S.	**0.81**	4.08	**-0.23**	-2.30	0.53	**0.83**	1.97	**-0.44**	-3.10	0.36	**0.83**	1.97	**-0.44**	-3.10	0.36

Notes.
The table reports the regression coefficients of running annual country value (HML) factors on future GDP (nominal gross domestic product in U.S. dollars) growth and contemporaneous excess market return. Statistically significant coefficients are typeset in bold (*t*-statistic greater than 1.96 in absolute value). For each country, three sets of regressions are run. The first set uses global GDP growth and global excess market return. The second set uses U.S. GDP growth and U.S. excess market return (calculated in this paper). The third set uses the country's own GDP growth and country excess market return. GDP data for all countries are available from the World Bank website up to 2011. Future GDP growth (Δ) at year t, is the three-year GDP growth; therefore is defined as $\text{GDP}_{t+3}/\text{GD}P_t - 1$. The HML factor captures the return differential between stocks with high (value stocks) and low (growth stocks) ratios of book equity to market equity. The factor construction procedure closely follows Fama and French (2012) and is described in Section 2.4 of the paper. *Global market return* is the market return factor calculated for developed economies and is available from Ken French's website. Excess market returns are calculated in excess of the U.S. T-bill rate. All stock returns are converted into U.S. dollars. *t*-statistics are calculated using the Newey and West (1987) procedure allowing up to 3 years of autocorrelations. The data period is from 1991 to 2008.

Table 12 Funding Liquidity and Credit Risk Exposure of Country Value Factors.

	VIX		U.S. TED		U.S. LIBOR		G7 TED		G7 Libor		AAA -Treasury		BAA-AAA		U.S. TED (long)		U.S. TED (short)	
	coef.	*t*-stat.	coef.	*t*-stat.	coef.	*t*-stat.	coef.	*t*-stat.	coef.	*t*-stat.	coef.	*t*-stat.	coef.	*t*-stat.	coef.	*t*-stat.	coef.	*t*-stat.
Europe																		
Austria	1.03	1.63	5.74	0.47	0.80	0.54	24.48	0.95	-1.96	-1.20	15.62	1.75	-11.14	-1.61	**-64.96**	-4.71	**78.07**	10.46
Belgium	-0.12	-0.33	-2.83	-0.31	-1.03	-0.47	0.08	0.01	-0.13	-0.14	**14.38**	3.24	-4.45	-0.40	**-38.55**	-4.56	**42.42**	4.09
Denmark	0.27	0.21	**-54.45**	-4.45	-2.39	-0.40	**-85.05**	-2.79	**-4.43**	-2.33	**36.75**	2.11	-15.32	-0.33	**-79.78**	-5.58	**41.65**	4.18
Finland	-0.46	-0.28	**-60.23**	-3.73	**-7.98**	-2.84	**-85.75**	-2.61	0.29	0.06	33.40	1.47	33.18	1.21	**-77.56**	-3.24	31.59	1.31
France	-0.01	-0.01	**-30.53**	-3.35	-1.42	-0.99	-47.84	-1.79	-0.78	-0.63	10.14	0.78	-6.66	-0.41	**-49.29**	-6.50	**31.55**	3.22
Germany	0.44	0.62	-13.88	-1.72	-2.77	-1.38	-14.69	-1.01	-1.43	-0.93	20.48	1.86	11.42	0.68	**-35.59**	-3.10	**22.30**	2.95
Greece	1.38	0.87	-3.56	-0.19	0.46	0.15	6.91	0.17	-5.73	-1.90	39.86	1.19	-13.50	-0.61	73.70	0.87	-4.45	-0.15
Ireland	0.25	0.13	**-98.09**	-4.24	-3.20	-0.73	**-180.53**	-3.69	**-5.15**	-1.99	54.08	1.64	-40.27	-0.87	**-75.20**	-7.14	-0.55	-0.03
Italy	-1.00	-1.71	**-20.12**	-2.09	-0.69	-0.58	-25.89	-1.22	-1.02	-0.77	-11.96	-1.23	**-26.86**	-2.13	-31.44	-1.57	24.58	1.68
Netherlands	-0.04	-0.09	-9.99	-1.42	0.63	0.24	-20.28	-1.70	-0.50	-0.53	**12.66**	2.73	-2.29	-0.17	**-41.16**	-5.70	**42.68**	4.78
Norway	-0.78	-1.02	**-23.33**	-2.16	**-4.77**	-3.41	-17.69	-1.32	-2.20	-1.72	11.99	1.14	-5.95	-0.40	**-91.72**	-3.68	**108.03**	7.37
Portugal	-0.89	-0.98	**-23.13**	-2.81	0.70	0.31	**-51.93**	-2.03	0.07	0.06	-22.74	-1.09	-10.60	-0.43	**-56.60**	-4.36	**50.34**	4.69
Spain	**-1.08**	-2.29	**-16.48**	-2.14	-0.41	-0.20	**-39.11**	-2.26	1.00	0.71	-11.28	-1.08	2.44	0.17	**-47.41**	-3.35	**39.11**	2.76
Sweden	-0.36	-0.31	**-53.33**	-4.28	-3.66	-1.60	**-88.99**	-3.83	-1.27	-0.47	13.72	0.85	14.31	0.52	**-71.25**	-4.66	**37.33**	3.74
Switzerland	-0.11	-0.20	-3.41	-0.40	1.20	0.93	-3.65	-0.17	0.26	0.32	-9.52	-1.49	-12.38	-1.69	**-29.97**	-2.38	**25.94**	3.38
U.K.	-1.17	-1.92	**-45.20**	-7.93	**-3.12**	-2.28	**-61.44**	-3.42	-1.98	-1.82	3.38	0.35	-20.45	-1.26	**-54.89**	-5.30	**35.00**	5.94
Asia Pacific and Japan																		
Australia	0.15	0.20	-20.62	-1.69	2.91	1.30	-49.68	-1.73	1.60	0.93	2.84	0.22	-5.22	-0.23	**-65.84**	-4.96	**67.74**	4.41
Hong Kong	-0.33	-0.41	**-28.81**	-3.12	**-4.92**	-1.97	-35.92	-1.83	-2.46	-1.30	21.00	1.45	5.21	0.26	**-76.00**	-2.06	**43.64**	2.57
Japan	-0.33	-0.48	**-19.28**	-2.08	2.23	0.57	-37.59	-1.59	0.34	0.24	2.20	0.17	-16.61	-0.69	-19.95	-0.88	4.20	0.15
New Zealand	-0.63	-0.63	-8.09	-0.44	0.82	0.21	-44.62	-1.24	2.40	0.98	-6.08	-0.34	10.15	0.41	**-72.25**	-3.05	**68.46**	5.83
Singapore	0.09	0.16	**-21.84**	-2.55	-1.94	-0.60	-21.87	-1.02	**-4.07**	-4.50	**18.29**	3.14	-22.75	-1.14	**-71.30**	-2.35	**56.49**	2.62
North America																		
Canada	0.12	0.20	-9.65	-1.06	-1.84	-1.87	-10.21	-0.48	-1.48	-1.47	9.27	0.75	2.85	0.34	**-48.50**	-3.48	**58.97**	5.02
U.S.	-0.75	-1.29	**-23.30**	-2.76	**-2.93**	-2.63	-23.30	-1.55	-0.96	-0.73	0.41	0.04	-0.55	-0.06	**-20.32**	-2.57	8.96	1.14

Notes.
The table reports the regression coefficients of running annual country value (HML) factors on future U.S. GDP (nominal gross domestic product in U.S. dollars) growth, the U.S. annual contemporaneous excess market return (calculated in this paper), and a single funding liquidity or a credit risk variable. Statistically significant coefficients are typeset in bold (*t*-statistic greater than 1.96 in absolute value). U.S. GDP data are available from the World Bank website. The last four columns report the same information but decomposing the HML as the sum of a portfolio long in value stocks and short in growth stocks. Specifically, the long portfolio is 0.5× (SV+BV) and the short portfolio is -0.5× (SG+BG). S and B denote Small and Big; V and G denote value and growth. The HML factor captures the return differential between stocks with high (value stocks) and low (growth stocks) ratios of book equity to market equity. The factor construction procedure closely follows Fama and French (2012) and is described in Section 2.4 of the paper. For brevity, only the coefficients (and the *t*-statistic) of funding liquidity or the credit risk variable are reported. Five funding liquidity variables are considered: VIX expressed as percentage points, the TED spread for the the United Staes, U.S. Libor rate, the Equal-Weighted average of G7 country TED spreads and Libor rates. Two credit risk variables are considered: the AAA − Treasury and BAA-AAA spreads for the United States. The definitions of the funding liquidity and credit risk variables are given in Section 2.3 of the paper. Excess U.S. market return is calculated in excess of the U.S. T-bill rate. All stock returns are converted into U.S. dollars. *t*-statistics are calculated using the Newey and West (1987) procedure allowing up to 3 years of autocorrelations. The data period is from 1991 to 2008.

Table 13
Exposure of country value factors to the liquidity factors in Pastor and Stambaugh (2003) and Sadka (2006).

	Sadka (2006)				Pastor and Stambaugh (2003)					
	Transitory		Permanent		Level		Innovations		Traded	
	coef.	*t*-stat.	coef.	*t*-stat.	coef.	*t*-stat.	coef.	*t*-stat.	coef.	*t*-stat.
Europe										
Austria	47.49	0.67	-23.28	-0.90	-0.57	-0.50	0.29	0.24	**5.33**	2.37
Belgium	86.43	1.47	2.34	0.13	1.64	1.55	1.31	1.09	-0.72	-0.40
Denmark	100.30	1.42	**91.81**	2.67	-0.67	-0.23	-0.83	-0.23	**9.50**	2.01
Finland	**285.68**	2.66	**100.12**	2.49	2.03	0.66	3.91	1.30	0.39	0.05
France	**201.47**	4.01	44.60	1.91	-0.43	-0.42	1.65	1.11	5.58	1.86
Germany	**138.99**	5.13	30.75	1.63	0.67	0.39	0.97	0.47	3.73	1.51
Greece	-136.09	-1.31	23.92	0.57	2.94	0.88	1.54	0.67	7.28	1.87
Ireland	323.52	1.35	**177.84**	2.76	5.24	1.38	**9.75**	2.16	**23.87**	2.91
Italy	103.51	1.66	27.29	1.31	-0.22	-0.13	1.18	0.59	4.71	1.84
Netherlands	21.54	0.32	10.71	0.61	0.92	0.71	-0.35	-0.21	-0.95	-0.41
Norway	**293.81**	2.61	30.31	1.87	1.82	1.01	**4.43**	1.97	**7.90**	3.49
Portugal	-3.12	-0.03	29.43	1.21	0.54	0.29	-0.19	-0.08	5.64	1.20
Spain	101.75	1.66	30.71	1.21	**2.29**	2.73	**2.71**	1.98	-0.22	-0.12
Sweden	**339.76**	3.59	75.24	1.71	0.28	0.13	2.08	0.77	**9.49**	2.60
Switzerland	70.75	1.37	-2.87	-0.15	0.16	0.14	0.93	0.77	1.73	0.97
U.K.	**198.22**	3.26	**73.94**	4.38	1.49	1.22	3.77	1.72	**5.82**	2.34
Asia Pacific and Japan										
Australia	**160.86**	2.21	12.68	0.42	-0.63	-0.59	-0.35	-0.18	1.25	0.42
Hong Kong	121.50	1.28	**48.82**	2.93	-1.04	-0.79	-0.34	-0.23	3.92	1.77
Japan	-11.54	-0.18	11.17	0.52	-1.98	-1.50	-3.20	-1.46	-1.71	-0.48
New Zealand	-35.64	-0.35	4.06	0.10	0.23	0.12	-2.10	-0.98	-2.19	-0.64
Singapore	-61.82	-0.92	46.86	1.85	-0.85	-1.19	-0.54	-0.29	4.50	1.50
North America										
Canada	**216.75**	3.79	23.75	1.19	0.23	0.18	2.50	1.35	**5.37**	2.21
U.S.	94.19	1.28	**45.58**	3.44	0.49	0.39	1.26	0.70	-0.66	-0.32

Notes.
The table reports the regression coefficients of running annual country value (HML) factors on U.S. future GDP (nominal gross domestic product in U.S. dollars) growth, the U.S. annual contemporaneous excess market return (calculated in this paper), and a single liquidity variable from variables introduced in Pastor and Stambaugh (2003) and Sadka (2006). Statistically significant coefficients are typeset in bold (*t*-statistic greater than 1.96 in absolute value). U.S. GDP data are available from the World Bank website. For brevity, only the coefficients (and the *t*-statistic) of Pastor and Stambaugh (2003) or Sadka (2006) liquidity variables are reported. The three liquidity variables available from Pastor and Stambaugh (2003) are Level, Innovation, and Traded liquidity variables. Two liquidity variables are available from Sadka (2006): transitory and permanent liquidity variables. The definitions of the five liquidity variables are given in Section 2.3 of the paper. The HML factor captures the return differential between stocks with high (value stocks) and low (growth stocks) ratios of book equity to market equity. The factor construction procedure closely follows Fama and French (2012) and is described in Section 2.4 of the paper. Excess U.S. market return is calculated in excess of the U.S. T-bill rate. All stock returns are converted into U.S. dollars. *t*-statistics are calculated using the Newey and West (1987) procedure allowing up to 3 years of autocorrelations. The data period is from 1991 to 2008.

Table 14 Momentum factor loadings on future GDP Growth and the market return.

	Global Δ GDP and Global Market					U.S. Δ GDP and U.S. Market					Country Δ GDP and Country Market				
	Δ GDP	*t*-stat.	Market−R_f	*t*-stat.	R-square	Δ GDP	*t*-stat.	Market−R_f	*t*-stat.	R-square	Δ GDP	*t*-stat.	Market−R_f	*t*-stat.	R-square
Europe															
Austria	0.08	0.18	-0.40	-1.00	0.16	-0.86	-1.58	-0.29	-0.83	0.19	0.25	1.62	-0.20	-0.73	0.10
Belgium	-0.47	-1.74	**-0.72**	-6.96	0.58	0.12	0.23	**-0.59**	-3.23	0.38	-0.09	-0.63	-0.35	-1.66	0.26
Denmark	-0.31	-1.11	-0.28	-1.01	0.10	-0.12	-0.26	-0.06	-0.24	0.01	**-0.22**	-2.50	-0.33	-1.42	0.29
Finland	-0.57	-0.92	0.23	0.53	0.08	-0.51	-0.65	0.41	0.92	0.07	-0.30	-1.19	0.22	1.23	0.22
France	-0.04	-0.15	-0.24	-1.21	0.12	-0.04	-0.06	-0.24	-0.91	0.12	-0.01	-0.07	-0.19	-1.18	0.09
Germany	-0.07	-0.15	-0.30	-1.16	0.11	0.04	0.05	-0.27	-0.78	0.09	-0.12	-0.74	-0.30	-1.60	0.17
Greece	**-0.85**	-2.15	0.04	0.14	0.16	-0.43	-0.85	0.27	0.84	0.06	**-0.41**	-4.43	0.06	0.67	0.35
Ireland	0.51	0.79	**-0.88**	-2.78	0.35	1.61	1.34	**-1.10**	-3.25	0.38	0.08	0.28	-0.46	-1.46	0.16
Italy	0.04	0.09	-0.20	-0.70	0.05	0.14	0.20	-0.24	-0.70	0.06	0.08	0.39	-0.15	-1.05	0.06
Netherlands	-0.31	-1.18	-0.16	-0.96	0.07	0.77	1.77	-0.10	-0.60	0.07	**-0.28**	-1.97	-0.08	-0.55	0.12
Norway	0.35	0.77	**-0.45**	-1.98	0.15	0.02	0.02	-0.37	-1.15	0.08	0.30	1.39	-0.28	-1.83	0.14
Portugal	-0.23	-0.72	-0.35	-1.87	0.15	-0.05	-0.11	-0.21	-1.07	0.06	-0.26	-1.39	-0.18	-1.59	0.13
Spain	-0.30	-1.34	**-0.40**	-2.56	0.26	-0.36	-0.59	-0.21	-0.98	0.11	-0.12	-1.17	-0.23	-1.77	0.18
Sweden	0.17	0.37	-0.26	-0.77	0.07	0.41	0.45	-0.19	-0.47	0.03	-0.17	-0.67	-0.25	-1.53	0.16
Switzerland	0.21	0.68	**-0.45**	-2.09	0.38	0.17	0.28	-0.48	-1.63	0.35	0.17	1.24	-0.32	-1.71	0.30
U.K.	0.02	0.07	-0.31	-1.02	0.11	0.42	0.65	-0.29	-0.91	0.08	-0.06	-0.33	-0.25	-1.04	0.09
Asia Pacific and Japan															
Australia	0.05	0.17	-0.05	-0.28	0.01	0.11	0.24	-0.01	-0.03	0.00	0.02	0.14	-0.10	-0.99	0.03
Hong Kong	0.55	1.07	0.34	1.73	0.14	-0.25	-0.19	0.32	0.85	0.08	-0.30	-1.12	0.16	1.19	0.12
Japan	-0.42	-0.97	0.04	0.15	0.03	-0.77	-1.20	0.21	0.61	0.03	0.18	0.84	0.27	0.82	0.08
New Zealand	-0.02	-0.05	-0.34	-1.23	0.10	**1.23**	3.19	-0.22	-1.21	0.10	0.08	0.52	-0.16	-1.13	0.06
Singapore	0.76	1.76	-0.09	-0.61	0.13	-0.76	-0.83	-0.19	-0.76	0.10	0.30	1.26	0.03	0.26	0.14
North America															
Canada	0.35	0.77	0.16	0.43	0.03	0.54	0.75	0.14	0.35	0.05	0.07	0.27	0.12	0.40	0.02
U.S.	-0.37	-0.91	0.22	0.68	0.11	-0.34	-0.52	0.23	0.66	0.05	-0.34	-0.52	0.23	0.66	0.05

Notes.
The table reports the regression coefficients of running annual country momentum (WML) factors on future GDP (nominal gross domestic product in U.S. dollars) growth and contemporaneous excess market return. Statistically significant coefficients are typeset in bold (*t*-statistic greater than 1.96 in absolute value). For each country, three sets of regressions are run. The first set uses global GDP growth and global excess market return. The second set uses U.S. GDP growth and U.S. excess market return (calculated in this paper). The third set uses the country's own GDP growth and excess market return. GDP data for all countries are available from the World Bank website up to 2011. Future GDP growth (Δ) at year t is the three-year GDP growth; therefore is defined as $GDP_{t+3}/GDP_t - 1$. The WML factor captures the return differential between stocks with high returns (winner stocks) in the previous year (from months $t-11$ to $t-1$, excluding the last month) and loser stocks with low returns in the same period. The factor construction procedure closely follows Fama and French (2012) and is described in Section 2.4 of the paper. Global market return is the market return factor calculated for developed economies available from Ken French's website. Excess market returns are calculated in excess of the U.S. T-bill rate. All stock returns are converted into U.S. dollars. *t*-statistics are calculated using the Newey and West (1987) procedure allowing up to 3 years of autocorrelations. The data period is from 1991 to 2008.

Table 15 Funding liquidity and credit risk exposure of country momentum factors.

	VIX		U.S. TED		U.S. LIBOR		G7 TED		G7 Libor		AAA -Treasury		BAA-AAA		U.S. TED (long)		U.S. TED (short)	
	coef.	*t*-stat.	coef.	*t*-stat.	coef.	*t*-stat.	coef.	*t*-stat.	coef.	*t*-stat.	coef.	*t*-stat.	coef.	*t*-stat.	coef.	*t*-stat.	coef.	*t*-stat.
Europe																		
Austria	0.43	0.43	21.55	1.10	-4.25	-1.87	43.27	1.19	-0.47	-0.19	6.98	0.49	**47.66**	2.63	**-73.42**	-3.69	**95.34**	5.98
Belgium	0.86	1.54	**28.67**	5.03	1.26	0.75	**53.88**	4.27	0.18	0.22	-1.49	-0.12	18.43	1.45	**-31.20**	-3.02	**71.81**	7.91
Denmark	1.23	1.83	**32.59**	5.22	-1.75	-0.77	**60.02**	3.82	2.51	1.30	6.59	0.55	**38.95**	5.08	**-55.09**	-4.42	**102.95**	8.60
Finland	1.07	0.81	7.13	0.28	1.36	0.42	7.45	0.16	-0.33	-0.13	-5.59	-0.22	0.84	0.04	-37.41	-1.17	**60.12**	4.19
France	-0.21	-0.50	-7.90	-0.83	-0.57	-0.19	-11.55	-0.57	-1.15	-1.04	-8.87	-1.04	3.71	0.21	**-36.90**	-3.54	**38.61**	4.91
Germany	0.37	0.65	-4.02	-0.31	0.10	0.03	1.49	0.05	-2.31	-1.33	-0.64	-0.04	3.80	0.18	**-26.72**	-2.55	**22.2**	2.11
Greece	0.36	0.42	**27.35**	2.33	1.74	0.39	**63.61**	2.15	1.74	0.93	-14.38	-0.61	7.07	0.25	56.57	0.87	29.91	1.12
Ireland	1.30	1.81	18.53	1.00	-4.77	-1.03	49.21	1.81	-0.07	-0.04	9.08	0.50	**59.60**	2.92	**-61.07**	-5.17	**127.72**	6.14
Italy	0.41	0.74	-2.62	-0.21	-0.67	-0.17	3.82	0.13	-2.10	-1.15	1.91	0.12	8.74	0.38	-20.57	-0.90	**33.32**	2.07
Netherlands	0.22	0.38	15.93	1.57	1.40	0.45	25.50	1.44	1.69	1.38	**-15.79**	-2.17	1.65	0.10	**-26.38**	-2.43	**54.36**	8.10
Norway	-0.19	-0.15	-12.18	-0.66	-1.30	-0.38	-15.58	-0.40	-3.03	-1.82	-18.26	-0.95	-0.37	-0.02	**-81.64**	-4.23	**94.20**	5.41
Portugal	-0.23	-0.32	14.23	1.06	-1.41	-0.54	36.10	1.60	0.55	0.41	**-24.18**	-2.51	28.96	1.96	**-43.77**	-4.05	**71.97**	3.66
Spain	-0.09	-0.21	0.68	0.07	0.96	0.35	11.57	0.52	0.86	0.80	-16.09	-1.43	9.57	0.64	-37.11	-1.95	**37.53**	3.17
Sweden	0.66	0.89	-5.48	-0.30	0.12	0.03	-22.37	-0.73	0.22	0.13	-5.34	-0.46	9.72	0.41	**-45.04**	-3.61	**60.33**	6.59
Switzerland	0.29	0.74	-7.84	-0.72	0.45	0.22	-11.01	-0.47	0.16	0.14	0.03	0.00	2.60	0.17	**-25.70**	-2.13	15.70	1.39
U.K.	0.48	1.25	9.36	0.77	-0.18	-0.03	15.40	0.54	1.07	0.64	-4.57	-0.34	19.00	0.72	**-36.82**	-4.68	**87.69**	7.02
Asia Pacific and Japan																		
Australia	**1.26**	2.01	12.02	0.93	-1.07	-0.40	37.79	1.20	-2.75	-1.85	10.64	0.82	9.45	0.56	**-55.95**	-3.67	**93.91**	5.56
Hong Kong	-0.33	-0.35	**-40.38**	-3.52	-4.68	-1.74	-48.68	-1.91	**-3.67**	-2.14	2.08	0.16	11.14	0.41	**-73.91**	-2.57	26.62	1.68
Japan	1.42	1.30	**28.70**	2.21	-0.53	-0.15	74.59	1.90	-2.98	-1.25	5.50	0.27	7.25	0.29	6.98	0.25	25.60	0.92
New Zealand	-0.48	-0.71	-2.37	-0.24	1.99	0.92	-1.92	-0.12	1.87	0.85	-9.82	-0.87	-24.19	-1.58	**-61.37**	-4.17	**71.18**	5.03
Singapore	**-2.11**	-2.37	**-45.50**	-3.02	-4.73	-1.89	**-62.49**	-2.93	-0.99	-0.66	-16.74	-1.07	-2.59	-0.15	**-82.70**	-2.79	43.36	1.73
North America																		
Canada	0.71	0.82	-2.20	-0.13	-0.29	-0.06	11.88	0.26	-1.14	-0.51	5.54	0.24	-1.33	-0.05	**-40.99**	-3.15	**55.94**	4.95
U.S.	0.70	0.80	12.42	0.78	0.80	0.27	15.37	0.47	0.05	0.03	0.90	0.04	7.06	0.35	0.19	0.02	**23.15**	3.21

Notes.
The table reports the regression coefficients of running annual country momentum (WML) factors on future U.S. GDP (nominal gross domestic product in U.S. dollars) growth, the U.S. annual contemporaneous excess market return (calculated in this paper), and a single funding liquidity or a credit risk variable. Statistically significant coefficients are typeset in bold (*t*-statistic greater than 1.96 in absolute value). U.S. GDP data are available from the World Bank website. The last four columns report the same information but decomposing the WML as the sum of a portfolio long in winner stocks and short in loser stocks. Specifically, the long portfolio is 0.5× (SW+BW) and the short portfolio is -0.5× (SL+BL). S and B denote Small and Big; W and L denote winner and loser. The WML factor captures the return differential between stocks with high returns (winner stocks) in the previous year (from months $t-11$ to $t-1$, excluding the last month) and loser stocks with low returns in the same period. The factor construction procedure closely follows Fama and French (2012) and is described in Section 2.4 of the paper. For brevity, only the coefficients (and the *t*-statistic) of funding liquidity or the credit risk variable are reported. Five funding liquidity variables are considered: VIX expressed as percentage points, the TED spread for the United States, the U.S. Libor rate, Equal-Weighted average of G7 country TED spreads and Libor rates. Two credit risk variables are considered: the AAA − Treasury and BAA-AAA spreads for the United States. The definitions of the funding liquidity and credit risk variables are given in Section 2.3 of the paper. Excess U.S. market return is calculated in excess of the U.S. T-bill rate. All stock returns are converted into U.S. dollars. *t*-statistics are calculated using the Newey and West (1987) procedure allowing up to 3 years of autocorrelations. The data period is from 1991 to 2008.

Table 16 Exposure of country momentum factors to the liquidity factors in Pastor and Stambaugh (2003) and Sadka (2006).

	Sadka (2006)				Pastor and Stambaugh (2003)					
	Transitory		Permanent		Level		Innovations		Traded	
	coef.	*t*-stat.	coef.	*t*-stat.	coef.	*t*-stat.	coef.	*t*-stat.	coef.	*t*-stat.
Europe										
Austria	55.76	0.67	-13.58	-0.26	-0.75	-0.53	-0.10	-0.03	-3.56	-0.76
Belgium	**-132.86**	-3.46	**-37.61**	-2.42	**-2.49**	-2.20	**-3.51**	-2.37	**-5.85**	-2.39
Denmark	-85.86	-0.95	**-54.93**	-2.62	**-2.85**	-2.18	-3.34	-1.15	-5.94	-1.20
Finland	**-305.02**	-3.56	-8.72	-0.19	-1.87	-0.87	-2.29	-0.96	0.85	0.15
France	-0.66	-0.02	**29.63**	1.98	0.14	0.14	1.57	1.23	1.92	0.75
Germany	73.90	1.27	32.39	1.43	1.10	0.64	2.83	1.54	4.00	1.11
Greece	76.43	0.64	**-56.64**	-3.28	0.40	0.24	0.75	0.34	-4.06	-1.71
Ireland	75.71	0.89	-43.06	-1.05	**-4.79**	-4.27	-2.99	-0.96	0.67	0.15
Italy	**113.23**	2.13	25.00	1.14	1.37	0.97	**3.68**	2.11	5.10	1.37
Netherlands	-41.40	-0.77	-28.92	-1.37	-1.30	-0.76	-0.53	-0.31	-1.30	-0.44
Norway	13.57	0.10	62.19	1.39	-2.20	-1.01	0.59	0.22	4.48	1.18
Portugal	4.03	0.02	0.26	0.01	0.34	0.16	-0.17	-0.06	**-5.66**	-2.88
Spain	40.80	0.42	8.31	0.51	0.46	0.34	0.88	0.49	-3.89	-1.47
Sweden	-79.76	-0.61	21.99	0.64	-1.76	-1.01	-0.08	-0.03	3.47	0.65
Switzerland	34.40	0.95	11.49	0.52	0.01	0.01	0.64	0.63	1.27	0.48
U.K.	**170.94**	2.80	-14.63	-0.52	0.81	0.57	3.38	1.44	3.15	0.70
Asia Pacific and Japan										
Australia	109.17	1.34	3.04	0.11	0.08	0.04	2.49	1.07	5.28	1.70
Hong Kong	133.20	1.24	**103.26**	3.44	0.65	0.26	3.36	1.06	6.53	1.39
Japan	141.73	1.01	-14.18	-0.45	3.02	1.19	4.96	1.83	4.99	1.22
New Zealand	-13.11	-0.10	17.06	0.67	1.65	1.05	3.32	1.89	-4.97	-0.80
Singapore	**315.40**	2.43	**97.74**	2.81	4.07	1.64	6.64	1.89	3.33	0.83
North America										
Canada	**270.12**	4.82	15.35	0.49	2.57	1.38	**5.68**	3.31	7.04	1.73
U.S.	-52.59	-0.65	-23.60	-1.17	0.70	0.52	0.28	0.19	2.94	1.38

Notes.
The table reports the regression coefficients of running annual country momentum (WML) factors on U.S. future GDP (nominal gross domestic product in U.S. dollars) growth, the U.S. annual contemporaneous excess market return (calculated in this paper), and a single liquidity variable from variables introduced in Pastor and Stambaugh (2003) and Sadka (2006). Statistically significant coefficients are typeset in bold (*t*-statistic greater than 1.96 in absolute value). U.S. GDP data are available from the World Bank website. For brevity, only the coefficients (and the *t*-statistic) of Pastor and Stambaugh (2003) or Sadka (2006) liquidity variables are reported. The three liquidity variables available from Pastor and Stambaugh (2003) are Level, Innovation, and Traded liquidity variables. Two liquidity variables are available from Sadka (2006): transitory and permanent liquidity variables. The definitions of the five liquidity variables are given in Section 2.3 of the paper. The WML factor captures the return differential between stocks with high returns (winner stocks) in the previous year (from months $t-11$ to $t-1$, excluding the last month) and loser stocks with low returns in the same period. The factor construction procedure closely follows Fama and French (2012) and is described in Section 2.4 of the paper. Excess U.S. market return is calculated in excess of the U.S. T-bill rate. All stock returns are converted into U.S. dollars. *t*-statistics are calculated using the Newey and West (1987) procedure allowing up to three years of autocorrelations. The data period is from 1991 to 2008.

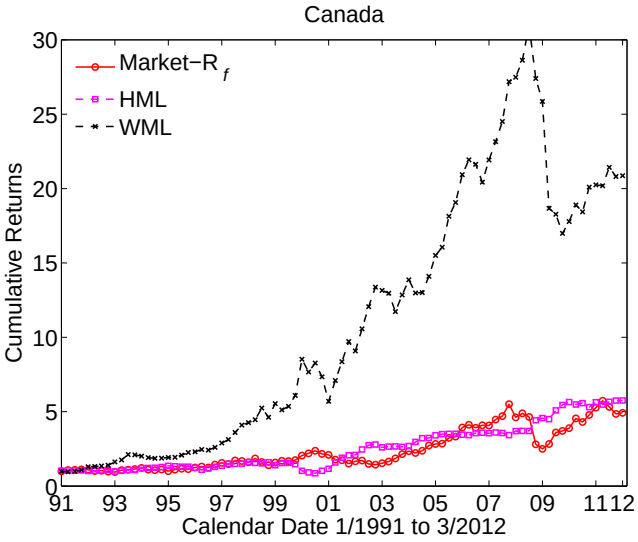

Figure 1.*A*.

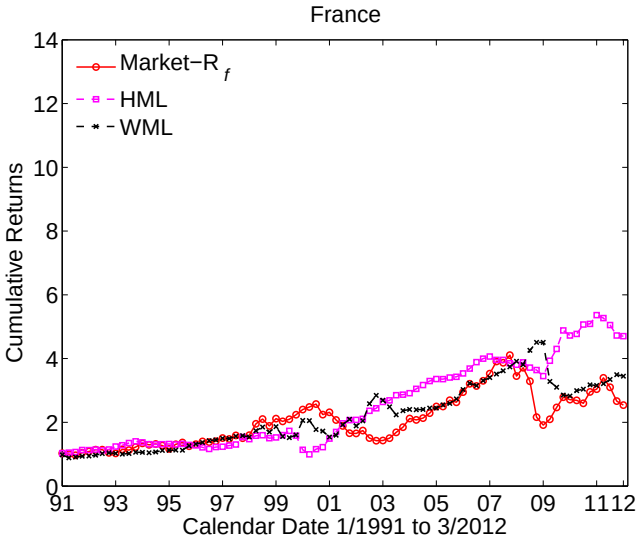

Figure 1.*B*.

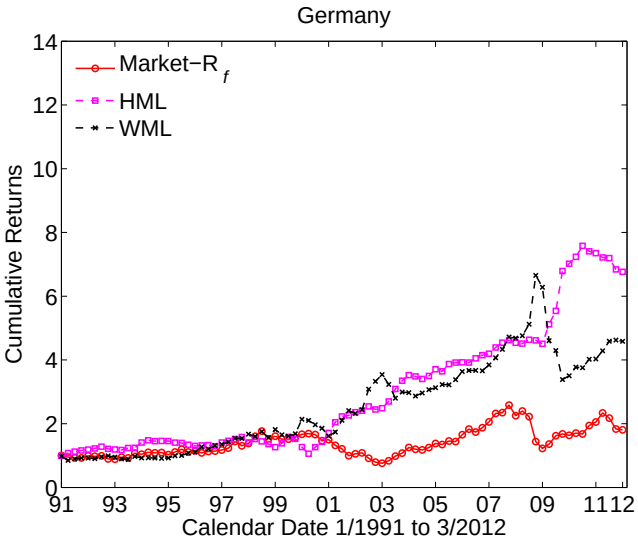

Figure 1.*C*.

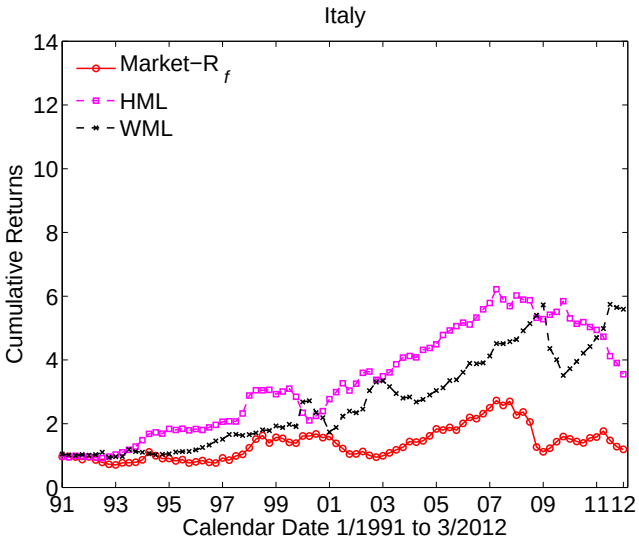

Figure 1.*D*.

Figure 1. Graphs 1.A to 1.G plot cumulative returns of monthly Market - R_f, Value (HML) and Momentum (WML) factors in the G7 countries: Canada, France, Germany, Italy, Japan, U.K., and the United States. The data period is from January 1991 to March 2012. The HML factor captures the return differential between stocks with high (value stocks) and low (growth stocks) ratios of book equity to market equity. The WML factor captures the return differential between stocks with high returns (winner stocks) in the previous year (from months $t-11$ to $t-1$, excluding the last month) and loser stocks with low returns in the same period. The factor construction procedure closely follows Fama and French (2012) and is described in Section 2.4 of the paper. Excess market returns are calculated in excess of the U.S. T-bill rate. All stock returns are converted into U.S. dollars.

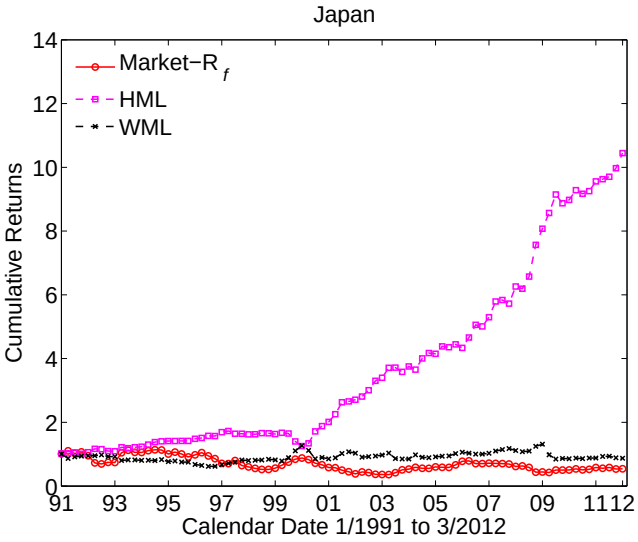

Figure 1.*E*.

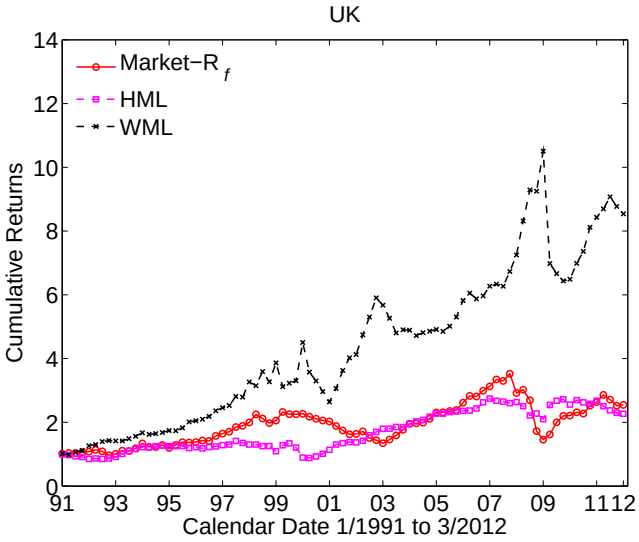

Figure 1.*F*.

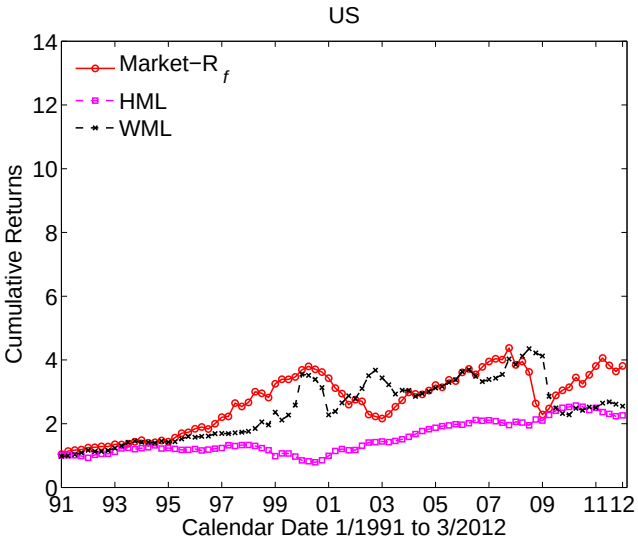

Figure 1.*G*.

Figure 1. Continued from previous page.