

Note: Key data/information in this sample page is hidden, while in the report it is not.

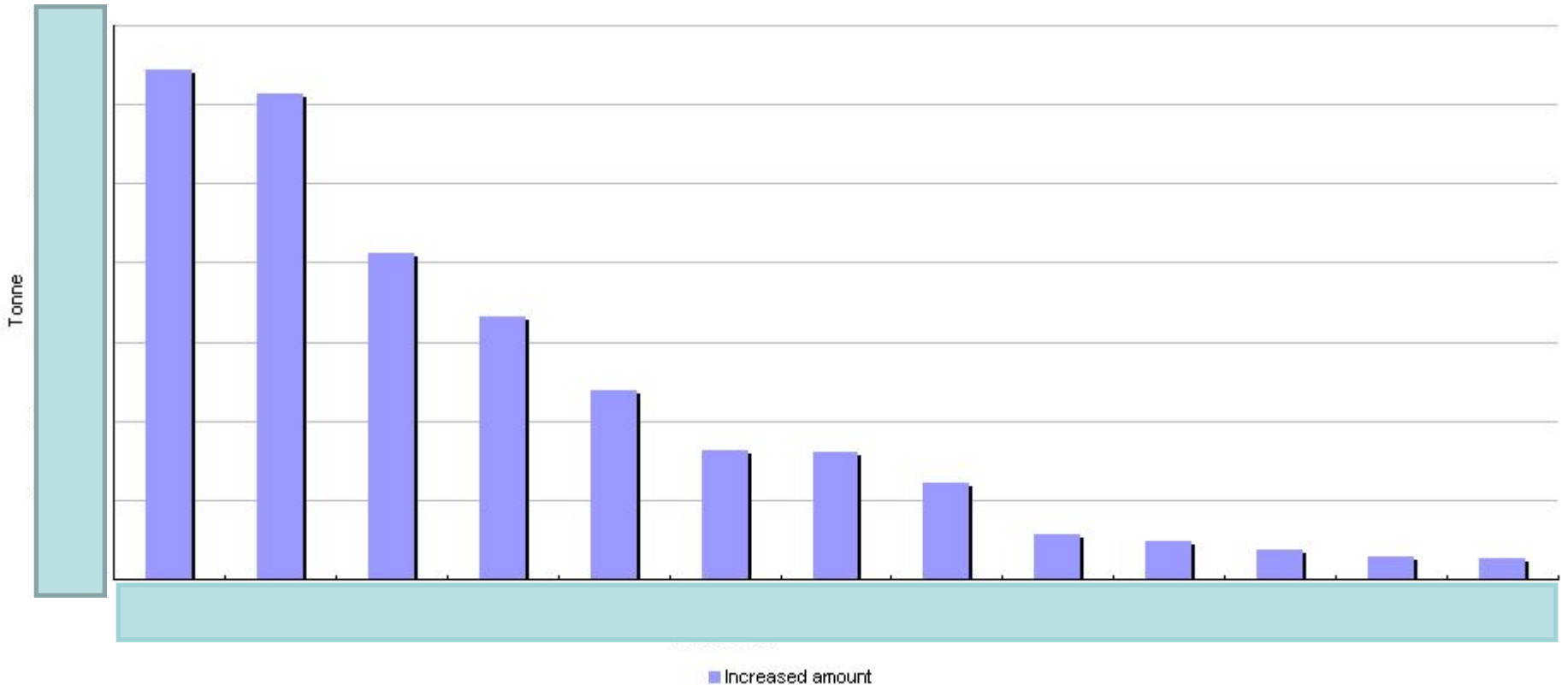
## 2 Opportunities

### 2.1 Emerging market

CCM's researches indicate that:

Among the non-producing countries, XXX, XXX and XXX will enjoy a quick growth in the consumption of titanium dioxide from 2013 to 2017.

Among the producing countries, XXX and XXX are expected to witness a fast growth in the consumption of titanium dioxide form 2013 to 2017.



Source: CCM

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### 2.1.1.2 Close relation between macro economy and titanium dioxide consumption

CCM has calculated the R value from GDPPC, urban population, and industry added value respectively through the regression analysis with the consumption volume of titanium dioxide in the following 5 countries. And it's found that the R value calculated from GDPPC with the consumption of titanium dioxide is the closest to 1. From that, it's deduced that GDPPC has the closest relationship with the consumption of titanium dioxide.

Table 2.1.1.2-1 R value between macro economic index and consumption of titanium dioxide

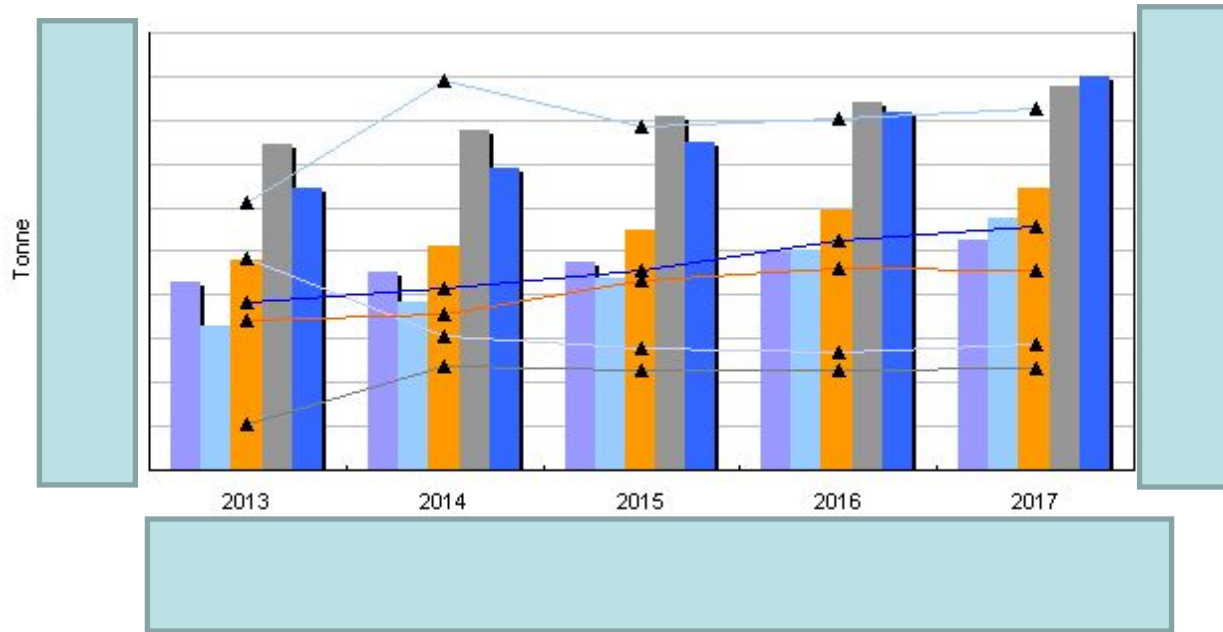
Country	GDPPC	Urban population	Industry value added
Egypt	XXXX	XXXX	XXXX
Viet Nam	XXXX	XXXX	XXXX
Indonesia	0.98	XXXX	0.62
XXXX	0.96	XXXX	XXXX
Russian Federation	XXXX	XXXX	XXXX

*Note: The R value is counted according to the data of GDPPC, urban population and industry added value from 2001 to 2011 (2009 excluded)*

*Source: CCM*

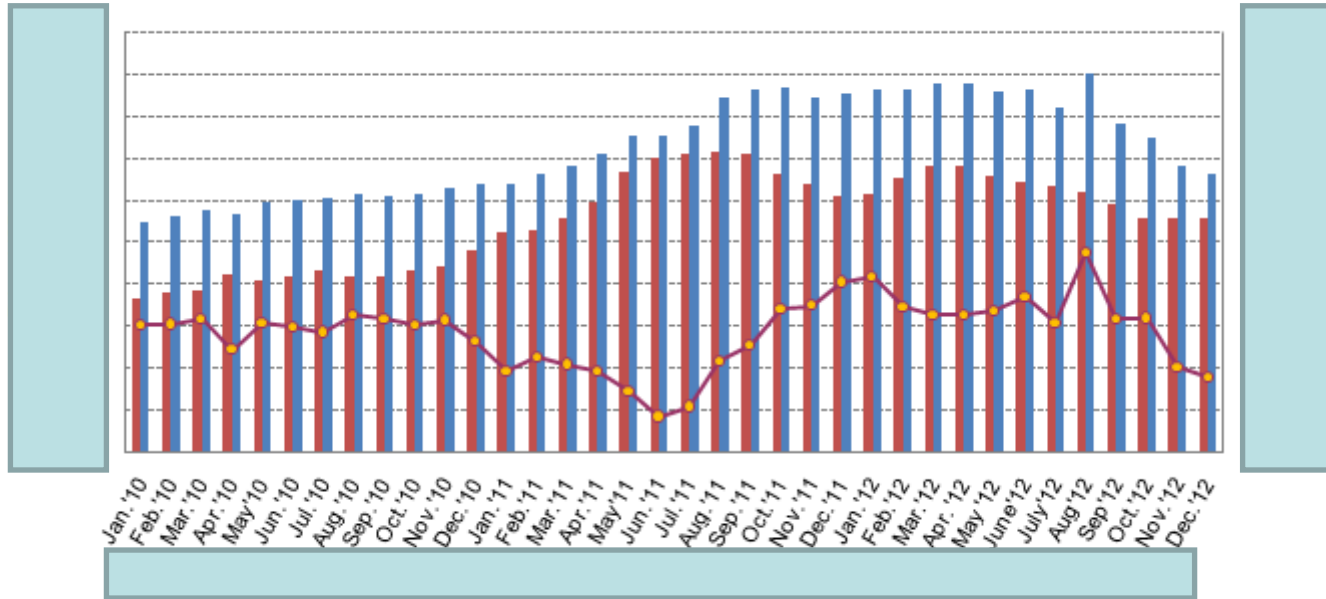
2.1.2.2 Future demand of the main developing countries

Figure 2.1.2.2-1 Forecast on the future demand for titanium dioxide in the main targeted developing countries, 2013-2017



Note: Note: CCM has forecasted the demand in those countries based on historical consumption data and forecasted GDPPC. Political and natural factors are assumed to be stable.  
Source: CCM

Figure 2.2.1.2-2 Price gap between different processes in China, 2010-2012

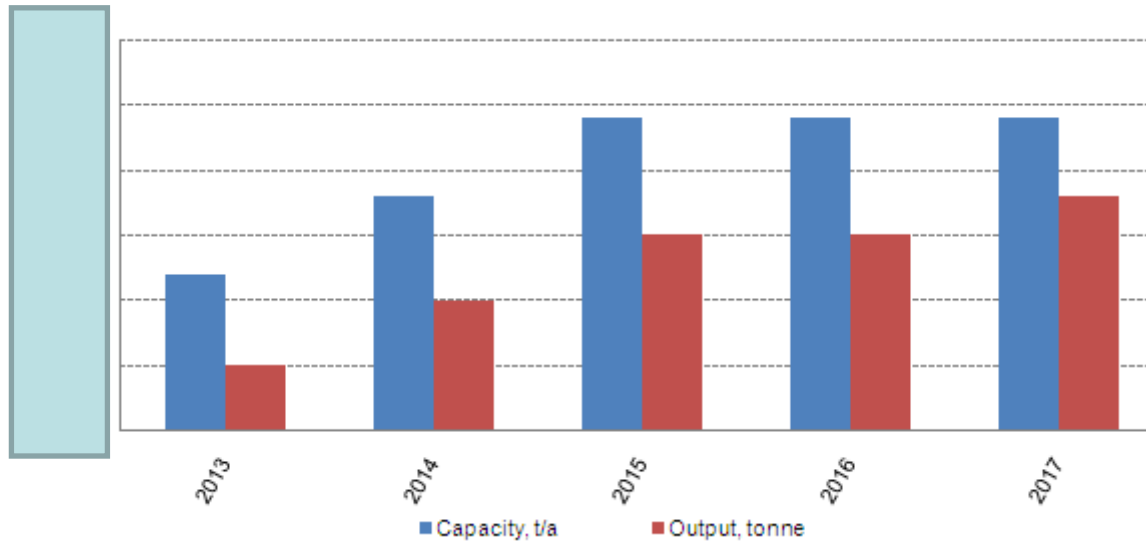


Note: chloride process price include tax  
Source: CCM

2.2.2.2.3 Future trend of chloride process in China

In the future, the domestic capacity of chloride-processed TiO<sub>2</sub> will grow and take more market share in China, with a capacity expected to account for about XX% of China's total capacity of TiO<sub>2</sub> in 2017.

Figure 2.2.2.2.3-1 Estimated output and capacity of chloride-processed TO2 in China, 2013-2017



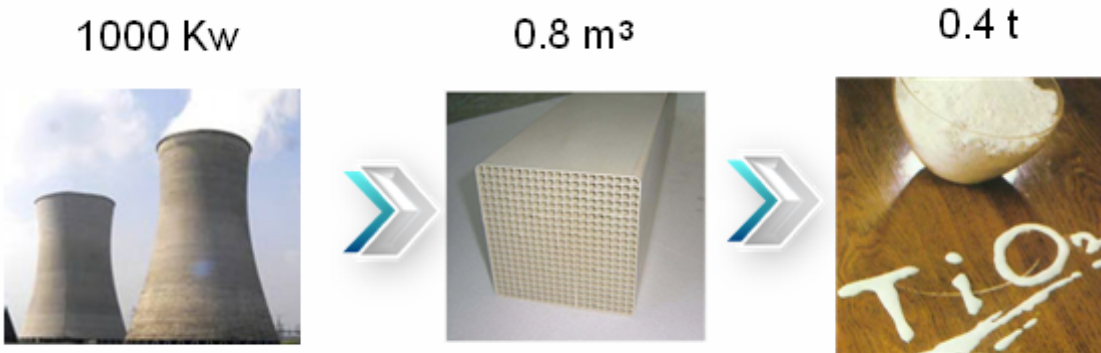
Source: CCM

### 2.3.2 Why is it the opportunity

The economic development decides the development of the TiO<sub>2</sub> industry. At present and in the future, the green economy is and will be the main trend worldwide as green economy represents low pollutant emissions.

In the meantime, China, the largest developing country in the world, is devoted to reduce its pollutant emissions, like nitric oxide (in China's list of pollutants needed to be treated). The SCR (selective catalytic reduction) catalyst is the key to reduce this nitric oxide pollution, and it is mainly constituted by TiO<sub>2</sub> nanometers. In this context, the demand from green economy should promote the development of the TiO<sub>2</sub> industry in China.

Figure 2.3.2-1 Cost process from thermal power to SCR TiO<sub>2</sub>



*Note: SCR catalyst has about 2.28 year's life*  
*Source: CCM*

### 2.3.2.1 Domestic titanium dioxide in SCR is in short supply

The domestic supply of SCR TiO<sub>2</sub> can not meet the domestic demand in China. SCR TiO<sub>2</sub> is a kind of nanometer anatase TiO<sub>2</sub>. It is a kind of highly pure TiO<sub>2</sub> with an excellent surface property.

Table 2.3.2.1-1 Capacity and output of SCR TiO<sub>2</sub> in China in 2012

Company	Capacity, t/a	Output, tonne
Chongqing Xinhua	XXX	XXX
Anhui Precheza	XXX	XXX
Sichuan Huatie	XXX	XXX
Panzhuhua Taidu	XXX	XXX

Source: CCM

Driven by the growing SCR catalyst market in China, China's SCR catalyst capacity grows quickly, which in turn helps boost the demand for SCR TiO<sub>2</sub>.

Table 2.3.2.1-2 Capacity of SCR catalyst in China in 2012

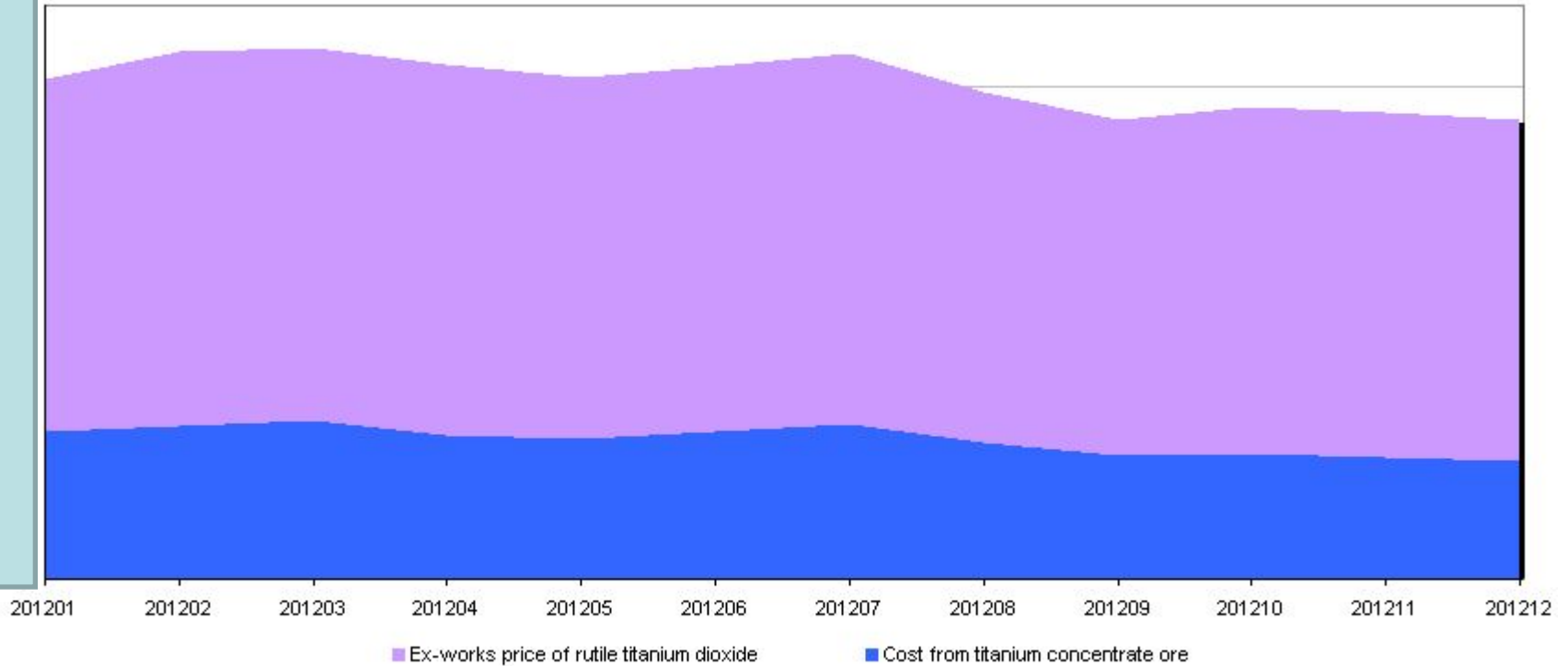
Company	Capacity, m3
Chengdu Dongfang KWH Environmental Protection Catalysts	15,000
Chongqing Yuanda Environmental Protection Catalysts	10,000
Jiangsu Longyuan Catalyst	16,000
Datang Nanjing Environmental Protection	10,000
Zhejiang Tuna	12,000
Zhengzhou Kangning Environmental Protection	15,000
Zhejiang Hailiang Environmental Protection	10,000
Others	80,000

Note: 1 m<sup>3</sup> SCR catalyst consumes about 0.5 tonne of SCR TiO<sub>2</sub>.

Source: CCM



Figure 3.1.1.1-2 Cost from titanium concentrate ore in ex-works price of titanium dioxide in China, Jan. 2012-Dec. 2012



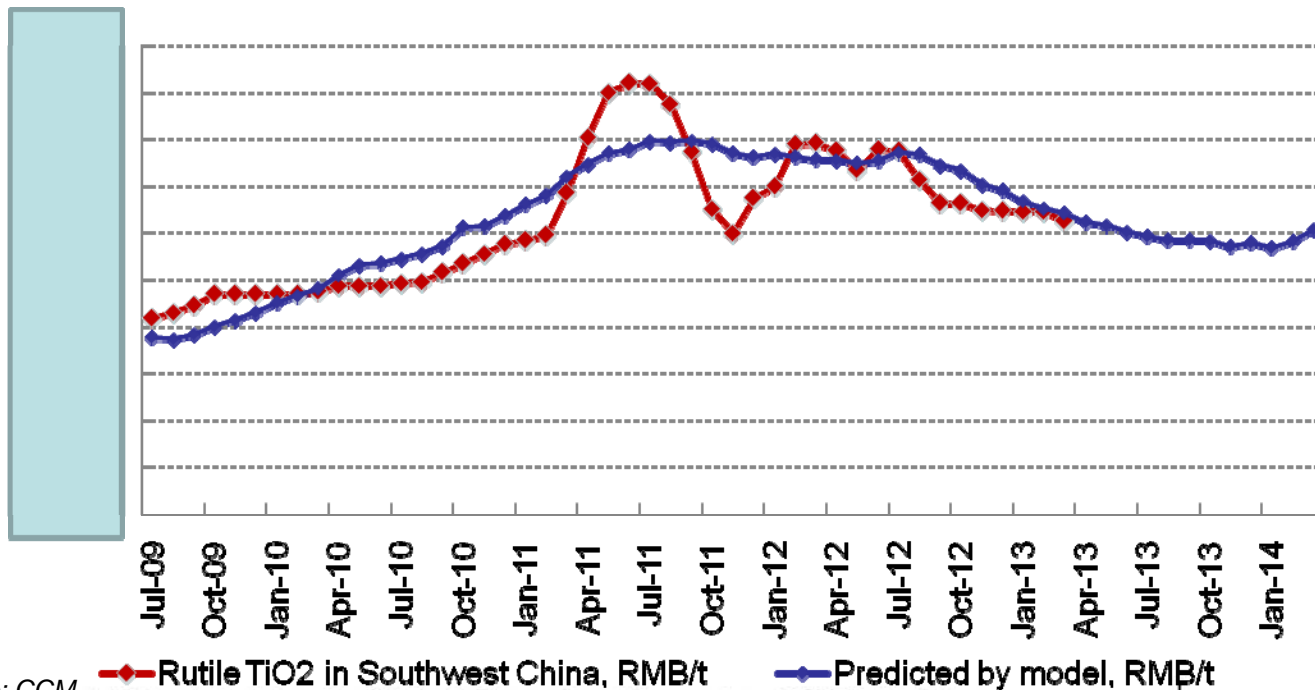
Note: Titanium concentrate ore grade is 40%-46%  
Source: CCM

### 3.3 Price model for TiO2

#### 3.3.1 Price model and forecast

- According to the model, the dip will be around RMBXXX/t(USDXXX/t), during the second half of 2013.
- CCM suggests the manufacturers in China to reduce their ex-factory price slightly despite that some major overseas producers such as Kronos have raised their prices.

Figure 3.3.1-1 Price of rutile TiO2 and price predicted by model, Jul. 2009-Mar. 2014



Source: CCM

◆ Rutile TiO2 in Southwest China, RMB/t      ◆ Predicted by model, RMB/t