Price determinants of shadow banking products in China: An analysis of collective fund trust products*

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Current Draft: January 2017

*The authors thank seminar participants at Peking University and the 2016 China Economic Society Annual Meeting for their valuable comments and suggestions. This research is financially supported by the Bridge Trust Asset Management Research Fund.

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Abstract

Price determinants of shadow banking products in China: An analysis of collective fund trust products

This paper analyzes how collective fund trust products – China's key shadow banking products – are priced. To address potential sample selection problems, we conduct a two-stage estimation that jointly considers issue and pricing decisions of the trust products. We find that credit spread, term spread and risk-free rate have opposite signs in the two decision equations, which suggests that issue and pricing are driven by investors' demand for trust products. We also find that trust yield spreads tend to decline recently and it is attributed to changes in market reaction to fundamentals rather than changes in fundamentals. Time series analyses show that the shock in credit spread has the largest and the most immediate impacts on the trust yield spread. Our evidence generally supports risk- and information-based pricing.

Keywords: Chinese shadow banking, Collective fund trust product, Trust yield spread, Sample selection bias

JEL Classification: G12, G23

1 Introduction

Recently, numerous research in finance and economics has studied the impact of shadow banking on the Chinese economic and firm growth (Allen et al., 2013; Ayyagari et al., 2010; Allen et al., 2005) as well as the Chinese banking system (Chen et al., 2016; Hachem and Song, 2016).[1] However, little attention has been paid from an asset pricing perspective. In this paper, we use the data of a product in Chinese shadow banking and attempt to examine what determines its prices and whether the pricing is based on risk and information.

As an important player of shadow banking in China, the trust industry has experienced a rapid development since 2008, and it has become the second biggest financial sector following the bank industry in terms of the size of assets under management (AUM). Trust products in China differ from conventional mutual funds in that their returns are fixed and the products have a set maturity. They are also distinct from bank deposits in that the fund is invested in a range of assets and the offered returns significantly exceed regulated deposit rates. In the trust industry, the collective fund trust products have particularly attracted a large number of investors for their high returns, and indeed the AUM in the collective fund trust products and its proportion in the total trust industry have increased steadily.

However, many of these products tend to lack transparency in that their information disclosure is limited. Other than basic information such as fund size and fund management style, the prospectuses of these products feature only generic statements that notify potential investors that the products are not deposits and carry investment risks, and there is a limited amount of useful information about credit ratings and fund

[1] The Financial Stability Board (2012) proposes to define shadow banking as credit intermediation or lending activity that involves entities and transactions outside the regular banking system.

management style. A more serious problem is that many investors regard the trust products as implicitly guaranteed and risk free, despite the contrary legal status (Perry and Weltewitz, 2015). There has been little track record of unresolved defaults in the trust industry, and therefore banks through which trust products are generally issued are reluctant to be the first to default. A pattern of bailouts overseen by Chinese authorities and financial institutions has apparently given many investors the impression that the trust products are implicitly guaranteed. Lack of transparency and investors' misperception of "implicit guarantee" imply that the trust products could possibly be incorrectly priced, and it is important to examine whether the trust products are priced in well-grounded reasons. Our work is motivated by this issue and we analyze how the collective fund trust products are priced.

In consideration of the special characteristics in China's trust products, we use the promised yield data of 11,564 collective fund trust products issued between January 2007 and March 2016 and analyze the determinants of their yields. In the analysis, a sample selection bias may arise because a collective fund trust product and its yield are observed only when a trust company makes a positive decision to issue the product. Thus, the conventional estimation of the determinants without considering the potential truncation may not provide an unbiased result. To address this issue, we conduct a two-stage estimation that jointly considers both issue and pricing decisions of the trust products. To the best of our knowledge, no previous study has employed the similar solution for the potential sample selection problem in pricing a Chinese shadow banking product.

Besides the correction of a sample selection bias, we examine whether after a series of regulations that requires risk controls, there has been any structural change in the relationship between the trust yields and their determinants. In particular, the Chinese

financial system has rapidly transited and Chinese authorities have changed the regulations in several times during our sample periods. Following Eichengreen and Mody (1998), we employ the Blinder-Oaxaca decomposition (Blinder, 1973; Oaxaca, 1973), which enables us to know whether changes in yields are attributed to changes in fundamentals or to changes in pricing pattern for given fundamentals. The decomposition is used to provide an evidence of the structural changes in how the collective fund trust products are priced.

Furthermore, we conduct the vector autoregression (VAR) model to analyze the dynamic relationship between the yield spread of collective fund trust products and its determinants. Specifically, we examine the impulse response functions of the average trust yield spread to shocks in its determinants over a one-year horizon. Also, to assess the contribution of each innovation on the variation in trust yield spreads, variance decomposition is employed in this paper.

Overall, using variables of macroeconomic activities and credit conditions as the regressors in both issue and pricing equations, we find that credit spread, term spread, and risk-free rate have the opposite signs in the two equations with statistical significance. Specifically, risk-free rate and term spread have negative (positive) coefficients in the issue (pricing) equation, while the signs of credit spread coefficients are the opposite. Since risk-free rate and term spread (credit spread) are generally low (high) in a bad economic situation and at that time investors seek alternative investment more actively, our findings imply that the yield spreads of Chinese collective fund trust products are mainly determined by investors' demand for trust products rather than supply of the products. In addition, trust companies' size, leverage ratio, and the trust product fund size are significant determinants of the trust yield spread and their signs are consistent with risk- and information-based pricing. We also find that the trust yield spreads

declined after a series of risk-controlling regulations were issued in 2011 and 2012 and that the decline is attributed to changes in market reaction to fundamentals (pricing pattern), rather than changes in fundamentals. Through time series analysis, we find that the shock in credit spread has the largest and the most immediate impacts on the yield spread.

Our work joins a growing literature dealing with the price determinants of Chinese shadow banking. Allen et al. (2015) conduct a comparable study using entrusted loans and find that the pricing of the entrusted loans are determined by borrowers' fundamental and information risks. This paper differs in that the structure and risk of entrusted loans are different from those of collective fund trust products. Furthermore, our work explicitly addresses the sample selection problem and examines a structural change in the pricing pattern of the shadow banking products. Hence, our study contributes new ideas to the increasingly important topic of the Chinese shadow banking.

The rest of the paper is organized as follows. Section 2 presents detailed information about trust in China. The empirical methodology is described in Section 3. Section 4 explains our dataset and presents descriptive statistics. In Section 5, we present our empirical findings and discuss their implications. Section 6 concludes.

2 Institutional background

For better understanding of the concepts and terminologies in later sections, this section overviews the brief development history of Chinese trust industry and its unique characteristics.

2.1 Development of the trust industry in China

At the beginning of economic reform in October 1979, China's first trust institution, China International Trust and Investment Corporation (CITIC), was approved by the State Council and established in response to strong demand for construction funds from different regions and sectors. In early 1990's, approximately 1,000 trust companies existed in China without the same level of regulations imposed on players in other financial sector. Back then, the main function of trust companies was lending to the construction sector. By the end of 2002, the industry had undergone five big consolidations, after which only 60 trust companies survived. In 2003, the China Banking Regulatory Commission (CBRC) took over supervisory and regulatory oversight of the trust sector from the People's Bank of China (PBOC) to better manage the rapidly growing trust industry and launched investigations into several trust companies, which uncovered some scandals such as the default by Jinxin Trust and Investment Company on one of its trust products.[2] Since then, the CBRC issued numerous guidelines, which required trust companies to disclose more information on their financial performance.

In 2007, the CBRC introduced two new crucial regulations, *Rules on Management of Trust Companies* and *Rules on Management of Collective Fund Trust Products in Trust Companies*. The objective of these new regulations is to convert the existing trust companies from simple lenders to professional financial institutions that can properly control risks and promote innovations, while in compliance with rules and regulations.[3] The latter new regulation formally defines the collective fund trust products, which will be described in Section 2.2. In the late 2000s, as the cooperation between banks and

[2]Section 2.2 describes how it had been resolved in detail.

[3]Specifically, the former regulation allows trust companies to engage in pension fund management, wealth management in overseas investment, private equity investment, asset securitization and financial leasing, apart from their primary lending business. By this regulation, the term of 'Trust and Investment companies' is replaced by simply 'Trust Companies' with emphasis on their trust role rather than the proprietary investment.

trust companies had deepened, some trust products were suspicious of taking banks' loans off the balance sheet to overcome lending quotas, and some media called trust companies the "shadow banks." To cope with growing concerns about potential risk in this shadow banking industry, until the end of 2011, the CBRC issued 36 new regulations and notices that emphasize the risk control in the non-banking financial sector, and they have impacts on the way trust companies should operate.

Since the new regulations in 2007, the trust industry has experienced a rapid development.[4] The total AUM of all trust companies was CNY 1.22 trillion (approximately USD 187.69 billion) in the end of 2008, but it reached CNY 16.30 trillion (approximately USD 2.51 trillion) at the end of 2015, which is roughly 25% of the GDP.[5] The AUM in the trust industry has increased more than 13 times in the last seven years with an average annual growth rate of 44.82%. The AUM in the trust industry exceeded that in mutual funds in 2010, and exceeded that in the insurance industry in 2012. The trust industry has now become the second biggest financial sector following the bank industry in terms of the AUM.

In China, a trust has more meanings that go beyond a conventional legal definition in that it includes characteristics of private equity, asset management and banking sectors. Many trust companies become a vital source of financing for many privately owned companies in China that have difficulty in getting a bank loan. Trust companies and their products have more flexibility than other financial institutions. Most noticeably, trust companies face fewer regulations. In China, trust companies are currently the only financial institution that is allowed to make an investment jointly in the capital market, money market and even real industrial areas.[6] Hence, various structures and

[4]China Trustee Association: http://www.xtxh.net/xtxh/english/index.jhtml

[5]The exchange rate of USD to CNY has fluctuated from 6.05 CNY/USD in early 2014 to 6.58 CNY/USD in early 2016. We use the exchange rate of 6.5 CNY/USD throughout the paper.

[6]As of March 2016, securities companies and insurance companies are allowed to invest neither in

methods could be used to drive revenue, such as assets purchased under a resale agreement, asset backed securities (ABS), improving the management efficiency of a property (e.g., the charging rights for a toll road), or holding stocks for a client and then selling them at an agreed-upon price to earn a higher return. The wide scope of investment makes trust companies advantageous in raising capital compared to other financial institutions. Other financial institutions even use trust companies as intermediaries to make investments they cannot make themselves due to regulatory restrictions.

2.2 Collective fund trust

A collective fund trust product was formally introduced by *Rules on Management of Collective Fund Trust Products in Trust Companies* in 2007. To better understand it, we make comparison with single fund trusts, Single fund trusts are defined as having one trustor (typically a bank) while the collective fund trusts have two or more trustors. Besides the number of trustors, there are other important differences. A single fund trust is the product in which a trustor sets out its requirements and a trust company creates a product based on those criteria. Banks charge high fees and competition among trust companies is fierce, which implies low profit margins of trust companies for this line of business. Nowadays most single fund trust products are recorded in the bank's balance sheet and the issuing bank explicitly guarantees the principal invested (and sometimes the interest as well). In contrast, for a collective fund trust, the trust companies rather than the issuing bank play a more active role in managing and promoting the trust

industrial areas nor in the equity of unlisted companies. Therefore, they can invest in the industrial area only indirectly by purchasing trust products. Recently, the China Insurance Regulatory Commission (CIRC) and the China Securities Regulatory Commission (CSRC) are making out drafts of new regulations, in which the scopes of investment widen. For example, under one draft proposed in 2014, security companies are allowed to invest in equities, debts and rights of assets in unlisted companies, so that the investment scope of securities companies is almost identical to that of trust companies. However, it is only a draft and has not been officially enacted, so the investment scope of trust companies is still the widest.

products, and they compete more on product quality rather than on price, which should ultimately drive their margins higher. Collective fund trust products are not recorded on banks' balance sheets, and the role of banks is limited to being passive distributors by using their sales force and branch networks to attract investors. Funds from multiple investors are pooled and then generally invested in a single asset or asset type, and hence do not have diversification benefits.

The AUM in the collective fund trust products and its proportion in the total trust industry have increased steadily as shown in Table 1. In the end of 2015, the AUM in the collective fund trust products reached CNY 5.34 trillion and accounted for 32.78% of the AUM in the total trust products.

One important fact about collective fund trust products is that there is no explicit guarantee by issuing banks or trust companies and investors legally bear the investment risks. [7] However, a pattern of trust products' bail-outs overseen by Chinese authorities and financial institutions has apparently led many investors to regard all trust products as implicitly guaranteed and almost risk free (Perry and Weltewitz, 2015). On October 6, 2004, when Jinxin Trust and Investment Company failed to meet its earlier promise to repay more than CNY 80 million (USD 12.31 million) to investors, the China Securities Regulatory Commission (CSRC) set up the guidelines; the central bank repaid Jinxin's individual investors for all debts less than CNY 100,000 and pay 90% of the principal on debts over CNY 100,000. The CSRC said the guidelines are applicable for debts incurred only before September 30, 2004, but analysts believed that the guidelines, not formally released but understood as internal practice, would apply for all brokerages

[7] Because of high investment risks, the collective fund trust products are sold to the high-net-worth-individuals (HNWIs) and institutional investors. In a collective fund trust product, the maximum number of individual investors is 50, whereas there is no such restriction on the number of institutional investors. The required minimum size for a collective fund trust product is CNY 1 million (approximately USD 153,850).

entering high-risk procedures.[8] In addition to the bail-out decision, the CSRS sent a strong signal that the industry practice, which often promises zero risk and high returns, must be stopped. Since there did not exist many trust companies and it was difficult to get a trust company license, to keep the company license and the trust business, all trust companies had to pay attention to the repayment issue. That is, the CSRS's warning virtually required trust companies to "ensure" repayment of the promised principal and interest of trust products, and the market has perceived it as the implicit guarantee.

In 2010, due to the mature of large size of real estate trust products and coupled with the regulation of the real estate market, the market began to worry about the successful repayment of the trust products with full principal and expected yield as promised in the trust contract. In response, the regulators repeatedly asked trust companies to "pay attention" to repayment of trust products. Consequently, when the trust projects did not generate sufficient profit, trust companies "had to" pay back by using its own asset or by introducing a third part to bear the loss. In early 2014, the default risk of a trust company arose again. China Credit Trust warned investors that they may not be repaid for the CNY 3 billion-products on the maturity date. Media as well as investors took a close look at the case to see if it could shatter the implicit guarantee assumption in the trust industry.[9] It turned out that a mysterious "third-party" took over the liability and China Credit Trust managed to avoid a default. Neither China Credit Trust nor the issuing bank, Industrial and Commercial Bank of China, acknowledged where the funds came from to repay investors.[10]

This practice has directly sent a signal to investors that there is no repayment risk of

[8] Caijing Magazine: http://english.caijing.com.cn/2004-10-10/100013858.html

[9] http://www.reuters.com/article/china-icbc-idUSL3N0KR01T20140117, http://www.bloomberg.com/news/articles/2014-01-17/icbc-won-t-bail-out-troubled-china-trust-product-official-says.

[10] http://www.forbes.com/sites/oliverbarron/2014/01/27/china-trust-default-avoided-what-comes-next/#6d6d74447dea

collective fund trust products and they are effectively protected by the regulators. Also, considering the risk of losing reputation and the requirement from regulators, the trust companies are indeed willing to get investors paid their principal and the expected yield of the trust products. Since then, the guaranteed repayment culture in trust industry of China has been further reinforced despite its actual risk.

3 Empirical methods

3.1 Sample selection model

This section describes a model to explain how the yield spread of the collective fund trust products, denoted by y, is determined. The yield spread is the difference between the trust yield offered by the trust company at the issuance and the government bond yield with the same maturity. We subtract the government bond yield to remove any effects related to maturity. Since there is no reliable secondary market for this product, we only consider the spread at the issuance. The trust yield spread determinants, denoted by x, include trust company's characteristics (firm size, profitability, and leverage ratio), trust product's characteristics (maturity, fund size, fund management style, and issue city), credit conditions (risk free rate, term spread, credit spread), and macroeconomic activities (inflation rates and real industrial production growth) at the time of issue. We begin with a standard linear model of the spread as follows,

$$y_i = x_i'\boldsymbol{\beta} + u_i, \quad i = 1, ..., N, \tag{1}$$

where N is the number of trust products in the sample.

Note that the trust yield spread and its determinants are observed only when a

trust company makes a positive decision to issue a product. Therefore, the conventional estimation of Equation (1) without considering this potential truncation may not provide an unbiased result. In other words, a sample selection problem may arise in the observed sample. To address the potential selection bias, we assume that the trust companies time the market when making an issue decision. Specifically, let the equation that determines the sample selection be

$$z_t^* = w_t'\boldsymbol{\gamma} + v_t, \quad t = 1, ..., T, \tag{2}$$

where z^* is the latent variable on which trust companies' issue decision is based. We assume that trust companies decide to issue trust products if z^* is above a threshold. Without loss of generality, we set up the threshold to be zero. w is a vector of variables that determine the willingness to issue of trust companies. In this paper, w includes equity market factors (Fama French three factors), credit conditions (risk free rate, term spread, and credit spread), and macroeconomic activities (inflation rate, and real growth of industrial production). T is the length of the time series in the sample. We assume that the errors in the two equations $(u, v)'$ are a bivariate normal random vector with mean zeros, variances of σ^2 and 1, and correlation coefficient of ρ. Then, this setup turns to a standard sample selection model introduced by Heckman (1979).[11] We can consistently estimate this model by using a two-stage method (Greene, 2012) as described below.

In the first stage, we conduct the probit estimation of Equation (2) (issue equation, hereafter) by maximum likelihood to obtain estimates of $\boldsymbol{\gamma}$. We explain how the dummy dependent variable z is defined in Section 4. Then, we compute the inverse Mills ratio ($\hat{\lambda}_t = \frac{\phi(w_t'\hat{\boldsymbol{\gamma}})}{\Phi(w_t'\hat{\boldsymbol{\gamma}})}$) for each observation, where $\phi(\cdot)$ and $\Phi(\cdot)$ are the probability density

[11] Several papers analyze the pricing of debt issue by employing a range of sample selection models (Puri, 1996; Eichengreen and Mody, 1998; Fang, 2005; Goyal, 2005).

function and the cumulative distribution function of the standard normal distribution, respectively. In the second stage, we match the computed $\hat{\lambda}_t$ to all trust products issued at time t, and rename them $\hat{\lambda}_i$. By construction, $\hat{\lambda}_i$ and $\hat{\lambda}_j$ take the same value if the trust products i and j are issued at the same time t. Then, we modify Equation (1) to adjust the potential sample selection bias by including the inverse Mills ratio as an additional independent variable:

$$y_i = x_i'\boldsymbol{\beta} + \beta_\lambda \hat{\lambda}_i + \tilde{u}_i \equiv \tilde{x}_i'\tilde{\boldsymbol{\beta}} + \tilde{u}_i, \quad i = 1, ..., N. \tag{3}$$

By estimating Equation (3) (pricing equation, hereafter) by least squares, we can obtain the unbiased estimates of $\boldsymbol{\beta}$. In addition, it turns out that $\beta_\lambda = \rho\sigma$ (Greene, 2012). Therefore, by checking the sign and significance of $\hat{\beta}_\lambda$, we can learn whether the errors in issue and pricing equations are positively or negatively correlated.

3.2 Blinder-Oaxaca decomposition

It is interesting and meaningful to examine whether there is any structural change in the pricing mechanism over time. In this section, we describe a methodology that attempts to identify the presence of a structural change between two subperiods and the source of the change, if any. Specifically, we examine whether changes in trust yield spreads are attributed to changes in fundamentals or whether there have been changes in pricing pattern for given fundamentals by using the Blinder-Oaxaca decomposition (Blinder, 1973; Oaxaca, 1973).[12]

[12]This technique is originally designed to study labor market outcomes by groups such as sex and race, but it has been applied to other fields. For example, O'Donnell et al. (2008) use this method to analyze health inequalities by poverty status, and Eichengreen and Mody (1998) identify the source of changes in emerging countries' debt markets. Grinblatt et al. (2011) analyze how much of the difference between high- and low-IQ individuals' stock market participation rates can be explained by differences in control variables.

Let (y_A, x'_A) be a vector of the trust yield spreads and their determinants for collective fund trust products issued in the subperiod A. Similarly, (y_B, x'_B) represents the products issued in subperiod B. Then, the average change in the trust yield spreads over the two subperiods is

$$D \equiv E[y_{Ai}] - E[y_{Bi}],$$

where $E[\cdot]$ denotes the expected value. Recall that $y_{li} = \tilde{x}'_{li}\tilde{\boldsymbol{\beta}}_l + \tilde{u}_{li}$ for $l \in \{A, B\}$. Since $E[\tilde{u}_{li}] = 0$ in any subperiod, the average change in the yield spreads is

$$\begin{aligned} D &= E[\tilde{x}_{Ai}]'\tilde{\boldsymbol{\beta}}_A - E[\tilde{x}_{Bi}]'\tilde{\boldsymbol{\beta}}_B \\ &= (E[\tilde{x}_{Ai}] - E[\tilde{x}_{Bi}])'\,\tilde{\boldsymbol{\beta}}_B + E[\tilde{x}_{Bi}]'(\tilde{\boldsymbol{\beta}}_A - \tilde{\boldsymbol{\beta}}_B) + (E[\tilde{x}_{Ai}] - E[\tilde{x}_{Bi}])'\,(\tilde{\boldsymbol{\beta}}_A - \tilde{\boldsymbol{\beta}}_B). \end{aligned}$$

The first component in D accounts for the changes in trust yield spreads due to the changes in the determinants. Thus, this can be thought of as the contribution of the changes in fundamentals. The second component measures the contribution of the changes in the coefficients. Since the coefficients describe how the market views the creditworthiness of a trust product holding all fundamentals being fixed, Eichengreen and Mody (1998) interpret this second component as the contribution of changes in market sentiment. We interpret this term similarly but more moderately as the contribution of changes in market reaction to fundamental. The third component is an interaction term that explains the effect of simultaneous changes in the determinants and the coefficients. These three components are calculated from the estimates for $\tilde{\boldsymbol{\beta}}_A$ and $\tilde{\boldsymbol{\beta}}_B$ and the sample averages in the determinants obtained separately from the two subperiods.

3.3 Time series analysis

We conduct the vector autoregression (VAR) analysis to have deeper insight into the dynamic relationship among the yield spread of collective-fund trust products and credit condition variables. Since each variable may have not only contemporaneous but also lagged effects on others, this VAR analysis can be complementary to the static two-stage analysis described in Section 3.1. Specifically, we examine the response of trust yield spreads to innovations in other variables and the extent to which forecast error variances of trust yield spreads are explained by innovations in other variables over a one-year horizon.

Let Y_t be a $K \times 1$ vector containing the average trust yield spread and its determinants measured in month t. To avoid a potential misspecification problem argued in Section 3.1, we also include the inverse Mills ratio (λ_t) obtained from the issue equation estimation. We assume that the dynamics of Y_t are governed by a p^{th}-order vector autoregression,

$$Y_t = c + \Phi(1)Y_{t-1} + \cdots + \Phi(p)Y_{t-p} + \epsilon_t, \tag{4}$$

where $\Phi(s)$ is a $K \times K$ coefficient matrix and $\epsilon_t \sim i.i.d.N(0, \Omega)$. The parameters in Equation (4) are estimated by maximum likelihood and the lag length is optimally chosen by the likelihood ratio test. In the current analysis, the trust yield spread in Y_t is ordered as the last variable, which is based on a reasonable assumption that the trust yield spread is contemporaneously influenced by its determinants but does not have immediate impacts on them.

Equation (4) has a $MA(\infty)$ representation as follows:

$$\begin{aligned} Y_t &= \mu + \epsilon_t + \Psi(1)\epsilon_{t-1} + \Psi(2)\epsilon_{t-2} + \cdots, \\ &= \mu + \sum_{s=0}^{\infty} \Psi(s)\epsilon_{t-s}, \end{aligned}$$

where $\Psi(s)$ is a $K \times K$ coefficient matrix and $\Psi(0)$ is an identity matrix I_K.

The matrix $\Psi(s)$ is interpreted as $\frac{\partial Y_{t+s}}{\partial \epsilon_t'}$, the impulse response function. Specifically, the entry in row i and column j in $\Psi(s)$, denoted by $\Psi(s)_{ij}$, indicates the consequence of the i^{th} state variable in month $t+s$ with respect to a unit innovation in j^{th} state variable in month t. Note that innovations in the state vector can be contemporaneously correlated. To assess the effects of an orthogonal innovation, $\Psi(s)$ is post-multiplied by the lower triangular matrix H, where $HH' = \Omega$. Formally,

$$\begin{aligned} Y_t &= \mu + \sum_{s=0}^{\infty} \Psi(s)\epsilon_{t-s}, \\ &= \mu + \sum_{s=0}^{\infty} \Psi(s)HH^{-1}\epsilon_{t-s}, \\ &\equiv \mu + \sum_{s=0}^{\infty} \Gamma(s)e_{t-s}, \end{aligned}$$

where $e_t = H^{-1}\epsilon_t \sim N(0, I_K)$ and $\Gamma(s) = \Psi(s)H$. $\Gamma(s)$ represents the *orthogonalized* impulse response function.

Given that $Y_t = \sum_{s=0}^{\infty} \Gamma(s)e_{t-s}$, the h-step ahead forecast error of Y_t is obtained by $FE_{th} \equiv Y_{t+h} - Y_{t+h|t} = \sum_{s=0}^{h-1} \Gamma(s)e_{t+h-s}$. FE_{th} amounts to a $K \times 1$ vector in which i^{th} entry represents the forecast error of Y_{it}, denoted by FE_{ith}. From FE_{ith}, we can

compute the h-step ahead forecast error variance for Y_{it}. Formally,

$$Var(FE_{ith}) = \sum_{s=0}^{h-1} \Gamma(s)_{i1}^2 + \sum_{s=0}^{h-1} \Gamma(s)_{i2}^2 + \cdots + \sum_{s=0}^{h-1} \Gamma(s)_{iK}^2 = \sum_{k=1}^{K} \sum_{s=0}^{h-1} \Gamma(s)_{ik}^2.$$

Finally, the proportion of the h-step ahead forecast error variance in Y_i due to innovations in Y_j is obtained by $\sum_{s=0}^{h-1} \Gamma(s)_{ij}^2 / \sum_{k=1}^{K} \sum_{s=0}^{h-1} \Gamma(s)_{ik}^2$.[13]

4 Data

Our data cover all non-securities investment collective fund trust products issued from January 2007 to March 2016 (111 months).[14] After deleting observations with missing key variables, the final data contain 11,564 observations. Each observation includes a trust product's characteristics (trust yield spread, maturity, fund size, fund management style, and issue city), trust company's characteristics (firm size, profitability, and leverage ratio), and macroeconomic conditions (riskfree rate, credit spread, term spread, real industrial production growth, inflation, and equity pricing factors) at the time of issue.

The trust yield spread is measured by the difference between the expected yield of a trust product and the Treasury bond yield with the same maturity. Maturity is the length of months to the repayment, and the fund size is the amount of capital raised for the collective fund trust product (measured in million CNY). We classify the fund management style into eight categories: loan (*Loan*), rights of assets investment (*AssetRights*), private equity investment (*PE*), debt investment (*Debt*), repurchase

[13] For more details about the VAR model, impulse response functions and variance decomposition, see Hamilton (1994).

[14] The securities investment trust products cover stocks, bonds, warrants and stock index futures, and profit from secondary market trading. We exclude the securities investment products because they usually do not disclose the fixed expected yield and/or maturity.

agreement (*Repo*), finance lease trust (*Lease*), and others. If a fund is invested by a combination of these methods, it is classified as portfolio investment (*Portfolio*). To control the specific effect of each management style, we construct the seven dummies. The collective fund trust products in our sample were issued in 51 different cities in China. We classify the cities into two categories based on their per capita gross regional domestic product (GRDP). Assuming that a city is *developed* if its per capita GRDP is greater than the average, we define $D_{city} = 1$ if it is issued in a developed city, and $D_{city} = 0$ otherwise.

Firm size is the total assets of the trust company measured in million CNY. Profitability is proxied by the return on assets (*ROA*), the ratio of after-tax income to total assets. Leverage ratio is the ratio of total assets to equities. The data source of the trust product's and company's characteristics is WIND database. The descriptive statistics for a trust product's and company's characteristics are tabulated in Table 2.

Table 2 also reports the statistics of two representative product types, loan and PE. Although loan (PE)-type trust products tend to have a relatively smaller (larger) product size, other characteristics are not substantially distinguished. That is, the loan- and PE-type products are issued by trust companies with similar market capitalization, profitability and leverage ratio. Despite the similar characteristics of the issuing trust firms, the yield spreads of PE-type products are substantially higher. We will analyze the issue and pricing decisions not only for the entire sample but also for some subsamples partitioned based on product types to examine any differential issue and pricing mechanism among different types of products in Section 5.2.

Trust products issued at month t are matched to macroeconomic conditions of the corresponding month. The macroeconomic conditions are measured by the following variables. Riskfree rate (Rf) is the 3-month Shanghai Inter-bank Operation Rate. Credt

spread is the difference between the 10-year AAA enterprise bond yield and the 10-year treasury bond yield. Term spread is the difference between the 10-year treasury bond yield and the 1-year treasury bond yield. Inflation rates (*CPIg, PPIg*) are measured by the growth rates of consumer price index and producer price index. Real industrial production growth (*IPg*) is the year-on-year real industrial production growth rate. Equity pricing factors are the excess return of the market portfolio over the riskfree rate (*MKT*), the excess return of small-stock portfolios over big-stock portfolios (*SMB*), and the excess return of value-stock portfolios over growth-stock portfolios (*HML*). All macroeconomic condition variables are obtained from WIND database except for real industrial production growth (OECD)[15] and equity pricing factors (RESSET).

For the probit estimation of the issue equation, we need information on those who did not issue the trust products. To address this problem, we follow the approach used by Eichengreen and Mody (1998). In principle, for each month if there is no or too few issue, we record a zero ($z_t = 0$). As shown in Table 2, *Repo*- and *Lease*-type of trust products are relatively rare. Therefore, whether there is too few issue is judged by the absence of an issuance of these types of product. Specifically, we record $z_t = 1$ if at least one *Repo* or *Lease* trust product is issued in month t, and $z_t = 0$ if neither of them is issued in month t. The descriptive statistics for macroeconomic conditions are tabulated in Table 3.

For the time series analysis, we calculate the monthly time series of trust yield spreads by the cross sectional average yield spreads of trust products issued in each month. To ensure reliability of average values, we only consider the months in which at least 10 trust products are issued. In our sample, only six collective-fund trust products were issued in February 2009 but from March 2009 on, there have been more than 10 issues

[15]Due to the long spring festival holidays, most January or February observations are missing. We interpolate the missing observations.

each month. Hence, we use the period from March 2009 to March 2016 for the time series analysis.

5 Results and discussion

5.1 Sample selection model

This section presents the results of the two-stage estimation method, which addresses the potential sample selection bias in the observed sample, and also discusses their meanings. Tables 4 and 5 report the estimation results of the issue and pricing equations, respectively. For interpretation, we first focus on the explanatory variables that appear in both equations. By checking whether the coefficients of these variables show the same or opposite signs in the two equations, we can obtain an intuitive interpretation in terms of whether issuance and pricing are driven by demand for or supply of trust products (Eichengreen and Mody, 1998). Specifically, the same signs in both equations can be interpreted in supply-driven issues and pricing, while the opposite signs can be found in demand-driven transactions as will be explained below.

Tables 4 and 5 indicate that among the common explanatory variables, credit conditions (risk-free rate, credit spread and term spread) have significant coefficients, and they all have opposite signs in the two equations. Specifically, risk-free rate and term spread have negative (positive) coefficients in the issue (pricing) equation, while credit spread has coefficients with opposite signs. We interpret these findings as follows. Risk-free rate and term spread are generally low in a bad economic situation (Campbell and Shiller, 1991; Diebold et al., 2006), and at that time investors are likely to seek alternative investment venues more actively [FIND REFERENCES]. Given relatively high yields of trust products, the higher investor demand for alternative investment implies

that the probability of observing an issue is larger. In addition, the higher investor demand allows the trust products to be issued at a higher price (lower yield spread). Combined, the negative coefficient in the issue equation and the positive coefficient in the pricing equation are consistent with issuance and pricing driven by investors' demand for the trust products. Similarly, when the credit spread widens, investors usually move their capital away from riskier investments to safer venue (Bernanke et al., 1996; Holmstrom and Tirole, 1997). Given the feature of "implicit guarantee", investor demand for the "safer" investment vehicles such as trust products is likely to be high so that the probability of an issue is high and they are highly valued. In addition, note that in the pricing equation, the coefficient of the inverse Mills ratio (β_λ) is significantly negative. Since $\beta_\lambda = \rho\sigma$, this negative coefficient implies that the two error terms in the issue and pricing equations are negatively correlated ($\rho < 0$). This implies that unobserved factors that induce more issuance also lower the spread. Hence, the unobserved factors should also be interpreted as the unobserved demand. Intuitively, factors that induce more sales and higher price (lower yield) of a product and vice versa can be naturally interpreted as demand. To sum up, it turns out that in China, the issue and pricing of the collective fund trust products are mainly driven by the investors' demand for the products.

Besides the three common variables, Table 5 reports estimates from the variables of the trust company's and product's characteristics. Among trust company's characteristics, firm size is negatively associated with the trust yield spread, while higher leverage ratio is associated with a greater trust yield spread. Since smaller companies and companies with larger leverage ratio are likely to be riskier, investors require a higher expected yield. Allen et al. (2015) also find consistent results for another shadow banking product, entrusted loans.

More profitable trust companies tend to issue products with higher expected yield spreads, and the trust products with larger fund size are issued at a higher yield spread. Given fierce competition, trust companies have incentive to issue higher-yield products to attract investors. Hence, they offer high yields if they can afford them and/or they can benefit from economies of scale. Among the trust product's characteristics, maturity and the issue city are not significant. The insignificant effect of maturity is not surprising in that we already remove the maturity effect by subtracting the Treasury bond yield with the same maturity from the trust yield. In contrast, the fund management style has large and significant effects. Trust products whose funds are used in debt investment, loan, private equity investment and rights of asset investment are issued at statistically larger discounts, while those for financial lease and portfolio investment have statistically larger valuation (smaller trust yield spread). Finally, during bad economic times (lower growth of industrial production and inflation), investors require higher expected yields, which is consistent with time-varying risk aversion (Campbell and Cochrane, 1999). These findings are generally consistent with risk- and information-based pricing.

One may argue that our findings can also be explained by government regulation-driven, rather than investor demand-driven, pricing for the following logic; if the Chinese regulatory authorities are concerned about excessive herding of capital towards the trust industry in bad economic times, they will try to discourage investors' high demand for the purpose of risk management and will induce (or force) trust companies to offer lower trust yield spreads; with slowing down economic growth, this kind of government intervention may become stronger over time. Under this alternative explanation, we may observe the qualitatively identical results for issue and pricing equations with respect to the credit condition variables. However, this explanation is not consistent with another finding. Note that this alternative story predicts the negative relationship between the

trust product size and the trust yield spread because the government would want to make a larger-size product, which would have bigger aftermath in case of default, less attractive. We find a positive relationship to the contrary.

Finally, Column (5) of Table 5 shows that the sample selection bias indeed exists in our sample. The estimation of the pricing equation without including the inverse Mills ratio results in the coefficient with an opposite sign (risk-free rate) or no significance (credit spread). This finding proves the importance of using the two-stage estimation procedure, which has not been considered in the previous studies about Chinese shadow banking.

5.2 Conditional analysis on the fund management style

It is plausible that depending on the fund management style, trust products are issued and priced differently. For example, a trust product whose fund is managed in the form of private equity must be riskier than a traditional loan-type trust product and trust companies' issue and pricing mechanism for these products may well differ. Indeed, Table 2 indicates that these two types of products show a non-negligible difference in the yield spread. To test this hypothesis, this subsection examines the issue and pricing decisions conditional on the fund management style. Specifically, we consider two groups: loan-type products and PE-type products, and conduct the 2-stage estimation of the sample selection model for each group. We choose these two groups because their observations are relatively abundant and their riskiness is clearly distinguished from each other by nature. The other product types jointly work as a benchmark.

Recall that for the unbiased estimation of the pricing decision equation, we need the "issue" dummy variable that indicates when trust firms decide to issue products. In the full-sample analysis, the issue indicator is defined based on the presence of rare types

of products. In this conditional analysis, however, there is only one type of relatively frequent products in each group. Hence, we define the "issue" indicator in a different way for the conditional analysis. We record $z_t^{\text{loan}} = 0$ ($z_t^{\text{PE}} = 0$) in month t if the number of issues of loan (PE)-type products in month t is less than the median of monthly issues in the sample, and $z_t^{\text{loan}} = 1$ ($z_t^{\text{PE}} = 1$) otherwise. However, a rapid growth of trust industry by the late 2000s makes it insensible to use a single median value for comparison in the whole sample period. To address this issue, we make separate comparisons in two periods: until 2010 and since 2011.[16] The descriptive statistics of these conditional "issue" indicators are presented in Table 3.

Table 6 shows the estimation results of the issue and pricing equations in the group of the loan-type products. Credit spread is the only common variable that has a significant effect on both equations. When credit spread increases (increased default risk), issue of the most traditional trust products (loan-type) tends to increase and the yield spreads of the loan-type products also rises. This finding is interpreted as the consequence of the increased supply of the loan-type trust products when credit spread rises. That is, when credit dries up in the market (credit spread spikes), trust companies tend to sell more traditional trust products to secure sufficient capital, and competition among trust companies drives up the yield spreads. When risk free rate falls, the issue of the loan-type trust products tends to increases, but the yield is not significantly responding when all factors are controlled. Also, when term spread falls, the probability of "issue" of the loan-type products does not significantly change. However, trust companies charges higher price (lower yield spreads). Next, Table 7 shows the results of the PE-type products in the issue and pricing equations. None of the common determinants is

[16] The median number of monthly issue for loan (PE)-type products is 9 (1) until 2010, but it has increased to 52 (10) since 2011. This division of the sample period is somewhat arbitrary, but the results are not qualitatively changed when we choose a different division point.

jointly significant in both equations, which indicates that prices of PE-type products are significantly influenced by neither investors' demand nor trust companies' supply. In an unreported table, we find that the other types of trust products exhibit the results qualitatively identical to the full-sample case.

The findings imply that while the main driving force for issue and pricing of the trust products is investors' demand, trust companies may also make decisions at their own discretion. They tend to sell the most traditional loan-type products when they need to secure necessary liquidity (supply-driven issue and pricing). The results of PE-type products are consistent with intuition in that the potential investment opportunities of private companies are not likely to be correlated with investors' demand for and/or trust companies' supply of trust products.

5.3 Blinder-Oaxaca decomposition

The results of the Blinder-Oaxaca decomposition is presented in Table 8. Panel A indicates that the trust yield spread has significantly decreased recently from 5.64% (January 2007 to December 2012) to 5.20% (January 2013 to March 2016) and it is mostly through the changes in market reactions (coefficients) rather than the changes in fundamentals.[17]

Column (1) of Panel B in Table 8 shows how the fundamental (determinants of the trust yield spread) have changed over time. Except for the term spread (and a few variables with economically small effects), most fundamentals moved in the direction of increasing the spread. Given the empirical findings in Table 5, the results suggests that recently the economic growth has slowed down (the real growth of industrial production

[17] We divide the sample period in this way for following reasons. First, the number of observations are well balanced (5,096 in the former subperiod and 6,468 in the latter subperiod. More importantly, a series of risk-controlling regulations had been issued throughout 2011 and they all came into effect by the end of 2012.

and PPI have decreased), while trust companies make use of more leverage and become more profitable.

Column (2) of Panel B in Table 8 shows the changes in market reactions with respect to given fundamentals. We find that the market begins to react less sensitively to most determinants since 2013. Specifically, the influence of risk-free rate and term spread became weaker, while the reaction to credit spread remains unchanged. This phenomenon makes sense if the "flight to quality" is virtually the only influence among credit conditions since 2013. The decline in the coefficients of trust size, firm size and ROA implies that investors' valuation for bigger trust products and the products issued by bigger and more profitable trust companies increases so that their products are issued at a lower discount. The reaction to maturity also changes such that investors value trust products with longer maturities, which can make sense if investors have the expectation of falling yields in the future. Overall, our results suggest that the variables that can reflect riskiness of trust products play a more important role in determining the trust yield spreads.

5.4 Time series analysis

To investigate the dynamics of the trust yield spreads, we model the VAR between the trust yield spreads and their determinants. Specifically, we consider the state vector Y_t with risk-free rates, credit spreads, term spreads, inverse Mills ratio, and the average trust yield spreads.[18] Figure 1 plots the impulse responses functions of the VAR results. Among the state variables, the shock in credit spread has the largest and the most immediate impacts on the trust yield spreads. Interestingly, when we use the equally-

[18]We add more state variables, such as real industrial productions and inflation rates, in the VAR system and also check all possible orders of state variables. The state vector Y_t turns out to be stationary in our sample. The results are robust to the order and combination of the state variables.

weighted average of trust yield spreads, the effect of the credit spread becomes weaker (not reported). This finding make sense because when the default risk hikes, the flight to quality tends to be more concentrated on the trust products with larger asset size. Therefore, the effect of the increased demand due to the widened credit spread can be more pronounced for the value-weighted average of the yield spreads.

With respect to the risk-free rate shock, the trust yield spreads decrease on the one hand because the trust yield spreads are the differences of trust yields and risk-free rate. On the other hand, as explained in the previous section, the higher risk-free rate induces lower demand for the trust products, which consequently causes lower prices (higher trust yield spreads) of the rust products. This dynamic pattern is well captured in the impulse response function to the risk-free rate shock, although it is not statistically significant. The shock in term spread and the inverse Mills ratio (unobserved demand) turn out to have delayed, rather than immediate, effects on the trust yield spread.

Finally, we analyze the forecasting error variance of the determinants for the trust yield spreads. The results are presented in Table 9 and Figure 2. Except for the shocks on the trust products themselves, credit spread explains the largest fractions of the forecast error variances. Throughout the forecasting horizons, it explains 12.04-16.02% of the total forecast error variance. In contrast, the contributions of risk-free rate (term spread) shocks to the forecast errors are almost zero in the short horizon, but they rises to 8.35% (10.70%) after about one year. This finding implies that it takes a couple of months for risk-free rates and term spreads to take effect, which is consistent with the results of impulse responses. To sum, the findings in the time-series analyses are consistent with those in the static analysis, but provides richer information.

6 Conclusion

This paper examine what determines the value of Chinese collective fund trust products, an important player in Chinese shadow banking. Given that the credit conditions have the opposite signs in issue and pricing equations with statistical significance, our results provide evidence that the issuance and pricing of the trust product is primarily driven by investor demand. Additionally, the price of the trust product has a tendency to decrease in recent years and the decline is due to changes in market reaction to fundamentals. Moreover, time series analyses show that the shock in credit spread has the largest and the most immediate impacts on the trust yield spread.

Holding other economic situations being fixed, safer products are issued at smaller yield spreads and more affordable trust companies offers higher yields for competition, which suggests that apparently ambiguous and ad hoc trust products are indeed priced based on risk and information.

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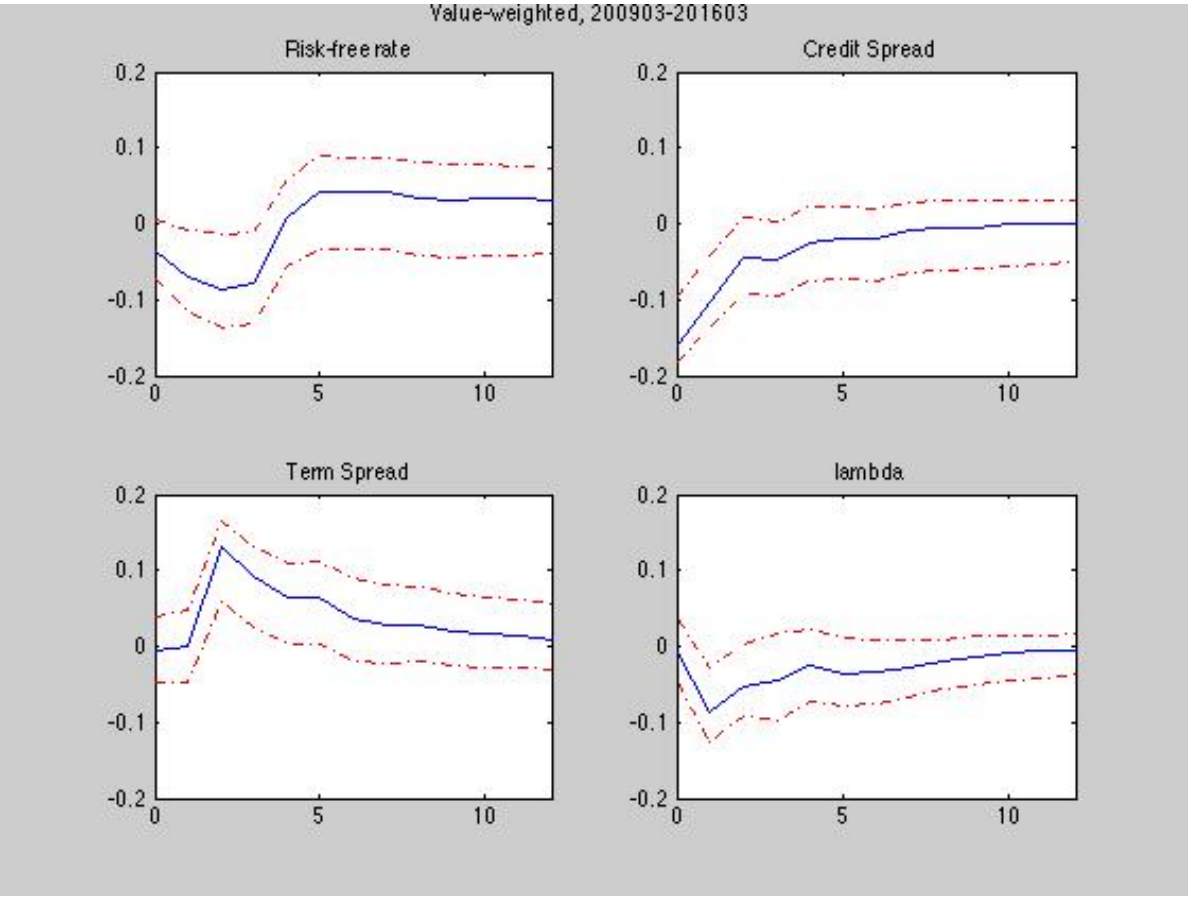
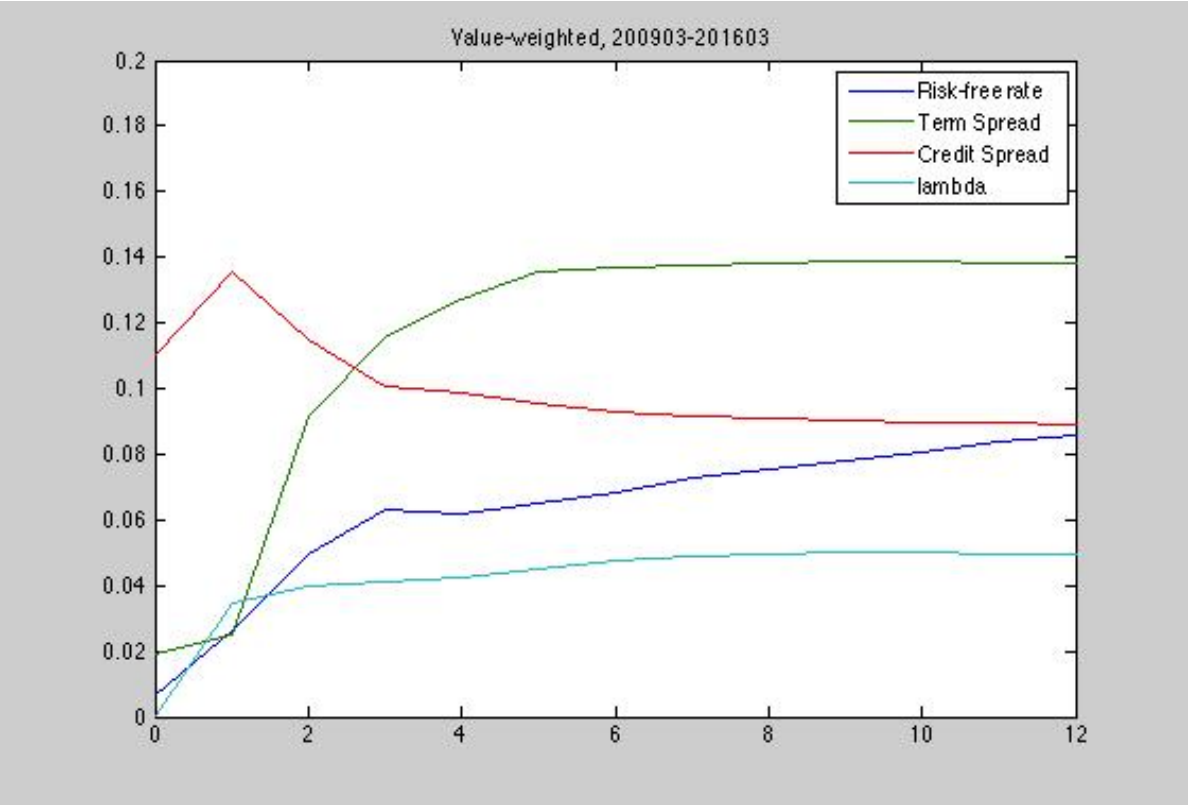
Figure 1: Impulse responses of the trust yield spread



Note: Figure 1 depicts the impulse responses of the trust yield spreads with respect to the one-standard-deviation shocks on risk-free rate, credit spread, term spread, and lambda (unobserved demand shock). The dotted lines indicate one-standard-deviation error bands formed from 1,000 bootstrapped observations. The vertical and horizontal axes represent percentage and month, respectively.

Figure 2: Decomposition of forecast error variances



Note: Figure 2 presents the extent to which the variances of the forecast error in the trust yield spreads are attributed to the shocks in risk-free rate, credit spread, term spread, lambda (unobserved demand shock), and other factors for various forecasting horizon.

Table 1: Growth in the Trust Industry in China

	2010	2011	2012	2013	2014	2015	2016Q1
Total trust AUM (Billion CNY)	3040	4811	7471	10907	13980	16304	16581
Collective-fund trust AUM (Billion CNY)	627	1359	1883	2715	4292	5344	5474
Proportion of collective-fund trust AUM	20.61%	28.25%	25.20%	24.90%	30.70%	32.78%	33.01%
Number of newly issued total trust products	8090	13427	16729	20672	36612	19396	4065
Number of newly issued collective-fund trust products	2505	5742	6167	6436	13656	7894	1264
Proportion of collective-fund trust issues	30.96%	42.76%	36.86%	31.13%	37.30%	40.70%	31.09%
Amount of newly issued total trust products (Billion CNY)	2247	3175	4533	5999	5867	6537	1736
Amount of newly issued collective-fund trust products (Billion CNY)	433	960	1016	1304	1571	2001	489.33
Proportion of collective-fund trust amount	19.27%	30.23%	22.42%	21.74%	26.79%	30.61%	28.18%

Note: Table 1 reports the assets undermanagement of collective fund trust products and its proportion in the entire trust industry. Also, it shows the number and size of collective fund trust products and their proportion in the total trust funds. The period is from 2010 to Q1:2016. The data is from China Trustee Association (www.trustee.org.cn)

Table 2: Descriptive Statistics: Cross-Sectional Variables

Variable	Mean	Median	Std. Dev.	Min	Max	Obs
Full sample						
IssuingFirmSize (million CNY)	4235	2999	7093	289	101370	11564
ROA (%)	14.684	14.090	7.180	-25.571	61.662	11564
LeverageRatio	1.257	1.126	0.401	1.001	4.123	11564
TrustYieldSpread (%)	5.397	5.464	1.387	-2.251	21.864	11564
Maturity (month)	22.948	24	15.140	1	480	11564
TrustProductSize (million CNY)	186	100	402	1	25000	11564
D_{City}	0.504	1	0.500	0	1	11564
D_{Loan}	0.336	0	0.472	0	1	11564
$D_{AssetRight}$	0.233	0	0.423	0	1	11564
D_{Bond}	0.125	0	0.331	0	1	11564
D_{PE}	0.077	0	0.267	0	1	11564
D_{Repo}	0.008	0	0.086	0	1	11564
D_{Lease}	0.004	0	0.063	0	1	11564
$D_{Portfolio}$	0.104	0	0.305	0	1	11564
Loan-type products only						
IssuingFirmSize (million CNY)	4270	3018	7672	289	101370	3884
ROA (%)	14.356	14.120	6.775	-25.571	61.662	3884
LeverageRatio	1.280	1.132	0.425	1.001	4.123	3884
TrustYieldSpread (%)	5.490	5.579	1.372	-1.7	12.6	3884
Maturity (month)	21.814	24	10.377	1	144	3884
TrustProductSize (million CNY)	161.382	100	222.189	1	3500	3884
D_{City}	0.476	0	0.500	0	1	3884
PE-type products only						
IssuingFirmSize (million CNY)	4265	2523	7352	318	101370	896
ROA (%)	15.577	14.573	8.259	-15.863	38.815	896
LeverageRatio	1.263	1.157	0.370	1.001	4.123	896
TrustYieldSpread (%)	5.954	5.961	1.580	-1.005	21.864	896
Maturity (month)	27.796	24	16.607	12	300	896
TrustProductSize (million CNY)	373.304	236.335	431.472	4.3	3237.5	896
D_{City}	0.452	0	0.498	0	1	896

Note: Table 2 presents the descriptive statistics of the characteristics of collective-fund trust products in the sample. Panel A describes the full sample, while Panel B (Panel C) describes only loan-type (private equity-type) trust products. For the definition and the source of each variable, see the Section 4.

Table 3: Descriptive Statistics: Time-Series Variables

Variable	Mean	Median	Std. Dev.	Min	Max	Obs
Credit conditions						
Riskfree (%)	3.765	3.895	1.264	1.211	6.127	111
CreditSpread (%)	1.374	1.417	0.324	0.276	2.113	111
TermSpread (%)	1.004	0.867	0.549	0.166	2.221	111
Macroeconomic activities						
IPg (%)	8.463	7.660	3.289	2.850	18.680	111
CPIg (%, monthly)	0.249	0.176	0.572	-0.913	2.6	111
PPIg (%, monthly)	0.015	0.000	0.705	-3.4	1.4	111
Equity pricing factors						
MKT (%, monthly)	0.929	1.49	9.332	-28.68	24.58	111
SMB (%, monthly)	0.901	0.42	6.322	-16.99	33.44	111
HML (%, monthly)	0.032	0.60	4.732	-14.29	10.97	111
Issue decision dummy						
Z	0.559	1.000	0.499	0	1	111
Z^{Loan}	0.524	1.000	0.502	0	1	111
Z^{PE}	0.657	1.000	0.485	0	1	111
Average trust yield spread of collective fund trust products						
TrustYieldSpread (%, EW)	5.336	5.462	0.884	2.631	7.595	111
TrustYieldSpread (%, VW)	5.542	5.579	1.608	0.475	16.911	111

Note: Table 3 presents the descriptive statistics of the credit conditions, equity pricing factors, macroeconomic activities, and the "issue" indicator during the sample period from January 2007 to March 2013. For the definition and the source of each variable, see the Section 4. This table also reports the descriptive statistics of the monthly yield spread time series. The monthly trust yield spread is calculated by the cross-sectional average of trust yield spreads of the trust products issued in a given month.

Table 4: Probit Estimation of Issue Decision

Variable	(1)	(2)	(3)	(4)
Credit conditions				
Riskfree	-0.632***	-0.608***	-0.625***	-0.614***
	(0.194)	(0.200)	(0.196)	(0.204)
CreditSpread	1.793***	1.764***	1.862***	1.868***
	(0.507)	(0.507)	(0.500)	(0.497)
TermSpread	-1.088***	-1.103**	-1.149***	-1.137**
	(0.407)	(0.487)	(0.405)	(0.486)
Macroeconomic activities				
Ipg		0.032		0.020
		(0.061)		(0.015)
CPIg		0.165		-0.012
		(0.238)		(0.022)
PPIg		-0.197		0.017
		(0.245)		(0.027)
Equity pricing factors				
MKT			0.020	0.016
			(0.015)	(0.063)
SMB			-0.012	0.177
			(0.021)	(0.242)
HML			0.020	-0.126
			(0.027)	(0.251)
Constant	1.153	0.807	1.099	0.857
	(1.034)	(1.114)	(1.064)	(1.141)
Obs.	111	111	111	111
Pseudo-R^2	10.94%	11.65%	12.70%	13.19%

Note: Table 4 tabulates the results of the probit estimation of Equation (2). The values in parenthesis are the corresponding robust standard errors. *** (**, *) indicates the 1% (5%, 10%) significance level. For the definition of variables, see the Section 4.

Table 5: Least Square Estimation of Pricing Decision

Variable	(1)	(2)	(3)	(4)	(5)
Credit conditions					
Riskfree	0.024	0.035	0.086*	0.122**	-0.062***
	(0.046)	(0.049)	(0.046)	(0.048)	(0.021)
CreditSpread	-0.354**	-0.219	-0.555***	-0.489***	0.006
	(0.139)	(0.142)	(0.139)	(0.142)	(0.085)
TermSpread	0.517***	0.818***	0.575***	0.938***	0.548***
	(0.090)	(0.110)	(0.090)	(0.108)	(0.044)
Characteristics of trust companies and products					
Ln(FirmSize)			-0.163***	-0.229***	-0.226***
			(0.020)	(0.019)	(0.020)
ROA			0.008***	0.006***	0.006***
			(0.002)	(0.002)	(0.002)
LeverageRatio			0.313***	0.352***	0.349***
			(0.037)	(0.036)	(0.036)
Maturity			-0.002	-0.001	-0.001
			(0.002)	(0.002)	(0.002)
Ln(TrustSize)			0.244***	0.253***	0.251***
			(0.015)	(0.015)	(0.015)
D_{City}			-0.031	-0.034	-0.035
			(0.028)	(0.027)	(0.027)
Macroeconomic activities					
IPg		-0.044***		-0.060***	-0.042***
		(0.012)		(0.012)	(0.011)
CPIg		0.052*		0.037	0.081***
		(0.031)		(0.030)	(0.029)
PPIg		-0.420***		-0.436***	-0.486***
		(0.038)		(0.038)	(0.036)
λ	-0.289***	-0.367***	-0.350***	-0.503***	
	(0.109)	(0.125)	(0.108)	(0.124)	
Trust Style					
D_{Loan}	0.399***	0.439***	0.363***	0.422***	0.420***
	(0.051)	(0.051)	(0.051)	(0.051)	(0.051)
$D_{AssetRight}$	0.366***	0.394***	0.335***	0.370***	0.365***
	(0.052)	(0.052)	(0.053)	(0.053)	(0.053)
D_{Bond}	0.439***	0.428***	0.361***	0.372***	0.370***
	(0.053)	(0.052)	(0.055)	(0.054)	(0.054)
D_{PE}	0.856***	0.963***	0.608***	0.734***	0.731***
	(0.070)	(0.070)	(0.072)	(0.071)	(0.071)
D_{Repo}	0.207	0.280*	0.076	0.168	0.174
	(0.153)	(0.150)	(0.152)	(0.148)	(0.148)
D_{Lease}	-0.576***	-0.601***	-0.423**	-0.437**	-0.467**
	(0.197)	(0.190)	(0.197)	(0.185)	(0.185)
$D_{Portfolio}$	-0.212***	-0.185***	-0.173***	-0.097	-0.103*
	(0.059)	(0.059)	(0.060)	(0.059)	(0.059)
Constant	5.299***	5.094***	2.445***	2.980***	2.861***
	(0.100)	(0.108)	(0.340)	(0.348)	(0.346)
Obs.	11564	11564	11564	11564	11564
R^2	6.04%	8.55%	9.62%	12.59%	12.47%

Note: Table 5 tabulates the results of the least squares estimation of Equation (3). The values in parenthesis are the corresponding robust standard errors. *** (**, *) indicates the 1% (5%, 10%) significance level. For the definition of variables, see the Section 4.

Table 6: Conditional Analysis on Loan-type Products

	Issue Decision			Pricing Decision	
Variable	(1)	(2)	Variable	(1)	(2)
Credit conditions					
Riskfree	-0.335*	-0.375*	Riskfree	-0.322***	-0.074
	(0.188)	(0.211)		(0.046)	(0.048)
CreditSpread	1.510***	1.670***	CreditSpread	1.370***	0.474***
	(0.452)	(0.471)		(0.171)	(0.172)
TermSpread	0.071	-0.450	TermSpread	0.145**	0.707***
	(0.390)	(0.529)		(0.072)	(0.101)
Macroeconomic activities					
Ipg		0.102	Ipg		-0.082***
		(0.064)			(0.019)
CPIg		-0.114	CPIg		0.084
		(0.230)			(0.052)
PPIg		0.129	PPIg		-0.567***
		(0.234)			(0.055)
Equity pricing factors			*Trust companies and products*		
MKT		0.030**	Ln(FirmSize)		-0.243***
		(0.014)			(0.031)
SMB		-0.023	ROA		0.003
		(0.020)			(0.003)
HML		-0.015	LeverageRatio		0.401***
		(0.029)			(0.052)
			Maturity		0.009***
					(0.002)
			Ln(TrustSize)		0.241***
					(0.023)
			D_{City}		-0.015
					(0.043)
			λ	0.829***	-0.029
				(0.091)	(0.119)
Constant	-0.842	-1.220	Constant	4.042***	2.964***
	(1.019)	(1.174)		(0.222)	(0.588)
Obs.	111	111	Obs.	3884	3884
Pseudo-R^2	8.61%	14.70%	R^2	3.80%	12.12%

Note: Table 6 presents the two-stage estimation results of the issue and pricing decisions for loan-type trust products. The first two columns show the results of the probit estimation of Equation (2), while the last two columns show the results of the least squares estimation of Equation (3). The values in parenthesis are the corresponding robust standard errors. *** (**, *) indicates the 1% (5%, 10%) significance level. For the definition of variables, see the Section 4.

Table 7: Conditional Analysis on PE-type Products

	Issue Decision			Pricing Decision	
Variable	(1)	(2)	Variable	(1)	(2)
Credit conditions					
Riskfree	0.063	-0.083	Riskfree	0.127	0.109
	(0.193)	(0.202)		(0.087)	(0.095)
CreditSpread	1.036***	1.304***	CreditSpread	-0.027	0.029
	(0.462)	(0.487)		(0.347)	(0.372)
TermSpread	0.582	0.261	TermSpread	0.653***	0.429**
	(0.408)	(0.504)		(0.201)	(0.188)
Macroeconomic activities					
Ipg		-0.003	Ipg		-0.008
		(0.016)			(0.074)
CPIg		-0.022	CPIg		0.027
		(0.024)			(0.146)
PPIg		-0.071**	PPIg		-0.142
		(0.032)			(0.219)
Equity pricing factors			*Trust companies and products*		
MKT		0.018	Ln(FirmSize)		-0.561***
		(0.069)			(0.090)
SMB		0.288	ROA		0.013**
		(0.253)			(0.007)
HML		0.504*	LeverageRatio		0.757***
		(0.273)			(0.203)
			Maturity		0.008
					(0.007)
			Ln(TrustSize)		0.064
					(0.067)
			D_{City}		-0.192*
					(0.103)
			λ	0.530*	0.582
				(0.282)	(0.538)
Constant	-1.895*	-1.533	Constant	4.632***	9.330***
	(1.056)	(1.132)		(0.587)	(1.832)
Obs.	111	111	Obs.	896	896
Pseudo-R^2	5.97%	16.51%	R^2	1.93%	10.42%

Note: Table 7 presents the two-stage estimation results of the issue and pricing decisions for PE-type trust products. The first two columns show the results of the probit estimation of Equation (2), while the last two columns show the results of the least squares estimation of Equation (3). The values in parenthesis are the corresponding robust standard errors. *** (**, *) indicates the 1% (5%, 10%) significance level. For the definition of variables, see the Section 4.

Table 8: Oaxaca Decomposition

Panel A: Summary of Decomposition			
	200701-201212	201301-201603	Difference
Change in Yield Spreads	5.640	5.205	-0.435
	(0.021)	(0.016)	(0.026)
Decomposition of Yield Spreads	Fundamental	Market reaction	Interaction
	0.049	-0.582	0.097
	(0.041)	(0.062)	(0.070)
Panel B: Decomposition with determinants)			
	(1) Fundamental	(2) Market reaction	(3) Interaction
Riskfree	0.058***	-1.188***	-0.038**
	(0.013)	(0.435)	(0.015)
CreditSpread	0.091***	-0.681	0.062
	(0.030)	(0.476)	(0.043)
TermSpread	-0.388***	-0.360*	0.102*
	(0.042)	(0.201)	(0.057)
Ln(FirmSize)	-0.033	-1.695***	-0.113***
	(0.023)	(0.473)	(0.032)
ROA	0.042***	-0.173***	-0.036***
	(0.007)	(0.050)	(0.010)
LeverageRatio	0.019***	-0.072	-0.003
	(0.004)	(0.098)	(0.004)
Maturity	0.001	-0.242***	-0.003
	(0.002)	(0.037)	(0.003)
Ln(TrustSize)	-0.022***	-2.347***	0.008***
	(0.007)	(0.467)	(0.003)
D_{City}	-0.002	-0.050**	-0.004*
	(0.002)	(0.025)	(0.002)
IPg	0.232***	-0.138	0.040
	(0.038)	(0.264)	(0.077)
CPIg	0.001	-0.008	0.003
	(0.005)	(0.016)	(0.006)
PPIg	0.088***	-0.008***	0.083***
	(0.017)	(0.003)	(0.023)
λ	-0.038***	-0.053	-0.004
	(0.011)	(0.171)	(0.013)
Constant		6.433***	
		(0.656)	

Note: Table 8 tabulates the summary (Panel A) and the details (Panel B) of the Oaxaca decomposition result. In Panel B, the column of (1) *Fundamentals* indicates the contribution of changes in determinants, while the column of (2) *Market Reactions* indicates the contribution of changes in coefficients. The column of (3) *Interaction* indicates their joint contribution. The values in parenthesis are the corresponding robust standard errors. *** (**, *) indicates the 1% (5%, 10%) significance level. For the definition of variables, see the Section 4.

Table 9: Variance Decomposition of Trust Yield Spreads

Forecasting Horizon	Riskfree	CreditSpread	TermSpread	λ	TrustYieldSpread
1	0.67%	12.99%	0.01%	0.05%	86.28%
2	2.65%	16.02%	0.01%	3.44%	77.88%
3	4.95%	14.26%	6.38%	3.95%	70.46%
4	6.34%	13.29%	8.38%	4.14%	67.85%
5	6.21%	13.15%	9.45%	4.26%	66.94%
6	6.51%	12.78%	10.33%	4.52%	65.86%
7	6.86%	12.56%	10.44%	4.75%	65.39%
8	7.29%	12.41%	10.51%	4.91%	64.88%
9	7.55%	12.28%	10.63%	4.97%	64.56%
10	7.79%	12.21%	10.67%	4.99%	64.34%
11	8.08%	12.14%	10.69%	4.99%	64.10%
12	8.35%	12.09%	10.70%	4.98%	63.89%
13	8.61%	12.04%	10.68%	4.97%	63.70%

Note: Table 9 shows the variances of the forecast error in the trust yield spreads. The shocks in risk-free rate, credit spread, term spread, λ (unobserved demand shock), and other factors to the forecasting error variation for various forecasting horizon are reported.