The Trade Network and Asset Pricing: Evidence from the Sovereign CDS Market

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Abstract

We find that a country's export destinations' sovereign credit risk change can predict the country's own future sovereign CDS price movement. A strategy that goes long sovereign CDS with the highest export destination risk increase and sells short CDS with the lowest risk increase generates an average annualized return of 5.76% with a Sharpe ratio of 1.10. Our evidence indicates that the CDS return predictability is driven by the slow moving export destination risk information which travels through the trade network. Our evidence suggests that investors' limited attention causes the slow incorporation of the export destination risk information. Moreover, we show that export destination risk also predicts countries' future stock index return and macro variables, such as the export growth, GDP growth and PMI.

JEL Classification Number: G12.

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Introduction

The study of financial derivatives has been at the centerpiece of the finance literature for decades (e.g. Black, 1975). While most studies focus on the firm level derivatives, we add to the literature by studying the sovereign derivative pricing and the macro information flow. Unlike the firm derivatives, where the private information and the adverse selection play an important role, since the macro information is publically available, investors' information processing capacity and speculative trading play a dominant role. Moreover, given the fact that macro information is much more complicated than firm information, the sovereign derivatives provide an ideal opportunity for studying how public complex macro information is being processed by investors and being incorporated into the asset prices.

In this paper, we focus on the most important sovereign derivative contract, the sovereign credit default swap (CDS). Sovereign CDS market has experienced rapid development since early 2000s. By 2015, this market has an aggregate notional amount of around $2 trillion, and covers 88 countries in our sample. It moved into the spotlight of the financial market during the European Debt Crisis and was accused of spreading the panic due to the volatile and heavily correlated price movement. It is, therefore, important to understand how sovereign CDS price responds to macro information and how the sovereign CDS prices are interconnected.

The international trade plays an increasing important role in countries' economic activities in recent years. As shown in Figure 1, the average export-to-GDP ratio among countries in our sample has grown from 43 percent in 2001 to 48 percent by 2015. Since export is a major source to generate foreign reserve and to serve foreign debt, it is crucially in determining a country's sovereign credit risk. If a country's major export destination countries experience negative sovereign credit risk shocks, the country would suffer anexport decline, which tends to drive up its 's sovereign credit risk. The trade linkage between countries, therefore, provides a channel through which the sovereign credit risk in the importing countries could be spread to the exporting countries.

Is the sovereign credit risk information of the export destination countries being incorporated into the exporting country's sovereign CDS price instantly? If investors take into account the ex-ante publically available trade network information, the exporting countries' sovereign CDS spread should respond to their export destination countries' sovereign CDS spread changes immediately. In contrast, if investors have limited attention, the exporting countries' sovereign CDS spread will have a predictable lag on reflecting their export destination risk information, which implies the return predictability of the sovereign CDS.

Consistent with investors' underreaction to the export destination riskwe document the existence of predictable pattern in sovereign CDS returns.. In the empirical analysis, for each country, we calculate the weighted average of its export destination countries' sovereign CDS returns in the past three months as the export destination risk proxy, using the bilateral export from the underlying country as the weight. For instance, if country A exports 70 percent of its product to country B, and the rest 30 percent to country C, the export destination risk proxy is calculated as 70%**country B's Sovereign CDS return*+30%**country C' sovereign CDS return*. We show that our proxy indeed contains information about the exporting countries' future economic activities. A higher sovereign CDS return would predict lower future export and GDP growth and PMI indices.

We test the predictive power of the export destination risk proxy by forming a long/short trading strategy. At the beginning of each month, we sort all the countries into quintile groups based on their export destination risk proxy. Group 1 includes countries with the lowest proxy. These countries have their export destination countries' sovereign credit risk increased the least (or decreased the most) during the past three months according to the sovereign CDS market. Similarly, the countries in group 5 have their export destination countries' credit risk increased the most. Presumably, the export destination risk proxy indicates good news for group 1 countries' export, and bad news for those of group 5 countries. If countries' sovereign CDS prices reflect this information with a delay, we should expect that in the following couple of months, the sovereign CDS returns in group 5 outperform those in group 1, on average.

Indeed, by going long sovereign CDS in group 5 and selling short sovereign CDS in group 1 and forming an equally weighted portfolio for the next month, one can achieve an average annualized return of 5.7 percent with a t-statistic of 3.69 and Sharpe ratio of 1.10. After accounting for the risk factors in the sovereign CDS market (Xiao, Yan and Zhang 2017) and global asset markets (Asness, Moskowitz and Pedersen 2008), the strategy can still generate an abnormal annual return of 3.6 percent with a t-statistic of 2.62 and Sharpe ratio of 0.85.

Moreover, when we increase the holding period to about 14 months, the cumulative return of the long/short portfolio stabilizes at around 4 percent, and does not display a reversal when further increasing the holding period. This is consistent with the interpretation that sovereign CDS market gradually incorporates the information on countries' export destination risk.

Although our findings fit the interpretation of lagged export destination risk information flow from the export destination countries to the exporting country, there are several alternative explanations. For example, the return predictability could be associated with the momentum effect in the sovereign CDS market (Xiao, Yan and Zhang 2017). We address this concern by controlling for the sovereign CDS momentum return when calculating the abnormal return of the long/short portfolio. As an alternative, in a Fama-MacBeth framework, we regress the CDS return in month t+1 on both the past three sovereign CDS return and the export destination risk proxyand find that the predictive power of the export destination risk proxy remains significant both economically and statistically.

Another alternative interpretation is that our export destination risk proxy's predictive power stems from its correlation with some local risk factors. For instance, a country may have close geopolitical/cultural/economic similarities with its important trading partners, which makes these trading partner countries exposing to the same shocks. Therefore, the trading partners' sovereign credit risk change could contain information on the underlying country's sovereign credit risk in the future. To pin down this hypothesis, we introduce an import source risk proxy, which is the import-weighted average of a country's import source countries' sovereign CDS returns. Since trade between two countries is usually bilateral, a country's export destination countries and import source countries are generally the same group of countries, which makes the import risk proxy and the output risk proxy differ only in their weights If the alternative interpretation is correct, the export destination risk proxy and the import source risk proxy should have similar return predictability on the underlying country's sovereign CDS return. There is no obvious reason why the export destination risk proxy should have a superior predictability compared to the import source risk proxy. In sharp contrast, our hypothesis predicts that only the export destination risk proxy has the return predictability, as risk can only spread from the import country to the export country not the other way around. A Fama-MacBeth regression test with both the export destination risk proxy and the import source risk proxy as the independent variables finds that only the export destination risk proxy has the predictive power, but not the import source risk proxy, which lends support to our trade linkage hypothesis

A third alternative interpretation is that the return predictability comes from the financial linkage rather than the trade linkage between countries. That is, the sovereign credit risk spreads across countries through capital flow rather than trade. . For instance, the United States is both China's major capital inflow source country. A negative shock on the US economy could reduce its capital outflow toward China, driving up China's sovereign credit default risk. There are two types of capital flow between countries. The foreign direct investment (FDI) mainly refers to the long term equity investment, while the portfolio investment refers to the debt investment and speculative equity investment. To capture the FDI inflow/outflow risk, we introduce both the inward and outward FDI risk proxies for each country. The inward (outward) FDI risk proxy is the inward (outward) FDI-weighted average of the FDI source (destination) countries' CDS returns. Similarly, we also introduce the inward (outward) portfolio investment risk proxy for each country, using the inward (outward) portfolio investment as the weight.. In the Fama-MacBeth regression test, we include the export destination risk proxy, the inward (outward) FDI risk proxy and the inward (outward) portfolio investment risk proxy as the independent variables and find that only the predictive power of the export destination risk proxy is significant. This result lends support to our hypothesis that the return predictability comes from the slow movement of the export destination risk information, rather than the capital flow risk information.

A natural following question is what causes investors' slow reaction tothe export destination risk information. We investigate investor's limited attention hypothesis by exploiting variations in investors' attention and the nature of information through time, across countries and find four supporting evidences.

First, investors capture a country's export destination risk information more quickly when they are more likely to pay attention to the export destination countries. Since the sovereign credit rating/outlook changes are major credit events, they often draw close attention among investors. For any given country, the more credit rating/outlook changes its export destination countries experience recently, the more likely investors would realize the underlying country's export destination risk. Hence, the limited attention hypothesis implies that the long/short portfolio strategies should be less profitable in the period when countries in the long/short portfolio have more of their export destination countries go throughcredit rating/outlook changes recently.

To test this implication, we run a panel regression of country *c*'s sovereign CDS return in month *t*+1 on a return predictor constructed by our export destination risk information proxy in month *t*, and a credit event variable, which is the total number of credit rating and outlook changes announced by Moody's, Standard & Poor and Fitch among country *i*'s export destination countries from the month *t*-2 to *t*. Our primary focus is on the coefficient for the interaction term of the predictor and this credit event variable. Our estimates show that a one standard deviation increase in the number of credit rating/outlook changes among the export destination countries during the past three months would reduce the predicative power of the return predictor by 23 percent.

Second, the limited attention hypothesis implies asymmetric effect of the credit event variable on the predictor for positive export destination risk information and negative one. More specifically, a country would be more likely to attract investors' attention on its export destination risk, should its importing countries experience significant amount of negative credit rating/outlook changes. Literature shows that investors' reaction to positive and negative information is not the same, with the negative news being more salient and attracting more attention. For instance, Soroka (2006) discovered strong asymmetries in mass media responsiveness to positive and negative economic shifts and in public responsiveness. Da, Huang and Jin (2017) shows that negative stock returns are more likely to capture investors' attention to update stock return expectation than positive stock returns. In the stock market literature, the asymmetric price response to positive and negative information is often explained by investors' short sell constraint, as selling short is often more risky and costly. In contrast, since sovereign CDS is derivative contract, which does not subject to the short sell constraint, the asymmetric price response in the sovereign CDS market would most likely be driven by investors' asymmetric attention. In the empirical test, we find that the sovereign CDS price in the following month responses to the export destination risk information in the current month more weakly, when the export destination risk proxy was anticipating negative news from the trading partners. Specifically, the effect of the credit event variable in reducing the predictive power of the return predictor is two times higher when the return predictor is anticipating negative news than is anticipating positive news. And the predictive power reduction is only statistically significant when the return predictor is anticipating negative news.

Third, if investors have limited attention on a country's direct export risk, it would be even more difficult for them to recognize the "second order effect", i.e. the indirect export destination risk. For instance, if country A is country B's major export destination country, a negative sovereign credit risk shock on country A could reduce its import from country B, thereby spreading the sovereign credit risk from A to B. Similarly, if country B is a major export destination of country *C*, the initial sovereign credit risk shock on A could then be spread to country *C* indirectly through country B. We introduce an indirect export destination risk proxy for each country trying to capture the second order export risk. By testing investors' different levels of understanding of the information from the direct and indirect export channels, we find that investors incorporate the direct export destination risk information more quickly than the indirect information. More specifically, while the predictability of the direct export destination risk proxy is significant immediately after the formation of the proxy, the predictability of the indirect export destination risk proxy does not show up until two weeks later.

Fourth, other measures of investors' attention, such as the liquidity and the country's importance in the trade network, also affect the magnitude of the return predictability. Qiu and Fan (2012) shows that the liquidity of a country's sovereign CDS is endogenous and is affected by investors' attention. The more attention investors pay on a country, the more liquid the country's CDS would be. In addition, we also use a country's centrality in the global trade network as a proxy for investor attention, as investors are presumably more likely to investigate the export risk for those trade center countries. We use the bilateral trade data to calculate each country's eigen-centrality in the trade network as a measure of centrality. The eigen-centrality measure has been widely used in the network analysis (e.g. Acemoglu, Ozdaglar and Tahbaz-Salehi 2010, 2013 and Allen, Franklin and Ana Babus, 2011) as a measure of the connectedness of each node in a network. Consistent with the limited attention hypothesis, we find that the return predictability is more pronounced for CDS with lower liquidity and centrality.

This paper contributes to the literature by illustrating a new pricing mechanism in the sovereign CDS market. While Pan and Singleton (2008), Longstaff, Pedersen, Pan and Singleton (2011) and Augustin and Tedongap (2014) document the comovement of sovereign CDS price with global systemic risk factors, others show the relationship between sovereign CDS price and country-specific risk. Acharya et al. (2014) illustrates how the financial strain of contingent debt burden from public bank bailouts may feed into the sovereign credit risk. Aizenman et al. (2013) shows that the country-specific macroeconomic risk also feed into the sovereign CDS spread. Lee et al. (2016) documents that CDS spreads are related to the degree of property and creditor rights and disclosure requirement. Complementary to these domestic financial, macroeconomic and institutional factors, we find that the export destination countries' risk also plays an important role in determining the sovereign CDS spread.

Our paper also sheds light on how sovereign credit risk spills over across countries. The existing literature focuses on the sovereign credit risk spillover during the European Debt Crisis, when the market is in a panic and excessively volatile situation. For example, Beirne and Fratzscher (2013) attribute the cross country sovereign credit risk spillover to investors' increase in their sensitivity to country-specific fundamentals. In contrast, our paper shows that the sovereign credit risk spillover exists not just in crisis, but also in normal times and the spillover is through the global trade network. Moreover, the export destination risk can be spread not only through the direct trade linkage, but also through the indirect trade linkage.

This paper further contributes to investors' limited attention and information processing capacity literature. Our findings shed light on the slow diffusion of the macroeconomic information in the financial derivative market, which is linked to prior literature on the diffusion of firm information in stock market (e.g. Cohen and Frazzini 2008; Cohen and Lou 2012; Hou 2007). Our findings show that even the financial derivative market, which is presumably more efficient in aggregating information than stock markets (e.g., Easley, O'Hara and Srinivas, 1998 and Pan and Poteshman, 2006), is subject to investors' limited attention.

Finally, this paper also relates to the informational role of the derivative market. A large body of studies has been dedicated to the understanding of how information flows across markets. For instance, Black (1975) emphasizes that the embedded leverage allows investors to trade their information more efficiently. There is debate on the direction of information flow between the derivative market and other asset markets. On the one hand, Acharya and Johnson (2007) find that the CDS market appears to be able to forecast future negative credit event. Lee, Naranjo, and Sirmans (2014) show that corporate CDS market can improve the momentum strategy return in the stock market. On the other hand, Hilscher, Pollet and Wilson (2014) find evidence that information flows from equity market to corporate CDS market. Our paper contributes to the debate by providing additional evidence that the sovereign CDS contains information which incorporates into the stock indices gradually through the trade channel.

II. Data and Method

2.1 Data

A. Sovereign Credit Default Swap

Our sovereign CDS data comes directly from the Markit Inc.. The Markit Inc. collects daily sovereign CDS quotation data from the major sovereign CDS dealers and publishes the average sovereign CDS spread following a rigorous data validation procedure. Our sample covers 91 sovereign countries, from January 2001 to September 2015. The detailed country list and the starting time of each country are listed in the appendix. The countries with active sovereign CDS contract traded were 29 in 2001, and this number has grown to 91 by 2015. Our study focuses on sovereign CDS contracts, which are US dollar denominated, five-year maturity, with the default tier being senior unsecured debt and under the restructure clause CR/CR14[1]. We choose this type of sovereign CDS contract because they are the most actively traded and have

[1] While the corporate CDS are usually traded under XR or MMR, sovereign reference entities typically trade with CR/CR14. This means that there is no maturity limitation on deliverable obligations beyond the usual 30 years in the event of a restructuring credit event.

the highest market liquidity. Table 1 provides summary statistics of our sovereign CDS data. The average CDS par spread is 241 bps, with a standard deviation of 556 bps. The monthly average sovereign CDS return is -0.02%, with a standard deviation of 2.59%. On average, a CDS contract has about 5.9 dealers providing price quotations with a standard deviation of 3.2.

B. The calculation of the sovereign CDS return

The sovereign CDS allows market participants to purchase or sell protection against the risk of default of a sovereign government. During the term of the Sovereign CDS contract, the buyer makes quarterly payments, the CDS coupon/spread, to the seller in exchange for the seller's promise of protection. Should a credit event[2] occurred, the parties would settle the contract to allow the buyers to collect their credit risk protection payments, which is the face value loss of the sovereign debt.[3]

Following the standard market practice, the sovereign CDS return is defined as the profit/loss (P&L) of trading unit $1 nominal protection during a period of time. We calculate the mark-to-market sovereign CDS return using the standard ISDA CDS model, which is standard in the industry and is described in detail in O'Kane (2008). The sovereign CDS return increases when the underlying country's creditworthiness deteriorates, that is, a higher sovereign CDS return indicates bad news

In applying our data in the standard valuation model, there are two practical issues. First, there are four fixed premium payment dates each year in the sovereign CDS market: March 20, June 20, September 20 and December 20. A 5-year contract will mature in the first premium payment date after the contract exists for 5 years. For instance, a new 5-year sovereign CDS

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[2] The credit event is determined by the ISDA "Determinations Committee", and according to the ISDA definitions includes: failure to pay, moratorium, obligation acceleration, and restructuring.

[3] In most cases, the parties use "cash settle" with an auction process, in which the CDS seller make a cash payment based on an auction-generated market price of certain eligible debt obligation of the sovereign government. An alternative settlement is the "physical settle", in which the protection buyers tender an eligible bond to the sellers and receive the par value of the bond.

launched between March 20, 2015 and June 19, 2015 will mature on June 20, 2020, unless a credit event is triggered before that day. The new sovereign CDS contract traded in the market before the next premium payment dates is called on-the-run contract and has the best liquidity (Our Sovereign CDS price data are all on-the-run spreads). Given this institutional setup in the sovereign CDS market, we compute the monthly CDS return based on the spreads on the 20th of a month and on the 19th of the next month to make sure that these two spreads are for the same CDS contract.

Second, if the credit event happens during the holding period of the sovereign CDS, the monthly return should be the realized loss of the bond, 1-*R*. We use the realized recovery rate *R* provided by the Creditex Group[4] to calculate the sovereign CDS return in case of default. There have been three sovereign defaults from Jan. 2001 to Sep. 2015 which effectively triggered a sovereign CDS credit event and that were subsequently auction-settled: Ecuador in 2009, Greece in 2012 and Argentina in 2014. Among them, the Greece settlement was with a recovery rate *R*=21.5%, the Argentina settlement was with *R*=39.5% and the Ecuador was with *R*=31.6%. We use these auction results as the SCDS return in the default months.

C. Other data

Our bilateral trade data comes from the United Nations Commodity Trade Statistics Database (UN-Comtrade), which has collected the country level US dollar denominated annual bilateral trade data and has updated to 2015. Table 1 shows that from 2001 to 2015, on average, a country exports to 78 countries and export accounts for 47.5% of a country's GDP in our sample. The significant magnitude of the export implies the importance role trade plays in determining a country's economic growth and sovereign credit risk. We also use the United Nation UNCTAD's Bilateral FDI Statistics database to collect the bilateral FDI data and the IMF Coordinated

[4] http://www.creditfixings.com/CreditEventAuctions/AuctionByYear.jsp?year=2013 is the web address of the Creditex Group.

Portfolio Investment Survey (CPIS) database to collect the bilateral portfolio investment data. Both the FDI and the portfolio investment data cover a period from 2001 to 2012.

Other macroeconomic data, including the yearly GDP growth, the monthly seasonality adjusted CPI inflation and the export to GDP ratio are all collected from the International Monetary Fund World Economic Outlook (WEO) database. In our sample period, the average yearly GDP growth rate was 3.7% with a standard deviation of 4.3%, while the seasonality adjusted month over month inflation rate was 0.37% with a standard deviation of 0.8%.

We also collect the manufacture purchasing manager index (PMI) data from Markit's Global PMI database. PMI is a key economic indicator derived from monthly surveys of private sector companies in six different categories: production level, new orders from customers, speed of supplier deliveries, inventories, order backlogs and employment level. If the PMI index is larger (smaller) than 50, it implies that the economy is expanding (contracting). In the paper, we focus on the headline PMI which incorporates all the sub-indices. Towards the end of our sample, we have 38 countries with both the PMI and CDS data. The average headline PMI is 51.3 with a standard deviation of 4.9.

We collect sovereign credit rating/outlook data from the major credit rating agencies, including the Moody's, Standard & Poor and Fitch. We first converted the rating into a numerical score in which "AAA/Aaa" corresponds to 1, "AA+/Aa1" corresponds to 2, …, and "D" corresponds to 22. Then, for each country, the monthly average credit rating is calculated as our measure of a country's credit risk. The sample average rating for all countries is 10.1, which is equivalent to a "BBB+" rating.

For each country, we further obtain the daily U.S. dollar denominated total return of its major stock market index from Bloomberg (dividends included). For instance, we collect S&P 500 Index for US, Tokyo Stock Price Index for Japan and FTSE 100 Index for the United Kingdom. The complete list of countries and the stock market indices are provided in the appendix. As can be seen, the total number of stock indices reached to 75 by 2015. To be consistent with the CDS return data, we construct the monthly stock index return as the return from the 20th of a month to the 19th of the next month. Table 1 demonstrates that the average monthly stock index return is 1% with a standard deviation of 7.95%.

2.2 Export Destination risk information

In this section, we explore a country's export destination countries' sovereign CDS return to proxy for the underlying country's export demand risk increase. More specifically, we define an export destination risk proxy for each country as the weighted average of the export destination countries' CDS returns using the bilateral export in the prior calendar year from the underlying country as the weight,

$$ExRisk_{c,t} = \frac{\sum_{i \neq c} Export_{i,t^*(t)}^{c} Ret_{i,(t-F+1,t)}}{\sum_{i \neq c} Export_{i,t^*(t)}^{c}} \quad (1)$$

, where $ExRisk_{c,t}$ denotes the export destination risk information of country *c* at the end of month *t*, and $Export_{i,t^*(t)}^{c}$ denotes the dollar amount of export from country *c* to country *i* in the prior calendar year before month *t*. We use the prior calendar year export amount as the weight to make sure that the export data is accessible to investors at the time they need to calculate the proxy and build up their portfolio accordingly. $Ret_{i,(t-F+1,t)}$ is country *i*'s sovereign CDS return from month *t-F+1* to *t*, where *F* is referred to as the forming period of the proxy. In this paper, we use past three months CDS return (*F*=3) as the default setup, unless otherwise specified. We include all country *c*'s export destination countries which have sovereign CDS traded. For instance, assuming that country *c* exports to country *x* and *y* 100 billion dollars and 50 billion dollars in 2005 respectively. We calculate the export destination risk $ExRisk_{c,t}$ in month *t* in 2006 as

$$ExRisk_{c,t} = \frac{100 * Ret_{x,(t-2,t)} + 50 * Ret_{y,(t-2,t)}}{150}$$

where $Ret_{x,(t-2,t)}$ and $Ret_{y,(t-2,t)}$ are country *x* and *y*'s sovereign CDS returns from month *t-2* to *t*. We check the robustness and find that, on average, countries in our sample export 81% of their total export to countries, which have sovereign CDS traded (the median value is 82%), with a standard deviation of 13%. Therefore, the export destination risk proxy $ExRisk_{c,t}$ has a very good representativeness of the underlying country's export destination risk.

Our proxy measures the overall increase in the sovereign credit risk among a country's export destination countries. When a country's sovereign credit risk increases, its CDS spread will increase leading to a positive CDS return. Therefore, a high $ExRisk_{c,t}$ implies a significant increase in sovereign credit risk among country c's export destination countries at time *t*.

III. Return predictability

If the export destination countries' sovereign credit risk information is slowly incorporated into the exporting countries' CDS prices, then the export destination risk proxy $ExRisk_{c,t}$ should be able to predict the exporting country's CDS returns. In this section, we implement a portfolio approach to examine the predictive power of $ExRisk_{c,t}$.

3.1 Cross section portfolio return

By using the export destination risk proxy we introduced in the section 2, we create the following trading strategy. At the end of each month, we sort all the countries based on their computed export destination risk proxies with varying forming period *F* and divide the countries into five quintiles P1(low risk) to P5 (high risk). By going long on the countries in the quintile with the highest export destination country risk proxy (P5) and selling short the countries in the quintile with the lowest export destination risk proxy (P1), a zero-cost portfolio is formed. This strategy is essentially buying credit default protection for countries with higher export destination country risk increase, while writing default protection on countries with lower export destination risk increase. All the positions are unwound after *H* months of holding period and equally-weighted returns are computed for each portfolio (P1 to P5) and the long/short portfolio P5-P1.

Table 2 panel A reports the profits of our long/short strategy from January 2001 to September 2015 using various combination of formation periods F to calculate the export destination risk proxy $ExRisk_{c,t}$, and portfolio holding periods H. The return predictability is robust, as the long/short portfolio returns are significant for different combination of the forming periods and holding periods. As can be seen, our strategy generates the most significant results for forming period of 3 months and both the economic and statistical significance start to decline for forming period longer than 3 months. For instance, for forming period F=3 months and holding period H=1 month, our strategy generates a monthly return of 47 bps (5.76% on annual basis) with a t-statistic of 3.69 and Sharpe ratio of 1.10. In comparison, for forming period F=6 months and holding period H=1 month, the long/short strategy generates a monthly return of only 30 bps (or 3.6% on annual basis), with t-statistic of 2.62 and Sharpe ratio of 0.85. Given the fact that the forming period F=3 months and holding period H=1 month generates the largest monthly return in our panel, we will use F=3 and H=1 as the default setting in the rest of the discussion. The panel also reports that the average returns of portfolios P1 to P5 in the month immediately after the formation. As can be seen, the portfolio return increases monotonically, indicating the return predictability by the export destination risk proxy $ExRisk_{c,t}$.

In Table 2 Panel B, we further examine the robustness of the return predictability of our export destination risk proxy to risk factors. More specifically, we run time-series regressions of the monthly return generated by our long/short portfolio strategy (with F=3,H=1) controlling for various risk factors documented in the prior literature. In the first row of panel B, we do not control for any risk factor and report the raw return of the long/short strategy. In the second row, we control for the sovereign CDS momentum return with 3 month forming period and 1 month holding period as documented in Xiao, Yan and Zhang (2017). In the third row, the risk factor is the equal-weighted market average return of sovereign CDS. We combine the market return and the momentum return together in the fourth row and further include the global momentum and value factors documented in Asness, Moskowitz and Pedersen (2013) in the fifth row. As can be seen, after controlling for all four risk factors, in the fifth row, we still obtain 0.3% monthly abnormal return, with a t-statistic equals to 2.90. The risk adjusted return is significant both economically and statistically.

In Panel B of Table 2, we also present the return predictability during different time periods. We defined the Subprime Crisis period following the NBER definition. The pre-crisis period is from January 2001 to November 2007, while the crisis and post-crisis periods are from December 2007 to December 2010 and January 2011 to September 2015 respectively. The risk adjusted abnormal returns are all positive and statistically significant at the 5% level during the pre- and post-Crisis periods. The abnormal return becomes statistically insignificant (but still economically sizable) during the crisis period, possibly due to the excessive volatility and comovement of the sovereign CDS spreads, which cannot be justified by the economic foundations during the Crisis.

3.2 The long-horizon return

The predictive power of the export destination risk proxy shown above is consistent with an underreaction hypothesis that investors have failed to incorporate countries export destination sovereign credit risk information into the underlying countries' sovereign credit risk pricing in a timely fashion. Alternatively, in a competing hypothesis, it is also possible that the result is driven by investors' overreaction to information in the same spirit as has been discovered in the literature. For instance, Da, Engelberg and Gao (2001) find that higher searching volume in Google can predict a higher abnormal return of a stock in the next couple of weeks, but the return reverses back completely over a longer horizon. To separate these two competing hypothesis, we calculate the cumulative average return (CAR) of our long/short portfolio starting from 3 months before the formation of the portfolio (with the formation period F=3 months) to 24 months after and plot the results in Figure 2.

In Figure 2, the cumulative long/short portfolio return is about 2% before the formation of the long-short portfolio. Nevertheless, the long/short portfolio return keeps drifting in the same direction after the initial price response. The return drift lasts for about 15 months and generates an additional 2.4% cumulative return. The long/short portfolio return does not show any reversal pattern. These results lend support to our hypothesis that the sovereign CDS prices underreact to the export destination risk information.

3.3 The real impact

To substantiate the underreaction hypothesis, we further provide evidence that a country's export destination risk proxy $ExRisk_{c,t}$, indeed contains information about real economic activities directly relevant to a country's sovereign credit risk.

In this section, we use a panel data regression framework to explore the predicative power of the export destination risk proxy on real economic activity. Since export and GDP growth are both crucial in determining a country's ability to serve its external debt, if our export destination risk proxy can predict these two variables, it would imply that the proxy $ExRisk_{c,t}$ indeed contains information on a country's sovereign credit risk. We regress the export growth and GDP growth for year t+1 of countries in our sample on the export destination risk proxy for year t, which is calculated on the December of year t with a forming period F=12. We use the annul frequency data for this exercise in order to include all the countries in our sample as that most of the countries do not have higher frequency export growth or GDP growth data.

The columns (1)-(3) of Table 3 Panel A report the regression results for the export growth. The regressions control for a country's own lagged annual sovereign CDS return, $RetOwn_{c,t}$, and the lagged annual export growth $Export\ Growth_{c,t}$. A country's export growth is largely determined by its export destination countries' demand, which is affected by these countries' sovereign credit risk. Therefore, a high export destination risk proxy, which implies an increase in trading partners' sovereign credit risk, should predict low export growth. Column (1)

- (3) show that the coefficients of $ExRisk_{c,t}$ are indeed negative and statistically significant. All the right-hand variables in the regression have been normalized using their standard deviations. As can be seen that one standard deviation increase in the export destination risk will reduce the next year export growth by 1.09 percent after controlling for the lagged sovereign CDS return and lagged export growth. Therefore, the predictability of the export destination risk proxy, $ExRisk_{c,t}$, is not only statistically significant, but also economically important.

We further test the predictability of the export destination risk on GDP growth. Since export is a major component of a country's GDP, and trading partners' sovereign credit risk could predict the export growth as shown above, it is natural to expect that our export destination risk proxy could predict GDP growth. The regression results in the column (4)-(6) of Table III panel A confirm the predictability of the export destination risk proxy on GDP growth. The coefficient on $ExRisk_{c,t}$ is negative and statistically significant even after controlling for a country's own lagged annual sovereign CDS return, $RetOwn_{c,t}$, and the lagged annual GDP growth rate $GDP\ Growth_{c,t}$. A one standard deviation increase in the export destination risk leads to about 0.4 percent decline in a country's GDP growth in the following year. Given the predictability of $ExRisk_{c,t}$ on both export growth and GDP growth, if the CDS investors do not pay enough attention to countries' trading partners' sovereign credit risk information, our export destination risk proxy should be able to predict the sovereign CDS return.

In the panel B of table III, we conduct a similar panel regression test using the manufacturing Purchasing Manager Index (PMI) as the dependent variables. The benefit of using PMI is that they are the most available monthly frequency real economic activity measures and are widely used by investors as a real time barometer of economic activity. We use seasonality adjusted headline PMI, output PMI and export PMI as our regression variables. The headline PMI is a comprehensive economic activities measure covering firms' output, new orders, employment and etc.. The output PMI focuses on measuring firms' total output performance, while the export PMI measures firms' export situation. In the PMI tests, we regress the PMI indices of month t+1 on our export destination risk proxy, $ExRisk_{c,t}$, with three month formation period (F=3), controlling for the past 3-month cumulative sovereign CDS return of the underlying country (from t-2 to t), $RetOwn_{c,t}$, the market average CDS return in month t, $RetMkt_t$, and the past three months average Headline PMI, Output PMI and Export PMI respectively. The country and year fixed effects are both controlled and all the standard errors are clustered at the month level. All the control variables are normalized using their standard deviation. As can be seen, the coefficients on $ExRisk_t$ are all negative and statistically significant in the regressions for the headline, output and export PMI. A one standard deviation increase of our export destination risk proxy will reduce the Headline PMI by 0.6, the Output PMI by 0.7 and the Export PMI by 0.6, which are all economically significant. All these results indicate that the export destination risk proxy indeed contains information on a country's real economic activity.

3.4 Fama-MacBeth Regression

The above results provide evidence on CDS cross section return predictability and support the hypothesis that a country's sovereign CDS price reacts sluggishly to its export destination risk information. However, there are at least three competing hypotheses explaining the return predictability: (1) momentum (2) systemic risk factors (3) financial linkage. In this section, we will use the Fama-MacBeth regression framework to control and address these concerns.

In each month t, we run a cross section regression specified as follows

$$Ret_{c,t+1} = \alpha + \beta_1 ExRisk_{c,t} + \beta_2 Proxy_{c,t} + X'_{c,t}\gamma + \varepsilon_{c,t}$$

where $Ret_{c,t+1}$ is country c's sovereign CDS return in month t+1 and $ExRisk_{c,t}$ is the export destination risk proxy of country c in month t. The time series coefficients in the monthly regressions are averaged following the standard Fama-Macbeth approach and the standard errors are computed with a Newey-West correction with 12 lags. $X'_{c,t}$ contains a basic set of macro-variables controlling for country characteristics, including GDP growth, inflation and export-to-

GDP ratio. More importantly, we also control for other alternative hypothesis $Proxy_{c,t}$, which can potentially lead to the correlation between the export destination risk proxy $ExRisk_t$ and the sovereign CDS return in the next month.

3.4.A Sovereign CDS momentum effect

One competing interpretation of the return predictability is that the information flow is not from the export destination countries to the exporting country as argued in our interpretation, but is rather in the opposite direction, from the exporting country to its export destination due to some not obvious reasons. The export destination risk proxy $ExRisk_t$ could, therefore, be correlated with the exporting country's past CDS return. This correlation would lead to the return predictability of our proxy, due to the return predictability of the past CDS return documented in the sovereign CDS market momentum effect, Xiao, Yan and Zhang (2017). We have already partially addressed this concern in the prior sections by showing the existence of statistically significant abnormal return of the long/short portfolio strategy after controlling for the sovereign CDS momentum return. In this section, we provide further evidence that the predictability of the export destination risk proxy is different from the momentum effect using the Fama-MacBeth regression framework. All the variables in Table IV have been grouped into quintiles according to their magnitude.

Column (1) only includes the export destination risk proxy, $ExRisk_{c,t}$, and the basic set of control variables, while Column (2) adds the past 3-month sovereign CDS return $RetOwn_{c,t}$. Both $\mathrm{ExRisk}_{c,t}$ and $RetOwn_{c,t}$ are grouped into quintiles in the regression. As can be seen, the coefficients of the $ExRisk_{c,t}$ is still positive and statistically significant after controlling for the momentum effect. The coefficient on $ExRisk_{c,t}$ in Column (2) is 0.0631 with a *t*-statistic of 2.36, and the magnitude of the coefficient stays almost the same after controlling for the past sovereign CDS return $RetOwn_{c,t}$. This result proves that the predictability of the export destination risk proxy $ExRisk_{c,t}$ does not come from the momentum effect.

3.4.B Asymmetry between Export and Import Risk

Another hypothesis of the return predictability is that it is not coming from the bilateral trade channel, but rather some other non-trade channels. A country's important trading partners may have close geopolitical/economic similarities with the underlying country or expose to the same types of shock. Therefore, the trading partners' sovereign credit risk change may contain information about the underlying country's sovereign credit risk. To pin down this hypothesis, we introduce an import source risk proxy similar to the export destination risk proxy $ExRisk_{c,t}$. It is defined as the weighted average of a country's import source countries' CDS return, using the bilateral import amount (in dollar) of country *c* as the weight. Specifically, for country c, its import source risk in month *t* is calculated as follows.

$$ImRisk_{c,t} = \frac{\sum_{i \neq c} Import_{i,t^*(t)}^{c} Ret_{i,(t-F+1,t)}}{\sum_{i \neq c} Import_{i,t^*(t)}^{c}}$$

where $Import_{i,t^*(t)}^{c}$ is country c's import (in dollar) from country *i* in the calendar year before month *t* and $Ret_{i,(t-F+1,t)}$ is the sovereign CDS return of country *i* from month *t-F+1* to *t*, where *F* is referred to as the forming period similar in the definition of $ExRisk_{c,t}$. We set F=3 for both $ImRisk_{c,t}$ and $ExRisk_{c,t}$ in the following tests.

Since trade is bilateral, a country's export destination countries and the import source countries are usually the same group of countries. Therefore, the only difference between $ImRisk_{c,t}$ and $ExRisk_{c,t}$ is the weight on each trading partner country's CDS return. If the non-trade interpretation is correct, it is not obvious why the export destination risk proxy $ExRisk_{c,t}$ should have better predictive power than the import sources risk proxy $ImRisk_{c,t}$. In sharp contrast to this implication, our trade linkage interpretation clearly indicates the predictability asymmetry between $ExRisk_{c,t}$ and $ImRisk_{c,t}$. According to our hypothesis, $ExRisk_{c,t}$ should have much stronger predictive power than $ImRisk_{c,t}$, because a country's sovereign credit risk change is caused by changing external demand from its export destination countries, but has little to do with its importing source countries' credit risk. We run a horse race test between $ExRisk_{c,t}$ and $ImRisk_{c,t}$ in the Fama-MacBeth regression framework to identify which hypothesis can better explain the observation. In the regression, both $ExRisk_{c,t}$ and $ImRisk_{c,t}$ are grouped into quintiles. (The original continuous variables generate similar results). As shown in Table IV Column 3, the coefficient of $ExRisk_{c,t}$ is statistically significant while the coefficient of $ImRisk_{c,t}$is not. Moreover, the magnitude of $ExRisk_{c,t}$'s coefficient is 0.0868%, which is much bigger than $ImRisk_{c,t}$'s coefficient of -0.0349%. This asymmetric result lends support to our trade linkage hypothesis, implying that the return predictability is due to the export destination risk information.

3.4.C Trading linkage vs Financial linkage

Next, we consider a more subtle alternative interpretation, the financial linkage between countries. The trade linkage between two countries is often accompanied by financial linkages. For instance, the US is both China's major export destination country and China's capital inflow source country. A major shock in the US economy could affect China through both reduced import and capital inflow. Therefore, the observed return predictability of the export destination risk could be driven by capital flow through financial linkage rather than by export through trade linkage. The bilateral capital flow is composed of both FDI, which is the long term equity investment, and the portfolio investment, which include both debt and speculative equity investment. To measure the FDI flow risk, we define inward FDI risk proxy $RetFDI\_inward_{c,t}$ and outward FDI risk proxy $RetFDI\_outward_{c,t}$ as follows.

$$FDI\_inward_{c,t} = \frac{\sum_{i \neq c} FDI\_inward^{c}_{i,t^*(t)} Ret_{i,(t-F+1,t)}}{\sum_{i \neq c} FDI\_inward^{c}_{i,t^*(t)}}$$

$$FDI\_outward_{c,t} = \frac{\sum_{i \neq c} FDI\_outward^{c}_{i,t^*(t)} Ret_{i,(t-F+1,t)}}{\sum_{i \neq c} FDI\_outward^{c}_{i,t^*(t)}}$$

where $Ret_{i,(t-F+1,t)}$ is country *i*'s sovereign CDS return from month *t-F+1 to t* and $FDI\_inward^{c}_{i,t^*(t)}$ ($FDI\_outward^{c}_{i,t^*(t)}$) is country *c*'s inward (outward) FDI from (to) country *i* by the end of the calendar year prior to month *t*.

Similarly, to measure the portfolio investment risk, we define inward portfolio investment risk proxy $RetPI\_inward_{c,t}$ and outward portfolio investment risk proxy $PI\_outward_{c,t}$ as follows.

$$PI\_inward_{c,t} = \frac{\sum_{i\neq c} PI\_inward^{c}_{i,t^*(t)} Ret_{i,(t-F+1,t)}}{\sum_{i\neq c} PI\_inward^{c}_{i,t^*(t)}}$$

$$PI\_outward_{c,t} = \frac{\sum_{i\neq c} PI\_outward^{c}_{i,t^*(t)} Ret_{i,(t-F+1,t)}}{\sum_{i\neq c} PI\_outward^{c}_{i,t^*(t)}}$$

where $Ret_{i,(t-F+1,t)}$ is country *i*'s sovereign CDS return from month *t-F+1 to t* and $PI\_inward^{c}_{i,t^*(t)}$ ($PI\_outward^{c}_{i,t^*(t)}$) is country *c*'s inward(outward) portfolio investment from (to) country *i* by the end of the calendar year prior to month *t*.

The definitions of the inward/outward FDI risk and the inward/outward portfolio investment risk are quite similar to the definition of the export/import risk proxies $ExRisk_t$ and $ImRisk_t$, except for using the FDI or portfolio investment rather than the trade volume as weight. We run horse race tests among$ExRisk_{c,t}$, $FDI\_inward_{c,t}$ ($FDI\_outward_{c,t}$) and $PI\_inward_{c,t}$ ($PI\_outward_{c,t}$) in a Fama-MacBeth regression framework. All the above variables are grouped into quintiles. In the regression of column (4) and (5), we find that only the coefficient on the export destination risk $ExRisk_{c,t}$ is statistically significant. All these results imply that the return predictability of our export destination risk proxy indeed comes from the trade linkage rather than the financial linkage.

IV. Underlying Mechanism

Having established the return predictability by the export destination risk proxy, we further explore the mechanism affecting the information incorporation process. In this section, we explore whether the predictability in return is driven by investors' inattention. We study factors affecting the incorporation speed of the export destination risk information through testing the magnitude of the return predictability of the export destination risk proxy.

4.1 A Sovereign credit rating and investor inattention

We begin by examining the role of credit rating/outlook change in the transmission of the export destination risk information. Sovereign credit rating/outlook changes are major events, and usually attract extensive report among international mass media. For instance, the recent sovereign credit downgrade of South Africa's long-term foreign currency credit from BBB+ to BB- by the Standard & Poors on April 3, 2017 led to extensive report among mainstream news media including Economist, Financial Times, Wall Street Journal, NBC news and etc.. A large amount of news coverage increases the visibility of foreign news events and attracts investors' attention. When analyzing a country's sovereign credit risk, if many of its export destination countries experience credit rating change recently, it is more likely that investors would pay attention to the export destination risk and react more quickly. If the return predictability is indeed driven by investors' attention, we would expect that countries in periods with more of their export destination countries' credit rating/outlook being changed would exhibit less severe delay of their export destination risk information, and thus weaker return predictability. To exam this prediction, we design the following panel regression test.

For exporting country c in month *t*, we calculate the total number of long-term foreign currency credit rating/outlook changes among c's export destination countries during the past three months from *t-2* to *t*, and denote it as $Rating\_chg_{c,t}$. Since more credit rating/outlook changes lead to more news coverage and attract more attention from the investment society, we count all outlook and credit rating changes by Moody's, Fitch and Standard & Poor in $Rating\_chg_{c,t}$. For instance, if a country's rating is being changed by both Moody's and Fitch in the past three months, both changes are counted. For robustness, we also tried to count the rating/outlook change only once even if more than one rating agencies adjust their rating/outlook during the 3-month window and the result is similar. We run the following panel regression.

$$Ret_{c,t+1} = \alpha + \beta_1 D_{c,t}^{1,5} + \beta_2 D_{c,t}^{1,5} * Rating\_chg_{c,t} + \beta_3 Rating\_chg_{c,t} + Controls_t + \varepsilon_{c,t}$$

where $D_{c,t}^{1,5}$ is a dummy variable, which is set to be 1 if country c is in the quintile P5 (the highest export destination risk) according to the sort based on the export destination risk proxy $ExRisk_{c,t}$ (F=3). It is set to -1, if country c is in quintile 1 (the lowest export destination risk) and is set to 0 if country c is in the rest three quintiles. The control variables include country c's past three months cumulative CDS return, the CPI inflation, GDP growth rate and the export-to-GDP ratio. The country and month fixed effect are also controlled and the standard error has been clustered at the month level.

Given the return predictability of the export destination risk proxy $ExRisk_{c,t}$, it would be natural to expect that the coefficient of $D_{c,t}^{1,5}$ to be positive and statistically significant. Moreover, the investor limited attention hypothesis implies that the coefficient of the interaction term $D_{c,t}^{1,5}$ *$Rating\_chg_{c,t}$ should be negative, that is, the export destination risk proxy will have *weaker* return predictability for countries with more of their export destination countries experience credit rating/outlook changes in the past three months. The result of the test is reported in table V column (1) and (2). The coefficient on $D_{c,t}^{1,5}$ is indeed positive and statistically significant as expected. Moreover, the coefficient on the interaction term $D_{c,t}^{1,5} * Rating\_chg_{c,t}$ is -0.007 and statistically significant. Given that the standard deviation of $Rating\_chg_{c,(t-2,t)}$ is 11.6, a one standard deviation increase in the number of export destination countries with credit rating/outlook change during the past three months would reduce the predicative power of $D_{c,t}^{1,5}$ by $-0.007 * 11.6 = -0.0812$, which is about 23 percent of the coefficient of $D_{c,t}^{1,5}$ in column (1)(2). All these results show that investor attention is both statistically and economically significant in determining the return predictability of our export destination risk proxy. The difference between column (1) and (2) is only that the standard errors are clustered on country in column (1) but on month in column (2). The coefficients of $D_{c,t}^{1,5} * Rating\_chg_{c,t}$ in column (1) and (2) are both significant, indicating the robustness of our result.

The above evidence lends support to the investor inattention hypothesis, by showing that the return predictability is weaker when the investors are most likely to pay attention to the export destination risk. In the next section, we further explore the asymmetry of investor's attention.

4.2 The asymmetry between "good news" and "bad news"

There is a growing body of work suggesting that people's responses to positive and negative information are asymmetric—that negative information has a much greater impact on individuals' attitude than positive information. For instance, by using time-series analyses of U.K. media and public opinion data, Soroka (2006) discovered strong asymmetries in mass media responsiveness to positive and negative economic shifts and in public responsiveness. It is also possible that investors' pay more attention to negative credit rating change due to the fact that negative credit rating change may lead to mandatory behavior of certain institutional investors causing much more significant market impact. Hull et. at (2004) and Xiao, Yan and Zhang (2017) both document that the CDS market responses stronger to negative credit rating changes than to positive changes. If the sovereign credit downgrade draws more attention from investors than upgrade, the export destination risk information should be incorporated into the exporting country's CDS price faster, if more export destination countries went through the sovereign credit downgrade.

To test this asymmetric response hypothesis, we further decompose the indicator $D_{c,t}^{1,5}$ into two variables, $D_{c,t}^{Good}$ and $D_{c,t}^{Bad}$. $D_{c,t}^{Good}$ is -1, if country c is in the quintile P1 according to the sort based on the export destination risk proxy, $ExRisk_{c,t}$ (i.e. countries c is with the lowest export destination risk increase), and is 0 otherwise. Similarly, $D_{c,t}^{Bad}$ is 1 if country i is in the highest export destination risk quintile P5, and is 0 otherwise. Therefore, $D_{c,t}^{1,5} = D_{c,t}^{Good} + D_{c,t}^{bad}$. We then run the following panel regression of sovereign CDS return.

$$\begin{aligned} Ret_{c,t+1} = \alpha + \beta_1 D_{c,t}^{Good} \\ + \beta_2 D_{c,t}^{Good} * Rating\_chg_{c,t} + \beta_3 D_{c,t}^{Bad} + \beta_4 D_{c,t}^{Bad} * Rating\_chg_{c,t} \\ + \beta_5 Rating\_chg_{c,t} + Controls_t + \varepsilon_{c,t} \end{aligned}$$

Our hypothesis of investors' asymmetric response to good news and bad news would imply that the magnitude of coefficient for $D_{c,t}^{Bad} * Rating\_chg_{c,t}$ should be larger and more significant than that for $D_{c,t}^{good} * Rating\_chg_{c,t}$, as bad credit information would draw more attention, thereby reducing the return predictability more significantly.

The column (3)(4) of Table V report the regression results (with the standard errors clustered on country in column (3) and on time in column (4)). The coefficients of $D_{c,t}^{good}$and $D_{c,t}^{Bad}$ are both positive, indicating the return predictability of these two dummies as expected. The negative sign of both $D_{c,t}^{Bad} * Rating\_chg_{c,t}$ and $D_{c,t}^{Good} * Rating\_chg_{c,t}$'s coefficients demonstrates the predictability declination with the number of export destination countries' credit rating/outlook change under both the "good news" and "bad news" scenarios. However, only the coefficient of $D_{c,t}^{Bad} * Rating\_chg_{c,t}$ is statistically significant with the magnitude of $D_{c,t}^{Bad} * Rating\_chg_{c,t}$'s coefficient more than 2 times the coefficient of $D_{c,t}^{Good} * Rating\_chg_{c,t}$, which lends strong support to our asymmetric attention hypothesis.

In summary, our results show that the predictive power of the export destination risk declines with more export destination countries experiencing credit rating/outlook changes. The decline of the predictability is more significant when the export destination countries undergo negative rating/outlook changes. These results are consistent with investor limited attention hypothesis. Credit rating/outlook changes attract investor attention, which makes the export destination risk information more rapidly incorporated into the CDS price, thereby reducing the CDS return predictability. Moreover, since the negative credit rating/outlook information attracts more attention than that of the positive credit rating/outlook information, the predictive power reduction is more significant under the "bad credit news" scenario than under the "good credit news" scenario.

4.3 The indirect trade linkage

If investors have limited attention on a country's direct export destination risk, and hence absorb this information with a delay, it would be even more difficult for investors to recognize the indirect export destination risk information and response to it instantly. For example, China is Australia's major export destination country, while the U.S. is the biggest export destination for China. A sovereign credit risk shock in U.S., such as the 2008 Subprime Crisis, caused a significant contraction of the US import from China, which dampened China's economic growth and reduced China's import of raw materials from Australia, drove up the sovereign credit risk of Australia. Therefore, China provides a channel through which the US sovereign credit risk shock spread to Australia. We refer to the risk associated with this type of indirect trade linkage as the indirect export destination risk. To measure a country's total indirect export destination risk, we first construct a direct export matrix R, with the term in row i and column j, $R_{i,j}$, being the ratio of country i's export to country j over country i's total export to all the countries in the sample. The summation of all the terms in a row is, therefore, equal to 1. By multiplying the direct export destination matrix R with the sovereign CDS return vector (where the ith term is country i's past three months sovereign CDS return), we generate the export destination risk vector with the c's term being country c's export destination risk proxy $ExRisk_{c,t}$. By further multiplying the matrix R with the calculated export destination risk vector, we generate the indirect export destination risk vector, with the c's term being country c's indirect export destination risk proxy, $ExRisk\_Indirect_{c,t}$.

To capture the dynamics of information incorporation through the direct and indirect channels, we run a Fama-MacBeth regression with the following specification:

$$Ret_{c,t+h} = \alpha + \beta_1 ExRisk_{c,t} + \beta_2 ExRisk\_Indirect_{c,t} + Controls + \varepsilon_{c,t}$$

The dependent variable is the weekly sovereign CDS return in week t+h, where t is the sorting week and the $Ret_{c,t+h}$ is country c's h weeks ahead sovereign CDS weekly return. $ExRisk_{c,t}$ and $ExRisk\_Indirect_{c,t}$ are calculated by using the past 12 weeks cumulative sovereign CDS returns and are both grouped into quintiles. The control variables include countries' own CDS return in the past 12 weeks, the lagged monthly inflation, the annual GDP growth rate and the export-to-GDP ratio in the last calendar year.

The regression results are shown in Table VI. As can be seen, in the first and second weeks after the sorting week (h=1,2), the magnitude of the coefficients of $ExRisk_{c,t}$ is larger than that of the $ExRisk\_Indirect_{c,t}$. And only the coefficient of $ExRisk_{c,t}$ is statistically significant. Moreover, the difference between the coefficient of $ExRisk_{c,t}$ and $ExRisk\_Indirect_{c,t}$ is statistically significant. In the third and fourth weeks, the magnitude of the coefficients on $ExRisk\_Indirect_{c,t}$ picks up and becomes statistically significant. The regression results show that investors respond more rapidly to the direct export destination risk information than to the indirect export destination risk information. This finding lends support to the idea that the complexity of the information plays an important role in investors' information processing.

4.4 Other measures of investors' attention

This section provides evidence showing that other commonly used measures of investors' attention also affect the magnitude of the return predictability. We focus on exporting countries' CDS liquidity and the centrality measure of the exporting countries in the global trade network. We conduct Fama-MacBeth regression by adding an interaction term between the export destination risk proxy $ExRisk_{c,t}$ and the attention proxy $Proxy_{c,t}$:

$$Ret_{c,t+1} = \alpha + \beta_1 ExRisk_{c,t} + \beta_2 Proxy_{c,t} + \beta_3 ExRisk_{c,t} * Proxy_{c,t} + X'_{c,t}\gamma + \varepsilon_{c,t}$$

where $X'_{c,t}$ is the set of common control variables including country c's past three months sovereign CDS return, the CPI inflation, the GDP growth rate and the export-to-GDP ratio. $ExRisk_{c,t}$ is grouped into quintile in the regression and the results are reported in Table VI.

A. Liquidity

Countries with less liquid sovereign CDS trading are usually countries, which investors pay less attention to. This, according to our hypothesis, makes the export destination risk information less likely being incorporated into the sovereign CDS price instantly. In other words, the return predictability should be stronger for countries with lower sovereign CDS liquidity. Following the prior literature, e.g. Qiu and Yu (2012), we use the number of dealers as a proxy for sovereign CDS liquidity. We calculate a monthly liquidity measure $Liquidity_{c,t}$ for country c and month t, which is equal to one for countries with the number of dealers above the median of the sample in the month, and is zero otherwise. We use the export destination risk variable $ExRisk_{c,t}$ to interact with $Liquidity_{c,t}$ and report the results in column (1)(2) of Table VI. As can be seen, the coefficients on the cross term are both negative and statistically significant no matter controlling for other momentum and macro variables or not, which is consistent with the hypothesis that the CDS prices of high liquidity countries adjust more quickly to the corresponding export destination risk information.

B. Centrality

Countries, which are more central in the global trade network, such as Singapore, Hongkong, China, United States, United Kingdom and etc, are more likely to draw investors' attention on their export destination risk. In other words, high "centrality" countries in the trade network should have weaker CDS return predictability according to our limited attention hypothesis. In this section, we calculate a country's "centrality" applying the most widely used eigen-centrality measure in the network analysis, e.g. Allen and Babus (2008), Acemoglu, Ozdaglar and Tahbaz-Salehi (2010, 2013). The eigen-centrality measure, $Centrality_{c,t}$, for country c and month t, is the corresponding eigenvalue calculated by applying the standard eigenvalue decomposition on the export destination matrix R_t in month t similar to Richmond (2016). We use the export destination risk variable $ExRisk_{c,t}$ to interact with the centrality measure $Centrality_{c,t}$ and report the results in the column (3)(4) of Table VI. As can be seen, the coefficients of the cross term are both negative and statistically significant controlling for other momentum and macro variables or not, indicating that CDS spreads of high network centrality countries adjust more quickly to their export destination risk information. This result is in line with investors' limited attention.

V. Spillover from sovereign CDS market to the stock market

An important remaining question is whether the export destination risk information spills over from the sovereign CDS market to the stock market? Since the stock market has more investors than the sovereign CDS market, especially more domestic investors, it is possible that the stock market is more informative. To explore this question, we have collected major stock market index total return around the world.

To test the cross market predictability, we create a long-short portfolio in the stock market. In this strategy, we sort countries into quintiles according to their past three-month export destination risk proxy $ExRisk_{c,t}$ at the end of each month. We then go long on the stock indices of countries in the quintile with the lowest $ExRisk_{c,t}$ P1 (countries with the lowest sovereign credit risk increase), and sell short stock indices of countries in the quintile with the highest $ExRisk_{c,t}$ P5 (countries with the highest sovereign credit risk increase) and hold the portfolio for one month. In the first row of Table VII Panel A, we report the average return of the stock indices in each quintile and the long-short portfolio P1-P5. As can been seen, the long-short portfolio generates a monthly return of 0.99%, with a t-statistic of 3.26 and a Sharpe ratio of 0.95. Moreover, the monthly stock index return declines monotonically from portfolio P1 to P5, indicating the stock index return predictability by our export destination risk proxy $ExRisk_{c,t}$.

To test the robustness, we further report the abnormal return of the portfolio P1 to P5 and the long-short portfolio P1-P5 after controlling for various combinations of the risk factors in the stock market. In the second row of Table VII panel A, we control for the stock index momentum return with 3 month forming period and 1 month holding period. In the third row, we control for the equal-weighted average return of stock indices. We combine the market average return and the momentum return together in the fourth row and further control for the global momentum and value factors documented by Asness, Moskowitz and Pedersen (2013) in the fifth row. As can be seen, the abnormal returns are all statistically significant under the four different specifications. For instance, we still obtain an abnormal return of 1.05% even after controlling for all four risk factors, with a t-statistic equals to 3.74. This result lends support to our argument that stock markets incorporate the export destination risk information sluggishly, which is similar to the sovereign CDS market.

Another question we explore is whether export destination countries' stock market index returns can better predict the exporting countries' stock index return. Given the fact that stock market aggregates information on a country's economic performance, it is possible that a stock index return based proxy of the export destination risk is better than the sovereign CDS based proxy. Following the construction of $ExRisk_{c,t}$, we introduce the following stock market based export destination risk measure.

$$ExRisk_{c,t}^{Stock} = \frac{\sum_{i \neq c} Export_{i,\,t^*(t)}^{c} Ret_{i,(t-F+1,t)}^{Stock}}{\sum_{i \neq c} Export_{i,\,t^*(t)}^{c}}$$

where $Ret_{i,(t-F+1,t)}^{Stock}$ is country i's stock index return in the past F months from t-F+1 to t and $Export_{i,\,t^*(t)}^{c}$ is the export from country c to country i in the calendar year before the month t. We put the sovereign CDS based measure $ExRisk_{c,t}$ and the stock market based measure

$ExRisk_{c,t}^{Stock}$ together in a Fama-MacBeth regression framework to test whether the stock market return based proxy is more informative. In this regression, we use the quintile group of $ExRisk_{c,t}^{Stock}$ and $ExRisk_{c,t}$ as before. The results are reported in the Panel B of Table VII. In column (1), we show the return predictability of $ExRisk_{c,t}$ on the stock index return, which is consistent with the above long/short portfolio approach. In column (2), we run a horse race test between $ExRisk_{c,t}^{Stock}$ and $ExRisk_{c,t}$ and find that the coefficient of $ExRisk_{c,t}$ is still negative and statistically significant, while the coefficient of $ExRisk_{c,t}^{Stock}$ is not statistically significant, indicating that the sovereign CDS based export destination risk proxy contains more information than the stock market proxy. In column (3)(4), we further include the past three months stock market cumulative return to control for the stock market momentum effect and the macroeconomic variables including the CPI inflation, GDP growth and the export-to-GDP ratio respectively to test the robustness of the result. In these two regressions, the coefficients of $ExRisk_{c,t}$ are still negative and statistically significant, while the coefficients of $ExRisk_{c,t}^{Stock}$ remain statistically insignificant.

VI. Conclusion

In this paper, we have shown the predictability of the export destination risk in the sovereign CDS market. The predictive power is above and beyond the risk factors documented in the prior literature. We also show that the predictability stems from investors' under reaction to a country's trading partners' sovereign credit risk information. We further demonstrate that investors' limited attention is the reason behind this slow price movement. Finally, we demonstrate that the export destination risk information in the sovereign CDS market can also be used to predict the stock index return.

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Figure 1 Average Export-to-GDP Ratio (2001-2015)

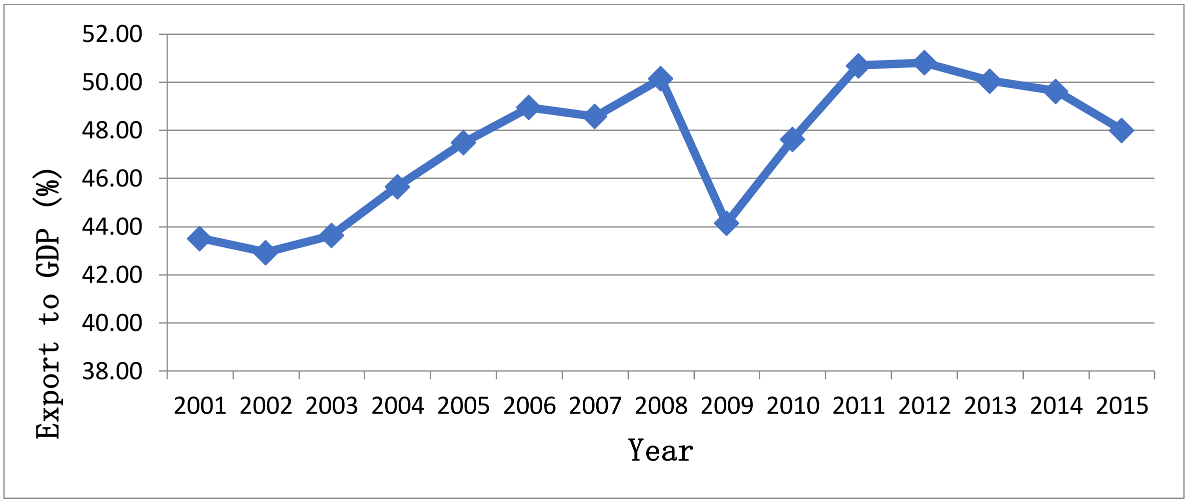

Figure 2 Cumulative return of the long-short portfolio sorted on export destination risk information proxy

This figure shows the cumulative returns of the long-short portfolio from 3 months before the portfolio is formed to 24 months after the portfolio's formation. At the end of month 0, countries are sorted into quintile portfolios based on their export destination risk information proxies. The proxy is calculated as the weighted average of a country's export destination countries' past 3 months sovereign CDS returns. The weight is the bilateral export from the underlying country to its export destination countries in the last calendar year. The figure shows the cumulative return over time of a zero-cost portfolio going long on the sovereign CDS in the highest risk quintile (group 5) and selling short the sovereign CDS in the lowest risk quintile (group 1).

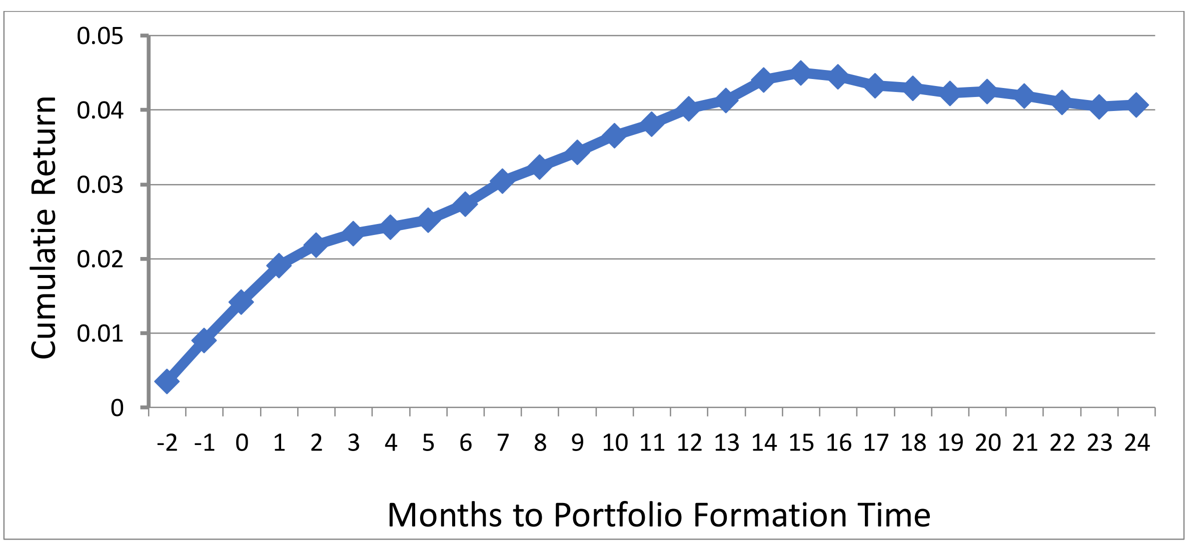

Table I: Summary Statistics

This table provides summary statistics of the variables used in the test. Panel A reports the number of the trading partner countries for each country. In Panel B, the sovereign CDS data is from January 2001 to September 2015. CDS spread is the par spread provided by the Markit Inc. The monthly CDS return is calculated using the standard CDS P&L model following O'Kane (2008). We compute the monthly CDS return using the CDS spreads on the 20th of a month and on the 19th of the next month. The stock index return is the monthly US-dollar denominated stock index total return from Bloomberg. In consistent with the CDS monthly return, the monthly stock index return is from the 20th of a month to the 19th of the next month. The annual international trade data is from UN-COMTRADE database from 2000 to 2015. Credit rating and credit outlook data contain all the sovereign credit rating information from S&P, Fitch and Moody's. The rating letter grades are converted to numerical value. Credit Rating is the monthly average of the numerical credit rating score of S&P, Fitch, and Moody's. The monthly inflation is calculated month over month by using the seasonality adjusted CPI index.

Panel A: Country Coverage					
	Mean	Std. Dev.	Min	Median	Max
Number of Export Destination Countries	77.87	14.08	9	84	88
Number of Import Source Countries	75.51	13.27	9	80	88

Panel B: Summary Statistics					
	Mean	Std. Dev.	25%	50%	75%
CDS spread (bps)	240.4	556.7	36.4	118.8	276.2
CDS return (%)	-0.02	2.59	-0.37	-0.01	0.22
Number of Dealers	5.9	3.2	3.1	5.4	7.9
Total Export to GDP ratio (%)	47.5	32.3	28.1	39.5	57.1
Monthly Inflation (%)	0.37	0.8	0.045	0.259	0.553
Annual GDP Growth (%)	3.66	4.32	1.66	3.61	5.63
Headline PMI	51.3	4.9	49.0	51.7	54.2
Credit Rating	10.06	4.81	6.5	10	14
Stock index return (%)	1.00	7.95	-3.00	1.12	5.16

Table II: Predictability by export destination country risk proxy (2001-2015)

This table presents the sovereign CDS portfolio return results. At the end of each month, sovereign CDS are sorted into five quintile portfolios (P1 to P5) based on their export destination risk proxy. The export destination risk proxy is calculated as the weighted average of the export destination countries' CDS returns during the past *F* months, using the prior calendar year's bilateral export as the weight. All countries are equally weighted within a given portfolio and the portfolios are held for *H* months. The long/short strategy is constructed by going long the countries in quintile P5 and selling short countries in quintile P1. Panel A contains equally-weighted returns of each portfolio as well as the long/short strategy. The Sharpe ratio is computed as the mean return divided by the standard deviation of returns. Panel B reports the robustness of long/short portfolio return to common risk factors with the formation period F=3m and the holding period H=1m. The same analysis is repeated by dividing the sample period into the Pre-Crisis (Jan 2001-Nov 2007), Crisis (Dec 2007-Dec 2010) and post-Crisis (Jan 2011-Sep 2015) periods following the NBER definition. In the first row of panel B, the raw return is reported. The sovereign CDS momentum return with 3 month forming period and 1 month holding period is controlled in the second row. In the third row, the risk factor is the equal-weighted market average return of sovereign CDS. The market return and the momentum return are combined in the fourth row and the global momentum and value factors (Asness, Moskowitz and Pedersen, 2013) are further added in the fifth row. The corresponding alphas are reported in the table. The 12-lag Newey-West t-statistics is provided in parenthesis, and *, **, and *** are indicators of statistical significance at the 10%, 5%, and 1% levels, respectively.

Panel A: Portfolio CDS returns

	Portfolio returns in the month following formation					Holding Period Returns		
	P1	P2	P3	P4	P5	Long/Short Strategy (P5 – P1)		
						H=1m	H=3m	H=6m
F=1m	-0.0005	-0.0008	-0.0002	-0.0001	0.0015	0.0020**	0.0024***	0.0013**
	(-0.43)	(-0.81)	(-0.25)	(-0.11)	(1.01)	(2.00)	(3.66)	(2.24)
Sharpe Ratio						0.45	0.85	0.77
F=3m	-0.0024*	-0.0002	-0.0003	0.0003	0.0023*	0.0047***	0.0030***	0.0020**
	(-1.80)	(-0.23)	(-0.29)	(0.38)	(1.69)	(3.69)	(2.84)	(2.11)
Sharpe Ratio						1.10	0.87	0.81
F=6m	-0.0021	-0.0003	-0.0005	0.0003	0.0009	0.0030***	0.0025**	0.0019*
	(-1.34)	(-0.31)	(-0.66)	(0.30)	(0.67)	(2.62)	(2.33)	(2.05)
Sharpe Ratio						0.85	0.82	0.79

	Panel B: Controlling for Risk Factors								
	Quintile Portfolio Returns					Long/Short Strategy (P5 – P1)			
	P1	P2	P3	P4	P5	Full Sample	Pre-Crisis 01/01-11/07	Crisis 12/07-12/10	Post-Crisis 1/11-9/15
(1)	-0.0024*	-0.0002	-0.0003	-0.0003	0.0023*	0.0047***	0.0063***	0.0036**	0.0034**
	(-1.80)	(-0.23)	(-0.29)	(-0.38)	(1.69)	(3.69)	(2.74)	(2.38)	(2.04)
(2)	-0.0026**	-0.0009	-0.0012*	-0.0011*	0.0001	0.0027***	0.0031**	0.0011	0.0025**
	(-2.42)	(-1.43)	(-1.94)	(-1.75)	(0.07)	(3.16)	(2.27)	(0.71)	(2.54)
(3)	-0.0024***	-0.0001	-0.0002	-0.0003	0.0024***	0.0048***	0.0067***	0.0034	0.0034**
	(-3.08)	(-0.42)	(-0.55)	(-0.60)	(3.38)	(3.56)	(2.85)	(1.42)	(2.06)
(4)	-0.0014**	0.0001	-0.0003	-0.0002	0.0014***	0.0028***	0.0032*	0.0014	0.0025**
	(-2.41)	(0.15)	(-0.82)	(-0.49)	(3.28)	(3.08)	(1.92)	(0.89)	(2.48)
(5)	-0.0010*	-0.0000	-0.0003	-0.0003	0.0014***	0.0024***	0.0025**	0.0016	0.0031***
	(-1.87)	(-0.09)	(-1.08)	(-0.86)	(3.38)	(2.90)	(2.10)	(0.97)	(2.78)

Table III: Real effects of the export destination risk proxy

This table reports the results of OLS predictive regressions of the real economic variables on the constructed lagged export destination risk proxy. In Panel A, the dependent variable is the yearly export growth rate and GDP growth rate. The $ExRisk_{c,t}$ is the weighted average of country c's export destination country annual CDS return in year t, using the annual export volume in year t-1 as the weight. $RetOwn_{c,t}$ is the annual CDS return of the exporting country. In Panel B, the dependent variables are the monthly headline, output and export PMI index from the Markit Inc. Among the independent variables, $ExRisk_{c,t}$ is the weighted average CDS return of country c's export destination countries during the past 3 months, using c's export in prior calendar year as the weight. $RetOwn_{c,t}$ is the past 3 months CDS return of the exporting country c from month t-2 to t. $RetMkt_t$ is the market average sovereign CDS return in month t. $Avg(Headline_{c,(t-2,t)})$, $Avg(Output_{c,(t-2,t)})$ and $Avg(Export_{c,(t-2,t)})$ are country c's average PMI indices during the past three months from month t-2 to t. All the independent variables in the Panel A and B are normalized using their standard deviation. Both country fixed effect and year fixed effect are controlled. Robust standard errors are clustered by month. and *, **, and *** are indicators of statistical significance at the 10%, 5%, and 1% levels, respectively.

Panel A: Future Export Growth and GDP Growth						
	Export Growth$_{c,t+1}$ (in %)			*GDP Growth*$_{c,t+1}$ (in %)		
$ExRisk_{c,t}$	-1.13**	-1.09**	-1.09**	-0.4716***	-0.4293***	-0.4284***
	[-2.01]	[-2.04]	[-2.14]	[-4.87]	[-5.07]	[-4.74]
$RetOwn_{c,t}$		-0.36	-0.45		-0.4467**	-0.4362**
		[-0.52]	[-0.58]		[-2.57]	[-2.56]
Export Growth$_{c,t}$			-0.323***			
			[-2.86]			
GDP Growth$_{c,t}$						0.4499
						[0.70]
Country FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Cluster by Year	Yes	Yes	Yes	Yes	Yes	Yes
No. Obs.	1,232	1,323	1,232	1,144	1,144	1,005
Adj. R2	0.51	0.51	0.51	0.21	0.22	0.27

Panel B: PMI regression			
	$Headline_{c,t+1}$	$Output_{c,t+1}$	$Export_{c,t+1}$
$ExRisk_{c,t}$	-0.5566***	-0.7283***	-0.6377***
	[-2.89]	[-2.65]	[-3.04]
$RetOwn_{c,t}$	-0.0872	-0.1992**	-0.0249
	[-1.58]	[-2.05]	[-0.34]
$RetMkt_t$	-0.3844**	-0.5422**	-0.5236**
	[-2.53]	[-2.50]	[-2.56]
$Avg(Headline_{c,(t-2,t)})$	4.0149***		
	[39.94]		
$Avg(Output_{c,(t-2,t)})$		4.6026***	
		[34.22]	
$Avg(Export_{c,(t-2,t)})$			3.9852***
			[28.63]
Country FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Cluster by Month	Yes	Yes	Yes
No. Obs.	3,985	3,985	3,592
Adj. R^2	0.79	0.71	0.71

Table IV: The Fama-MacBeth regressions of return predictability by export destination risk

This table reports the results for Fama-MacBeth regressions of monthly CDS return for the period 2001-2015. The variable $ExRisk_{c,t}$ is the weighted average CDS return of country c' export destination countries during the past 3 months, using the prior calendar year export volume as the weight. $RetOwn_{c,t}$ is the past 3 months CDS return of the exporting country. $ImRisk_{c,t}$ is the weighted average past 3 months CDS returns of country c's importing source countries (using the bilateral import of country *c* as the weights). $FDI\_inward_{c,t}$ ($FDI\_outward_{c,t,}$) is the weighted average past 3 months CDS return of country *c*'s FDI source (destination) countries, using the inward (outward) FDI by the end of the prior calendar year as the weight. $PI\_inward_{c,t}$ ($PI\_outward_{c,t}$) is the weighted average past 3 months CDS return of country *c*'s inward (outward) portfolio investment countries, using the inward (outward) portfolio investment by the end of the prior calendar year as the weight. All these independent variables are grouped into quintiles. Other controls that are included in each specification but are not reported include: lagged seasonally adjusted month over month *Inflation*, the lagged annual GDP growth rate and *the lagged* annual export to GDP ratio. The standard errors are computed with a Newey-West correction with 12 lags. Fama-MacBeth t-statistics are reported within parentheses, and *, **, and *** are indicators of statistical significance at the 10%, 5%, and 1% levels, respectively.

	Sovereign CDS return $Ret_{c,t+1}$ (%)				
	(1)	(2)	(3)	(4)	(5)
$ExRisk_{c,t}$	0.0713***	0.0361**	0.0480**	0.0578***	0.0416**
	[4.42]	[2.44]	[2.17]	[2.93]	[2.04]
$RetOwn_{c,t}$		7.5454**	8.2197**	5.3920*	5.4711*
		[2.35]	[2.44]	[1.93]	[1.85]
$ImRisk_{c,t}$			-0.0266	0.0031	-0.0168
			[-1.39]	[0.16]	[-0.91]
$FDI\_inward_{c,t}$				-0.0277	-0.0254
				[-1.08]	[-1.14]
$FDI\_ourward_{c,t}$				-0.0098	-0.0027
				[-0.56]	[-0.09]
$PI\_inward_{c,t}$					0.0364
					[1.16]
$PI\_outward_{c,t}$					-0.0152
					[-0.85]
Controls	YES	YES	YES	YES	YES
No. Obs.	173	172	172	132	132
Adj. R^2	0.18	0.33	0.35	0.35	0.45

Table V: Return predictability, attention, and credit rating

This table reports results from panel regressions of weekly sovereign CDS return. $D_{c,t}^{1,5}$ is set to 1 if, in month t, the export destination risk of country c increases among the highest, i.e. country c is in the quintile 5 according to the sort based on the export destination risk proxy with past three months CDS return. Similarly, $D_{c,t}^{1,5}$ is set to -1, if the country c is in the quintile 1, and is set to 0, if country c is in other quintiles. $Rating\_chg_{c,t}$ is the total number of long-term foreign currency credit rating/outlook changes (including Moody's, S&P and Fitch) among country c's export destination countries during the past 3 months from t-2 to t. $D_{c,t}^{good}$ is -1, if country c is in quintile 1 based on export destination risk proxy (i.e., its export destination risk increase the least) during months t-2 to t, and is 0 otherwise. $D_{c,t}^{bad}$ is 1, if country c is in the quintile 5 based on sovereign CDS returns during months t-2 to t, and is 0 otherwise. Other control variables include country c's past three months cumulative CDS return, the CPI inflation, GDP growth rate and the export to GDP ratio. The country and month fixed effect are also controlled. The robust t-statistics are reported within parentheses and *, **, and *** are indicators of statistical significance at the 10%, 5%, and 1% levels, respectively.

	Sovereign CDS return $Ret_{c,t+1}$ (%)			
	(1)	(2)	(3)	(4)
$D_{c,t}^{1,5}$	0.35***	0.35**		
	[2.75]	[2.82]		
$D_{c,t}^{1,5} * Rating\_chg_{c,t}$	-0.007**	-0.007*		
	[-2.20]	[-2.09]		
$D_{c,t}^{good}$			0.30*	0.30
			[1.80]	[1.42]
$D_{c,t}^{bad}$			0.40**	0.40***
			[2.15]	[3.01]
$D_{c,t}^{good} * Rating\_chg_{c,t}$			-0.004	-0.004
			[1.04]	[0.90]
$D_{c,t}^{bad} * Rating\_chg_{c,t}$			-0.009**	-0.009**
			[-1.96]	[-2.09]
$Rating\_chg_{c,t}$	-0.05	-0.05**	-0.0004	-0.0004**
	[-0.24]	[-2.78]	[-0.20]	[-2.24]
Controls	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes
Monthly FE	Yes	Yes	Yes	Yes
Cluster by Country	Yes	No	Yes	No
Cluster by Time	No	Yes	No	Yes
No. Obs.	11,219	11,219	11,219	11,219
Adj. R^2	0.16	0.16	0.16	0.16

Table VI: Fama-MacBeth regressions of return predictability: Partition on direct and indirect impact

This table reports results from panel regressions of weekly sovereign CDS return. The independent variables include the direct export destination risk $ExRisk$, which is the weighted average sovereign CDS returns in the past 12 weeks using the bilateral export as the weight, and the indirect export destination risk $ExRisk\_Indirect$, which is the weighted average of the export destination risk using the bilateral export as the weight. Other control variables include exporting countries' own past 12-week cumulative sovereign CDS returns, lagged monthly inflation (month over month), which is calculated using the seasonally adjusted CPI index; lagged one year annual GDP growth rate; and the lagged one year export-to-GDP ratio. The 12-lag Newey-West t-statistics is provided in parenthesis, and *, **, and *** are indicators of statistical significance at the 10%, 5%, and 1% levels, respectively.

Panel B: Forecasting Weekly CDS Spread Changes								
(in percent)	*t*+1	*t*+2	*t*+3	*t*+4	*t*+5	*t*+6	*t*+7	*t*+8
$ExRisk$	0.1099***	0.0959**	0.0601	0.0718*	0.0254	0.0126	0.0083	0.0137
	[2.66]	[2.00]	[1.48]	[1.92]	[0.60]	[0.36]	[0.24]	[0.38]
$ExRisk\_Indirect$	0.0317	0.0759	0.0982**	0.1406***	0.0658	0.0890*	0.0459	0.0087
	[0.70]	[1.55]	[2.00]	[2.65]	[1.30]	[1.77]	[0.89]	[0.17]
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No. Obs.	746	746	746	746	746	746	746	746
Adj. R^2	0.21	0.21	0.20	0.20	0.21	0.21	0.21	0.21

Table VII: Other measures of attention and Fama-MacBeth regression

This table reports the results for Fama-MacBeth regressions of monthly CDS returns. Independent variables include the export destination risk proxy $ExRisk_{c,t}$, and two interaction variables , $ExRisk_{c,t}$ is the weighted average CDS returns of country c's export destination countries during the past 3 months, using the prior calendar year's export volume from country c as the weight. The interacted variables are dummies equal to one when the following variables are greater than their medians: (1) $Liquidity_{c,t}$: the number of brokers for country c's sovereign CDS in month t-1; (2) $Centrality_{c,t}$: a measure of country c's importance in the global trade network using eigenvalue decomposition, Richmond (2016). Other controls (basic set of controls) that are included in some specifications but are not reported include: lagged seasonally adjusted month over month *Inflation*, the lagged annual GDP growth rate and *the lagged* annual export to GDP ratio. The standard errors are computed with a Newey-West correction with 12 lags. Fama-MacBeth t-statistics are reported within parentheses, and *, **, and *** are indicators of statistical significance at the 10%, 5%, and 1% levels, respectively.

	Sovereign CDS return $Ret_{c,t+1}$ (%)			
	(1)	(2)	(3)	(4)
$ExRisk_{c,t}$	0.14***	0.10***	0.12***	0.09***
	[5.05]	[4.00]	[3.89]	[2.59]
$ExRisk_{c,t} * Liquidity_{c,t}$	-0.09***	-0.10***		
	[-3.09]	[-3.43]		
$Liquidity_{c,t}$	0.25**	0.33***		
	[2.49]	[3.48]		
$ExRisk_{c,t} * Centrality_{c,t}$			-0.10**	-0.06*
			[-2.07]	[-1.84]
$Centrality_{c,t}$			0.34**	0.27**
			[2.20]	[2.24]
Controls	No	Yes	No	Yes
No. Obs.	173	173	173	173
Adj. R^2	0.08	0.36	0.09	0.37

Table VIII: Forecasting Stock Market Returns

This table reports the return predictability of the export destination risk on stock market returns. The results are obtained by repeating the similar exercise in Table II and III but replacing the sovereign CDS returns with stock index returns (in dollar). Panel A presents the cross market long/short stock index portfolio return. At the end of each month, countries are sorted into five quintile portfolios (P1 to P5) based on their export destination risk proxy. The export destination risk proxy is calculated as the weighted average of the export destination countries' CDS returns during the past 3 months, using the export in the prior calendar year as the weight. All countries' stock index returns are equally weighted within a given quintile portfolio and the portfolios are held for 1 month. The long/short strategy is constructed by going long on the stock indices of countries in quintile P1 and selling short stock indices of countries in quintile P5. Panel A contains equally-weighted returns of each portfolio as well as the long/short portfolio. The row (1) reports the raw return. The row (2)-(5) control for various combinations of risk factors and report the abnormal portfolio return. In the row (2), the stock index momentum return with 3 month forming period and 1 month holding period is controlled. In the row (3), the equal-weighted market average stock index returns is controlled. In the row (4), both the index average return and the momentum return are controlled. In the row (5), the global momentum and value factors (Asness, Moskowitz and Pedersen, 2013) are further added. The corresponding alphas are reported in the table. The 12-lag Newey-West t-statistics are provided in parenthesis, and *, **, and *** are indicators of statistical significance at the 10%, 5%, and 1% levels, respectively.

	Panel A: Portfolio Approach (%)					
	P1	P2	P3	P4	P5	P1 – P5
(1)	1.58***	1.31**	0.97*	0.91*	0.59	0.99***
	(2.75)	(2.27)	(1.81)	(1.76)	(1.03)	(3.26)
Sharpe Ratio						0.95
(2)	1.82***	1.38**	1.06**	1.01**	0.71	1.11***
	(3.55)	(2.59)	(2.13)	(2.02)	(1.26)	(3.39)
(3)	0.48**	0.25**	-0.06	-0.14	-0.49***	0.98**
	(2.28)	(2.55)	(-0.59)	(-1.12)	(-3.30)	(2.94)
(4)	0.63***	0.16**	-0.10	-0.17	-0.49***	1.13***
	(2.77)	(2.02)	(-0.95)	(-1.30)	(-2.74)	(2.93)
(5)	0.63***	0.19**	-0.13	-0.27*	-0.41***	1.05***
	(3.30)	(2.00)	(-1.23)	(-1.77)	(-3.10)	(3.74)

Panel B: Regression Approach SCDS-Stock				
	(1)	(2)	(3)	(4)
$ExRisk_{c,t}$	-0.0025***	-0.0026***	-0.0024**	-0.0017*
	[-3.81]	[-3.00]	[-2.22]	[-1.88]
$ExRisk_{c,t}^{Stock}$		0.0011	0.0010	0.0008
		[1.46]	[1.23]	[0.88]
$RetOwn$			0.0307***	0.0322***
			[3.72]	[4.72]
$Inflation$				0.1749
				[1.01]
$GDPGrowth$				0.0015*
				[1.78]
$Export\ to\ GDP$				0.0018
				[0.58]
No. Obs.	173	173	173	173
Adj. R^2	0.03	0.07	0.13	0.22

Appendix:

The list of SCDS countries and the first monthly return date

Country	SCDS starting date	stock index	Stock index starting date
Algeria	Sep-2008		
Angola	Oct-2009		
Argentina	Apr-2001	MERVAL	Apr-2001
Austria	Jul-2001	ATX	Jul-2001
Australia	Oct-2003	AS51	Oct-2003
Barbados	Jul-2006		
Belgium	Mar-2001	BEL20	Mar-2001
Bulgaria	May-2001	SOFIX	May-2001
Bahrain	Aug-2004	BHSEASI	Aug-2004
Belize	Jan-2010		
Brazil	Feb-2001	IBOV	Feb-2001
Tunisia	Dec-2003	TUSISE	Dec-2003
Canada	Oct-2003	SPTSX	Oct-2003
Chile	Mar-2002	IGPA	Mar-2002
China	Feb-2001	SHSZ300	Feb-2001
Hong_Kong	Sep-2004	HSCI	Sep-2004
Colombia	Apr-2001	COLCAP	Apr-2001
Costa_Rica	Sep-2003	CRSMBCT	Sep-2003
Croatia	Feb-2001	CRO	Feb-2001
Cyprus	Aug-2002	CYSMMAPA	Aug-2002
Czech	Apr-2001	PX	Apr-2001
Germany	Nov-2002	DAX	Nov-2002
Denmark	Dec-2002	KFX	Dec-2002
Dominica	Aug-2003		
Ecuador	Jul-2003		
Egypt	Apr-2002	HERMES	Apr-2002
El_Salvador	Jul-2003		
Estonia	Jul-2004	TALSE	Jul-2004
Fiji	Jul-2007		
Finland	Aug-2002	HEX	Aug-2002
France	May-2002	CAC	May-2002
Greece	Feb-2001	ASE	Feb-2001
Guatemala	Sep-2003		
Iceland	Apr-2004		
India	Aug-2003		Aug-2003

Indonesia	Jan-2002	JCI	Jan-2002
Iraq	Mar-2006		
Ireland	Feb-2003	ISEQ	Feb-2003
Israel	May-2001	TA-25	May-2001
Italy	Mar-2001	FTSEMIB	Mar-2001
Jamaica	Oct-2003	JMSMX	Oct-2003
Japan	Feb-2001	TPX	Feb-2001
Jordan	Oct-2003	JOSMGNFF	Oct-2003
Kazakhstan	Feb-2004	KZKAK	Feb-2004
South_Korea	May-2001	KRX100	May-2001
Latvia	Sep-2004	RIGSE	Sep-2004
Lebanon	Apr-2003	BLOM	Apr-2003
Lithuania	May-2002	VILSE	May-2002
Malaysia	May-2001		May-2001
Malta	Aug-2004	MALTEX	Aug-2004
Macedonia	Oct-2011		Oct-2011
Mexico	Feb-2001	MEXBOL	Feb-2001
Morocco	May-2001	MCSINDEX	May-2001
Netherlands	Sep-2003	AEX	Sep-2003
Nigeria	Jan-2007	NGSEINDX	Jan-2007
Norway	Nov-2003	OBX	Nov-2003
New_Zealand	Jan-2004	NZSE50FG	Jan-2004
Oman	Dec-2008	MSM30	Dec-2008
Pakistan	Aug-2004	KSE100	Aug-2004
Panama	Mar-2002	BVPSBVPS	Mar-2002
Peru	Mar-2002	SPBLPGPT	Mar-2002
Philippines	Apr-2001		Apr-2001
Poland	Feb-2001	WIG	Feb-2001
Portugal	Mar-2002	BVLX	Mar-2002
Qatar	Oct-2001	DSM	Oct-2001
Hungary	Apr-2001	BUX	Apr-2001
Georgia	Jul-2015		
Romania	Apr-2002	BET	Apr-2002
Ghana	Jun-2008	GGSECI	Jun-2008
Russia	Oct-2001	INDEXCF	Oct-2001
Saudi_Arabia	Mar-2007	SASEIDX	Mar-2007
Singapore	Aug-2003		Aug-2003
Slovakia	Jun-2001	SKSM	Jun-2001
Slovenia	Mar-2002	TOP40	
South_Africa	Feb-2001		Feb-2001
Spain	Mar-2001	IBEX	Mar-2001

Serbia	Jul-2006		Jul-2006
Sri_Lanka	Jan-2008	CSEALL	Jan-2008
Sweden	Jul-2001	OMX	Jul-2001
Switzerland	Jul-2007	SMI	Jul-2007
Taiwan	Sep-2006	TWSE	Sep-2006
Thailand	Apr-2001	SET	Apr-2001
Trinidad and Tobago	Dec-2004		
Turkey	Feb-2001	XU100	Feb-2001
UAE	Mar-2007	DFMGI	Mar-2007
United_Kingdom	Apr-2006	UKX	Apr-2006
Ukraine	Oct-2002	UX	Oct-2002
Uruguay	Jun-2002		
US	Jan-2004	SPX	Jan-2004
Venezuela	Mar-2001		
Vietnam	Sep-2002		Sep-2002