

Case Study: The Credit Default of China's Chaori Solar Bond

By Dr. Yongqiang Bu

The first credit default event in the history of Chinese bond market occurred in 2014. The “11 Chaori Solar Bond,” a public bond offering, failed to pay promised interests in full, and four other private SME bonds followed suit.

With the credit default of the 11 Chaori Solar Bond, the once-unshakable belief in rigid payment of credit bonds, especially public ones, began to waver among Chinese bond investors. It quickly became a subject of wide attention in the market.

Since that event, the frequency of credit bond default occurrences, the number of entities affected and the amounts involved have been on the rise, year-by-year. As of the end of October 2019, 340 bonds from 111 issuers in the Chinese credit bond market defaulted on interest distribution materially, and the default principal has added up to RMB 318.9 billion, or about 1.51% of the Chinese non-financial credit bond market totaling RMB 21 trillion.

Although the eventual interest payment percentage of the 11 Chaori Solar Bond was quite high, the incident has been remembered as the first defaulting public bond in China, with 2014 the starting point. From that point forward, conducting in-depth studies and analyses of causes behind credit defaults has become an essential job for financial practitioners in China.

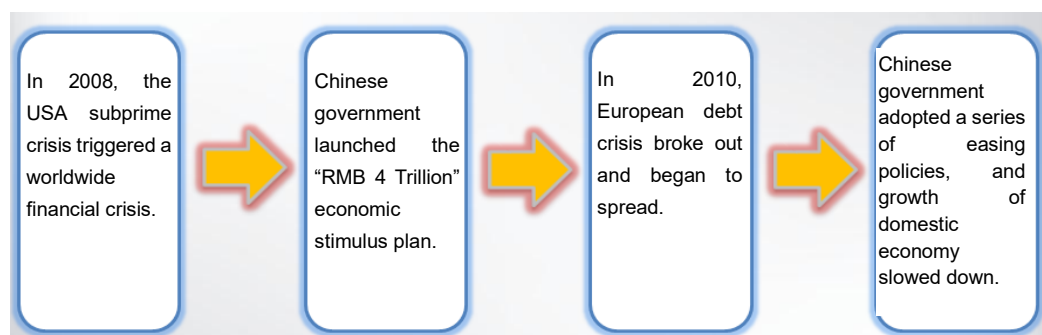
Several major factors have led to the increase in defaults, including corporate operation conditions (both industrial factors and corporate operation factors), refinancing difficulties, corporate governance structure problems, and aggressive overseas investment or blind expansion. In this paper, we will delve into the default case of the 11 Chaori Solar Bond, which occurred initially due to the cancellation of industrial subsidies.

Background

In response to the 2008 financial crisis, the Chinese government launched a “RMB 4 Trillion” stimulus plan at the end of that year. In 2009, the M2 index was up a respectable 27%, and the average increase was above 17% in the following years.

Concurrent with rapid expansion of the central bank’s balance sheets, those of individual firms in the real economy were also booming, which led to a rapid growth in credit issuance in those years. The economic stimulus policies enacted from 2008 to 2010, and subsequent years, are depicted in Figure 1. (Starting from 2016, this trend was reversed, as the Chinese government began to resort to tightening policies designed as a correction of the “RMB 4 Trillion” plan issued in 2008. The subsequent supply-side reforms and deleveraging measures were aimed at eliminating the economic bubbles appearing since 2008.)

Figure 1: Macro Events and Evolution of Economic Policies



In the period from 2002-2011, driven by favorable policies adopted in many countries, the global photovoltaic (PV) industry prospered. Chinese PV enterprises raced into U.S. and EU markets to take full advantage of subsidies offered by governments in America and Europe. In China, over the same period, explicit development goals of PV power were put forward in the *Development Plan to Revitalize New Energy industries*, leading the domestic PV sector into a boom.

After 2012, due to the financial crisis and the European debt crisis, European and American countries set about cutting PV subsidies and implementing antidumping and anti-subsidy policies. As a result, the growth rate of emerging PV markets around the world became quite slow, and over 90% Chinese PV enterprises were forced to suspend production – resulting in a concentrated outbreak of overcapacity, declining product prices, business difficulties, and frequent defaults in the photovoltaic industry.

In the period between 2013 and 2017, the Chinese government launched a series of favorable policies for the PV industry, including expanding the coverage of PV subsidies, providing government grants, and encouraging private investment in the energy sector. At the same time, the rise of new PV markets (like Japan) reversed the unfavorable relationship between supply and demand. Consequently, the PV industry recovered.

It should be noted, however, that the development of the PV industry is mainly affected by policies, and technology iteration is rapid. Therefore, with the more efficient capacity continues to be put into production, financially weak SMEs that are unable to upgrade production facilities will face more survival pressure.

With the release of the *Notice about Issues Related to PV Power Generation* in 2018, and a series of policies promulgated in 2019, the Chinese government took measures to implement supply-side structural reform. The gist of these policies is to gradually reduce and remove subsidies and realize grid parity, eventually. In this context, some PV companies with overcapacity and backward technologies have defaulted.

The Rise of the Chaori Solar Bond

The Shanghai Chaori Solar Energy Science & Technology Co. – a high-tech private enterprise engaged in research, development, and utilization of solar energy resource – was founded in 2003.

In September 2010, the company was listed on SME board of Shenzhen Stock Exchange. In 2011, the company received approval from the China Securities Regulatory Commission (CSRC) to issue bonds worth no more than RMB 1 billion. On March 7, 2012, Chaori Solar issued a five-year bond (the “11 Chaori Solar Bond”) with a total value of RMB 1 billion and a nominal interest rate of 8.98% at Shenzhen Stock Exchange.

The interest payment date of the second phase of the bond was originally scheduled on March 7, 2014. On March 4, 2014, however, company issued a public statement stating that it would not be able to pay the full due interests of RMB 89.8 million; rather, it would only be able to pay RMB 4 million, because of uncontrollable factors.

The market quickly burst into an uproar. Later, after the debt restructuring by various parties, investors actually got a high repayment rate and almost bore no loss. But the default of the 11 Chaori Solar Bond remains a legendary incident in the domestic bond market.

Default Analysis

After cutbacks of subsidies for PV industry by European and American countries following the financial crisis, the whole industry was plagued by a downturn. Chaori suffered consecutive losses in 2011 and 2012, mainly due to impairment of accounts receivable and exchange loss.

The company became insolvent at the end of 2013, as losses continued to erode its net assets. At the beginning of 2014, the company's bank loans were overdue, and was sued by many suppliers and banks. A large number of production lines were suspended, and major bank accounts and assets were frozen or pledged by creditors.

In terms of corporate bonds, in July 2013, the 11 Chaori Solar Bond was suspended from listing, due to losses for two consecutive years. On the evening of March 4, 2014, the company announced that it could not pay the current interest of the 11 Chaori Solar Bond, which was scheduled to be paid in full on July 7; this constituted the first substantial default in the bond market. Later, the

11 The Chaori Solar Bond and the company stock of the company were delisted in May 2014, because of three consecutive years of losses.

In fact, before the default incident of the 11 Chaori Solar Bond, a few credit events and payment crises had already taken place in the public offering bond market. But, eventually, all of them were successfully resolved with appropriate payments. That's why China's bond market remained largely unaffected (at the time) by the following developments in the 11 Chaori Solar Bond:

1. Data changes before and after bond issuance.

There are certain financial requirements for the issuance of bonds in the public market of China. Obviously, Chaori was qualified before the issuance of its 11 Chaori Solar Bond, but its financial data subsequently deteriorated considerably (see Table 1 in the annex).

Taking the profit as an example, Chaori's net profit dropped from RMB 210 million in 2010 to -50 million in 2011, and then to -1.74 billion and -1.49 billion in 2012 and 2013, respectively.

These dramatic changes occurred soon after the issuance of the 11 Chaori Solar Bond. One week ahead of the issuance, Chaori Solar predicted an annual profit of more than RMB 82 million for 2011, and consequently was greatly welcomed by the bond market.

In a performance amendment notice released one month after the issuance, the expected 2011 profit was reduced by RMB 142 million, to a negative level. As for solvency indicator, the company's solvency ratio was well above the accepted standard in 2010, and its asset-liability ratio was within the safe range of 31.31%.

In 2011, however, these indicators deteriorated rapidly, most notably when its debt-to-asset ratio crossed the 50% red line, reaching 56.41%. This ratio further climbed to over 100% by the end of 2013. In other words, the company would not have been able to pay off its debts even if it had sold all of its assets.

The financial situation of the company was dire. Chaori's funds-at-book were 209 million at the end of 2012, 60 million at the end of 2013, and 50 million

at March 2014. Simply put, at the end of 2012, it had 209 million on its book, so it should have been no problem for Chaori to pay the interest it owed in early 2013. However, at the end of 2013, its funds-at-book were only 60 million, and there was therefore no way for Chaori to pay its interest of 89.8 million.

2. Blind overseas expansion.

In the years before 2009, sales of Chaori Solar in foreign markets grew sharply, and over 95% of its silicon solar components were sold overseas. The financial crisis and the European and American anti-dumping and countervailing investigations against China's photovoltaic enterprises had greatly reduced the overseas market of China's new energy industry.

To turn the situation around, Chaori adopted a very aggressive business transformation mode to capture the international market share. It extended from the mid-stream component production to the upstream silicon material and the downstream power station, and the power station eventually became the focus of its transformation.

In 2011, a fully-owned subsidiary of Chaori Solar was set up in Hong Kong, and within one year its registered capital increased from EUR 28 million to EUR 88 million. Thereafter, Hong Kong Chaori Solar opened some holding subsidiaries in Italy, Luxemburg and the U.S.

These overseas subsidiaries invested in dozens of power station projects overseas through partnerships with other companies. The subsidiary in Luxemburg, for example, chose to cooperate with the Sky Solar Group, a company qualified for and highly experienced in construction of overseas power stations. A joint venture was set up with Sky Solar to build power stations.

The Luxemburg subsidiary was responsible for providing PV components and funds, while Sky Solar was responsible for selecting sites, construction and operation of the power station. Once completed, the power station would be sold to the joint venture controlled by the Chaori Solar's Luxemburg subsidiary.

In its accounting practice, Chaori Solar recorded its own component

investments as sales income – a so-called innovation. What the company expected was business expansion through internal sales. However, since power station projects required huge investments and a long lead time, that cost is not possible to be recovered before project completion.

Consequently, Chaori's total amount of accounts receivable grew huge. As depicted in Table 1, total accounts receivable grew RMB 649 million in 2010 to RMB 2.21 billion in 2011. Since then, the company's account receivable indicators remained high.

The aggressive overseas investments and subsequent bleak European and American markets led to Chaori's tremendous losses and liquidity difficulties. In 2012, the operating income of the company was halved, decreasing from RMB 3.33 billion in 2011 to RMB 1.63 billion. Meanwhile, the amount of accounts receivable (RMB 2.14 billion) was still quite high.

In 2013, the operating income was merely RMB 550 million, and the amount of accounts receivable were RMB 1.47 billion. According to Chaori's financial statements for the first three quarter of 2012, its total current liabilities reached RMB 3.67 billion. Although its current assets were RMB 5.35 billion in value, 62.5% of those assets (RMB 3.34 billion) were accounts receivable, implying that the company's assets available for debt payment, at the time. were only RMB 2 billion.

Chaori also experienced significant decreases in its turnover rate of accounts receivable after 2011. Its inventory turnover rate followed the same trajectory. In March 2012, these two ratios were 0.23 and 0.52, respectively, both far lower than industrial average.

The apparent reason for Chaori's bond default lies in the capital chain rupture caused by its delayed collection of accounts receivable, while the fundamental reason lies in its blind and excessive overseas investment. Its asset-liability ratio was 84.63% at the end of 2012, 104.44% at the end of 2013 and 106.46% at March 2014.

Downgrade

The aggressive operations and irregular financial operations of Chaori Solar failed to receive adequate attention from the bond market. In July 2011, it won an AA credit rating with a stable outlook.

Even in the middle of 2012, this rating remained unchanged, with overweight recommended. But on April 10, 2013, one month after Chaori Solar's statement about its inability to fully pay its dividend, its investment credit rating was changed to BBB. Moreover, it was further downgraded to CCC in the following month (see Table 2 in the annex).

Worse still, the company's creditors didn't take any actions to reverse the trend. Neither did they restrain the aggressive behaviors of Chaori Solar by voting, nor sell and cause any change in the bond price.

China's PV industry heavily relies on foreign resources, particularly with respect to the raw material (polysilicon), the technical equipment needed for import, and nearly all of the PV cell modules used for export.

After 2007, Chinese production capacity of polysilicon and PV components expanded drastically. On the demand side, however, the subprime crisis and the European debt crisis made the financing for solar power stations very difficult in many European countries.

The situation was compounded by the adjustments of public power generation subsidy policies. As a result, the market demand shrunk significantly, causing the price of polysilicon and PV components to nosedive. Huge operational and financial pressure hit the Chinese PV manufacturers, which had been busy with massive global expansion.

This industrial downturn was already evident in 2012, the year when the 11 Chaori Solar Bond was issued. However, the annual statements of the company indicated an acceptable profitability forecast. What's more, its gross profit ratio was better than most of its peers, which was attributed to its direct

selling to power stations.

Amid the industry-wide downturn, Chaori Solar managed to maintain a positive book profit by operating within its business model. The resulting drastic increases in accounts receivable, nonetheless, brought tremendous risks to the company, including rapid deterioration of cash flow and inability to recover funds.

In retrospect, this directly led to the shocking changes in Chaori Solar's performance. According to the financial statements for the first three quarters of 2011, published around the date of issuing the bond, Chaori's total amount of accounts receivable was RMB 2.09 billion, accounting for 35% of its total assets.

The loss suffered by the company at the end of 2011 was a direct result of the provision for bad debts that reduced its operating profit by RMB 107 million. In 2012, the loss was 1.75 billion yuan due to the provision for bad debts and the poor operation. In fact, Chaori's auditor, Pan-China Certified Public Accountants, issued a qualified opinion regarding the company's 2011 annual statement, pointing out issues of related party receivable and sales confirmations.

What's more, at that time, most of Chaori's top 10 shareholders – who hold more than 50% of its shares – were relatives of the company's controller.

Conclusion

In October 2014, the repayment scheme for the 11 Chaori Solar Bond was finalized. All amounts not exceeding RMB 200,000, due to ordinary creditors, would be fully paid; for parts exceeding RMB 200,000, 20% would be paid.

This settlement was made possible because that the local government intervened administratively, and because the China Great Wall Asset Management Co., Ltd., and Shanghai Jiuyang Investment Management Center granted a letter of guarantee.

Afterwards, nine companies (led by GCL Energy Co., Ltd.) took over Chaori Solar together, offering certain repayment funds. Perhaps unexpectedly,

after a debt evaluation, it was determined that the majority shareholders and operators of Chaori Solar did not bear financial or civil liability for their mismanagement or even suspected fraud.

The repayment scheme for Chaori Solar Bond again highlighted the long-standing issues of rigid payment in Chinese bond market. Rigidity not only does not help to improve the awareness of credit default risk in the market but also increases the probability of default in China's bond market. This is because both creditors and debtors believe that even in the case of credit default, a minimum guarantee will be provided by the government, banks, or guarantee companies.

As a consequence, debtors have higher risk appetite and are prone to borrow more money. Moreover, their cost of financial distress can be reduced by such a concept, making them less willing to restrain their operation behaviors and deal with funds in a prudent way.

For creditors, rigid payments also reduce their incentive to monitor borrowers. In sum, it can be seen from the case of Chaori Solar Bond that defaults in Chinese bond market are too low in cost to draw practical lessons from. This is completely to the disadvantage of future credit risk management in this market.

Before the default of Chaori bonds, there were many credit events in the bond market, including the payment crises of debentures and short-term financing bonds issued by Shandong Hailong, LDK Solar, and Xinzhongji. But all of them were finally settled by local government and affiliated state-owned enterprises (see Table 3).

For investors, one of the practical implications of a debt default is the reassessment of credit risk it could trigger: a break in rigid expectations for repayment could prompt a correction in the prices of risky assets, such as credit bonds and even stocks. In the aftermath of the Chaori default, low-rated bonds were frowned upon, while high-credit bonds with short maturity became a preferred choice. This trend did not completely change until another wave of bond defaults broke out in 2018-2019.

The market has since become “one-size-fits-all,” making it difficult for private companies to raise capital. In addition, the credit risks of companies that rely on industry subsidies must be monitored.

It remains to be seen whether the alternative fuel vehicle industry will repeat the fate of the PV industry. From this Chaori case, we should have also learned the following lessons:

1. *Investors should focus on rating results.* For investors, a major practical point is the possibility that the default on the interest payment of Chaori debt may trigger the credit risk, due to the revaluation. When guaranteed interest redemption expectations are broken, the price of credit assets and even risky assets, such as stocks, may usher in adjustments.

It is because of guaranteed interest redemption that bond ratings are largely ignored. The fundamental significance of ratings is the assessment of solvency and willingness to pay.

A CCC rating, for example, means low security and very high risk of default. Although ratings can sometimes be biased, respect for ratings is needed. Chaori had 60 million funds at the end of 2013, but only paid out RMB 4 million in interest – demonstrating a problem with its willingness to pay debts. In addition, companies with excessive asset-liability ratios should be avoided by investment institutions.

2. *Debt repayment guarantee measures must be strictly reviewed.* Before the 11 Chaori Solar Bond was issued, to provide protection for the principal and interest repayment of the bond, Chaori signed a "Liquidity Loan Support Agreements" with CITIC Bank Suzhou Branch and Guangfa Bank Shanghai Branch, worth a total amount of RMB 800 million.

The agreements stipulated that the banks would grant liquidity support loans when temporary bond liquidity was insufficient for the bond interest payment and principal

payment. According to the main content of the above agreements and relevant disclosures in the prospectus, the agreements would be triggered when temporary liquidity of debt repayment was insufficient.

The agreements' essence is to provide further guarantee through liquidity support loans, with a total amount of not more than 800 million yuan for the principal and interest repayment of "11 Chaori Bond."

When the material default happened, Chaori formally submitted an execution application to the aforementioned two banks on March 7, 2014. However, the banks verbally stated that the "Liquidity Loan Support Agreement" is a loan support that can only be given when Chaori has insufficient liquidity for temporary interest payments on bond and principal payments, and elaborated that what happened to Chaori was not a "temporary insufficient" of the liquidity of funds but, rather, a complete loss of credit due to the break in the capital chain. The liquidity loan application submitted by Chaori was therefore difficult to execute.

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Annex

Table 1: Main operation and solvency indicators of Chaori in 2010-2013

Year	2010	2011	2012	2013
Operating income (RMB ten thousand)	268664.93	333258.10	163796.70	55192.74
Net profit (RMB ten thousand)	21941.91	-5548.69	-174495.68	-149900.45
Basic earnings per share (RMB)	0.84	-0.1	-1.99	-1.72
Main operation margin (%)	9.65	-1.09	-108.1	-253.12
Cash flow per share (RMB)	5.21	-3.82	-0.47	-0.07

Current ratio (times)	3.16	1.25	0.72	0.55
Quick ratio (times)	2.95	1.02	0.42	0.33
Asset-liability ratio (%)	31.31	56.41	84.63	104.44
Account receivable (RMB ten thousand)	64993.78	221079.98	214020.82	14361.36
Other account receivable (RMB ten thousand)	12912.96	34297.78	29307.85	17821.67

Table 2: A brief timeline review of the default event of the 11 Chaori Solar Bond

Date	Event
March 7, 2012	Shanghai Chaori Solar Energy Science & Technology Co., Ltd. ("the Company") issued a bond with a total value of RMB 1 billion. Among the fund raised, RMB 400 million was used for repaying bank loan, and the remaining served as a supplement to the Company's current capital.
April 26, 2012	The Company published 2011 annual statements, indicating a total loss of RMB 55 million.
June 28, 2012	Pengyuan Credit Rating maintained the AA subject rating for the Company, but changed it outlook to negative.
October 2012	After a special inspection on 2011 annual statements of the Company, CSRC Shanghai Regulatory Bureau issued a rectification order, pointing out that the Company had not fully disclosed information contained in <i>Power Station Company Management Agreement</i> and information on overseas power station guarantee.
November 2, 2012	Shenzhen Stock Exchange circulated a notice of criticism, stating that the Company failed to follow a standard information disclosure procedure in terms of performance prediction, power station project, and changes of purpose of funds raised. The Company and its chairman, general manager, CFO, and board secretary were criticized.
December 26, 2012	There was a rumor that Ni Kailu, chairman of the Company, absconded with money, but the Company responded that he was busy with collection of receivables abroad.
December 27, 2012	Ni Kailu, chairman & general manager of the Company, resigned from the post of general manager.
December 27, 2012	Pengyuan Credit Rating downgraded the subject rating of the Company from AA to AA-.

December 29, 2012	The Company issued a public notice, acknowledging resignation of the general manager, shutdown of some production lines, outstanding payments, and lawsuit instituted by suppliers. It was also mentioned in the notice that the chairman was fulfilling his duty normally.
December 29, 2012	Pengyuan Credit Rating set the subject rating of the Company and the credit rating of 11 Chaori Solar Bond to AA-, and included them in the list of Credit Watch.
January 16, 2013	At the request of China Securities, trustee of 11 Chaori Solar Bond, the board of the Company passed a resolution to use parts of accounts receivable, machine equipment, and real estate to secure the bond.
January 22, 2013	CSRC Shanghai Inspection Bureau instituted an investigation into the Company due to its failure in following standard information disclosure procedures.
March 2, 2013	The Company released a public announcement about dividend payment for 11 Chaori Solar Bond.
April 10, 2013	Pengyuan Credit Rating downgraded the Company's subject rating and credit rating of 11 Chaori Solar Bond to BBB+.
April 27, 2013	The Company published 2012 annual statements, indicating a total loss of RMB 1.752 billion. The two-year loss triggered an alarm for stock delisting.
May 2, 2013	11 Chaori Solar Bond was suspended.
May 18, 2013	Pengyuan Credit Rating downgraded the Company's subject rating and credit rating of 11 Chaori Solar Bond to CCC.
February 28, 2014	The Company published a preliminary performance statement, showing that the net profit of shareholders of the Company would suffer a loss of RMB 1.331 billion.
March 4, 2014	The Company announced that it was not able to pay the promised dividend of 11 Chaori Solar Bond in full.

Table 3: Other payment crises ahead of the default event of Chaori Solar Bond

Time	Bond	Subject of event	Event	Solution
January 2014	11 Changzhou SME Bond	Wintafone Chemical	Bankruptcy reorganization of Wintafone Chemical	The principal and interest (RMB 36.89 million) were paid by Changzhou Qinghong Chemical Co., Ltd. as the counter-guarantee provider.
January 2014	11 Yangpu	TJ Innova	Difficult debt	Allotment of shares

	SMECN1	Engineering & Technology	payment by TJ Innova Engineering & Technology	among shareholders
December 2012	11 Changzhou SMECN II 001	Gaoli Color Steel	The assets of Gaoli Color Steel were seized	Payment of principal and interest ahead of schedule
December 2012	10 Heilongjiang SMECN1	Huijiabei	Difficult debt payment by Huijiabei	The principal and interest (RMB 7.08 million) were paid by Shenzhen Credit Guarantee Group
October 2012	10 Jingjingkai SMECN1	BKE	Difficult debt payment by BKE	The principal and interest (RMB 20.53 million) were paid by the guarantor Beijing Capital Financing Guarantee Co., Ltd.
September - October 2012	11 Xinzhongji CP001	Xinzhongji	Xinzhongji was downgraded	It was possible that the principal and interest were paid by Xinjiang Production and Construction Corps
April - October 2012	11 Jiangxi LDK SolarCP001	Jiangxi LDK Solar	Jiangxi LDK Solar was downgraded consecutively	It was possible that the principal and interest were paid with local government grant or bank loan.
January 2012	10 Zhongguancun Debt	Dijie Communication	Difficult debt payment by Dijie Communication	The principal and interest (RMB 44.14 million) were paid in advance by Beijing Zhongguancun Sci-tech Financing Guaranty Co., Ltd.
September 2011 - April 2012	11 Hailong CP01	Shandong Hailong	Shandong Hailong was downgraded consecutively	It was possible that the principal and interest were paid with bank bridge loan.