An analysis of China's 2011 Coal Resource Tax Reform

Yanmin He
Institute of Economic Research
Kyoto University, Japan.
Email: hym@kier.kyoto-u.ac.jp

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Aims

The main purpose of this study …

In particular, mineral resource taxation levied at the upstream stage (mining and processing of coal) is used to adjust the gaps between private and public costs and deal with externalities and market failure, leading to optimal coal consumption.

This study focuses on the coal resource tax in China as an example of the mineral resource tax system.

China's coal resource tax

– Draft Regulations on Resource Tax(1984):

along with taxes on crude oil /natural gas/metallic/non-metallic
products.

a progressive tax based on profit margin

– Circular on taxing the resource tax on coal according to the
amount on volume method(1986) :

a progressive taxation system → tax based on sales volume
30 state-owned mining companies paid tax, with a specific tax
rate for each coal mine

– Provisional Regulations on Resource Tax(1993)

30 state-owned mining companies → all coal mining companies
specific tax rate → 0.3 and 5 yuan per ton

→ 2011 resource tax reform : revised Provisional Regulations on
Resource Tax (Nov 2011) → the new coal resource tax system was
implemented

Targets of the 2011 resource tax reform：

1. Increase the tax rates on coking coal (0.3~5yuan/ton → 8~20yuan/ton)

⇒　raise the tax revenue by reap the dividends of the windfall profits generated by the boom conditions in the resource .

2. Define the nature of the resource tax system as a taxation policy： a). to control the consumption of mineral resources, and promote energy conservation ,

　b). to increase local fiscal revenues →to enrich local social security and public services, and narrow the fiscal gap between the western regions (resource-rich and relatively backward economy) and the eastern regions.

Table 1: Resource tax rates before and after 2011 reform

	Nov. 2011, before reform	Nov.2011, after reform
Crude oil	8-30 yuan/ton	5% of sales volume
Natural gas	2-15 yuan/1,000 m^3	5% of sales volume
Coal Coke	0.3-5 yuan/ton	8-20 yuan/ton
Other general coal	0.3-5 yuan/ton	0.3-5 yuan/ton (unchanged)
Other non-metallic raw ore	2-30 yuan/ton	0.5–20 yuan/ton or1,000 m^3
Ferrous raw ore	0.4-30 yuan/ton	2–30 yuan/ton
Non-ferrous raw ore	10-60 yuan/ton	0.4–60 yuan/ton
Solid salt	2-10 yuan/ton	10–60 yuan/ton
Brine	8-30 yuan/ton	2–10 yuan/ton

Source: Adapted from the Provisional Regulations on the Resource Tax; the Decision of the State Council on Amending the Provisional Regulation of the People's Republic of China on Resource Tax (No. 605 of the State Council, 2011)

This study analyses the impacts of the coal resource tax on (a) fiscal revenue, (b) resource conservation, and (c) energy saving for the period 1994–2011, prior to the reform.

Based on this analysis, we discuss effects of the 2011 coal resource tax reform,

This study discusses the reasons why the coal tax system cannot change from a volume-based system to an ad valorem system in the same way as crude oil and natural gas.

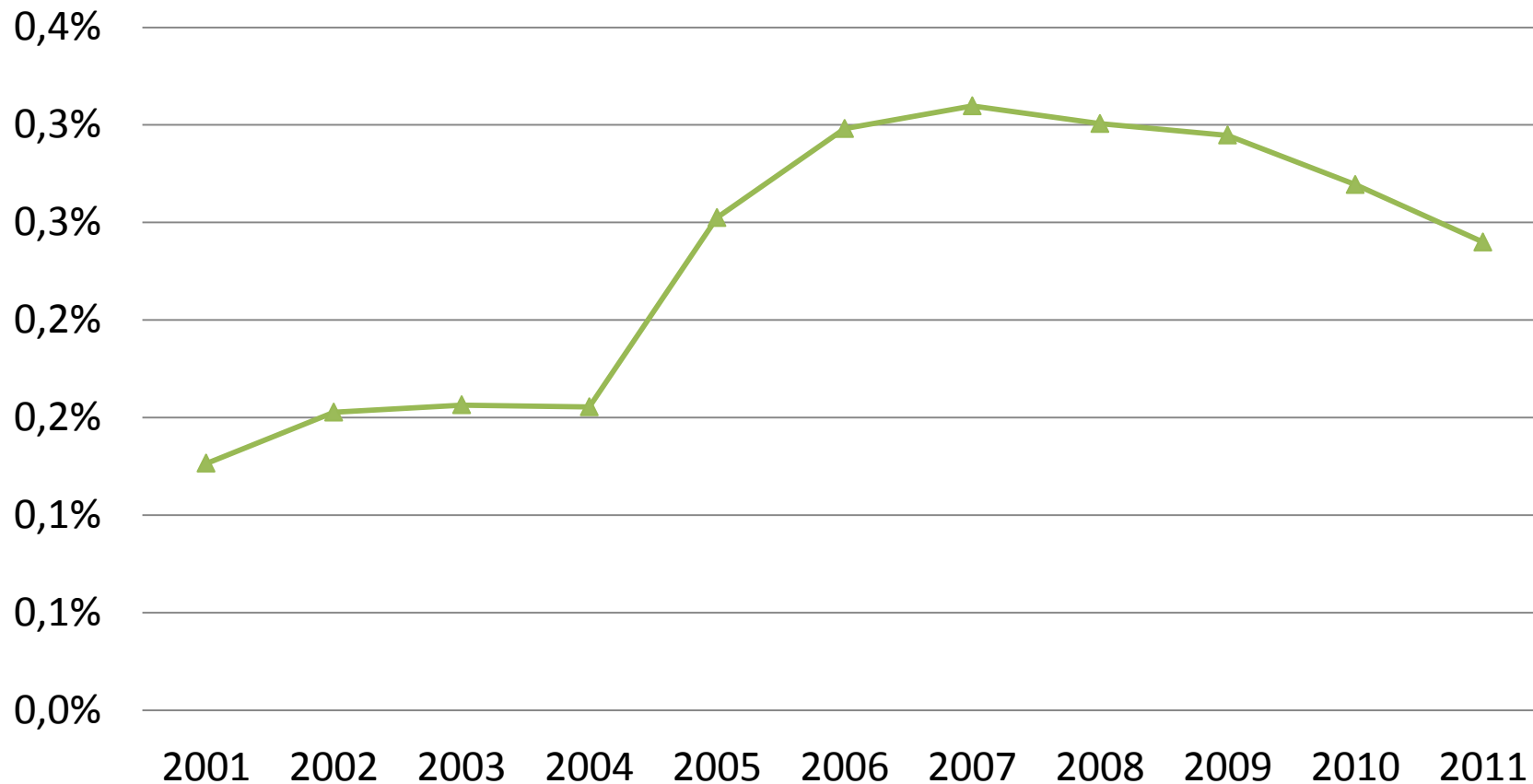# Impacts of the coal resource tax (2001-2011)

Effects on Local Fiscal Revenue

Figure 1 Changes of coal resource tax revenue（2001-2011）
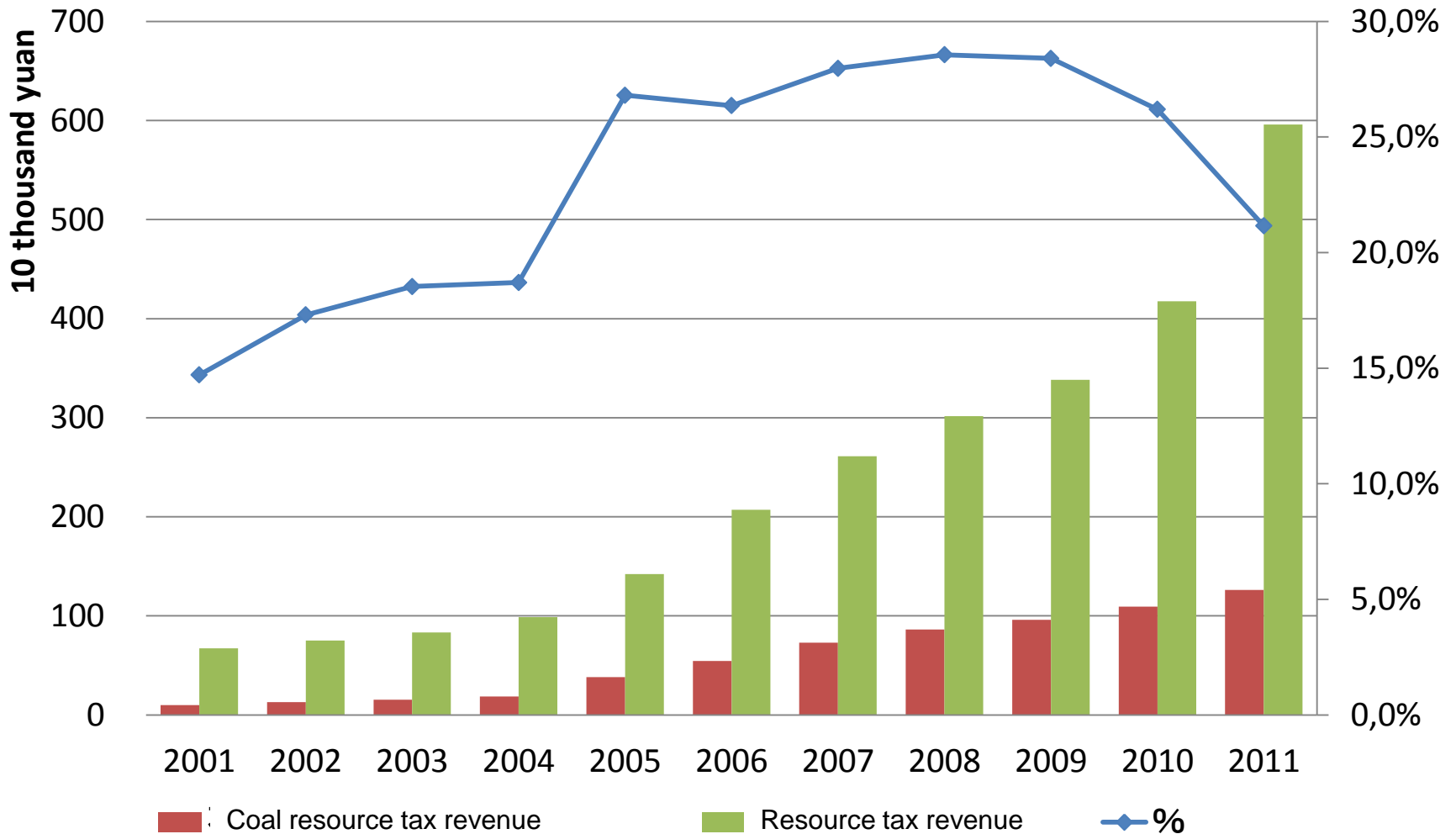
Source: Compiled with data from Tax Year Book of China (2001–2012)

Figure 2 Coal Resource Tax as a share of Local government revenue (2001-2011）

Source: Compiled with data from Tax Year Book of China (2001–2012)

Effects on Coal Resource Conservation

- ## Model①:

$$\ln Y_t = \alpha_1 + \beta_1 TR_t + \beta_2 GDP_t + \beta_3 SI_t + \varepsilon_t$$

Y_t : coal production TR_t : the effective tax rate

SI_t : secondary industry percentage ε_t : the error term

t : year (=2001, 2002…2011).

- ## Result① :

$$\ln Y_t = -17.86 - 0.09 TR_t + 0.78 \ln GDP + 2.95 \ln SI_t$$

$$(-8.15) \quad (-3.01) \quad (7.84) \quad (5.74)$$

$$R^2 = 0.993, \quad \overline{R}^2 = 0.990, \quad DW = 2.74, \quad N = 11.$$

Result①

1. The effective tax rate(=total annual resource tax revenue / total annual production of coal), GDP, and the secondary industry percentage are all have a significant effect on coal production.

2. The effective tax rate has a negative effect.

3. While GDP and the secondary industry percentage have a positive effect.

⇒ *an increase in the effective coal resource tax rate is likely to reduce the volume of coal produced* *(an effect of coal resource conservation)*

Effects on GDP-specific energy consumption

- ## Model ②:

$$\ln EI_t = \alpha_2 + \beta_4 SI_t + \beta_5 TR_t + \upsilon_t$$

EI_t : GDP-specific energy consumption

TR_t : the effective tax rate SI_t : secondary industry percentage

υ_t :the error term t :year (=2001, 2002…2011).

- ## Result ②:

$$\ln EI_t = -2.31 + 0.06 SI_t - 0.15 TR_t$$

$$(-2.90) \quad (3.51) \quad (-14.91)$$

$$R^2 = 0.969, \ \overline{R^2} = 0.962, \ DW = 1.703, \ N = 11.$$

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Result ②

1. The secondary industry percentage and the effective coal resource tax rate are generally significantly associated with the GDP-specific energy consumption.

2. The secondary industry percentage has a positive effect.

3. The effective coal resource tax rate has a negative effect.
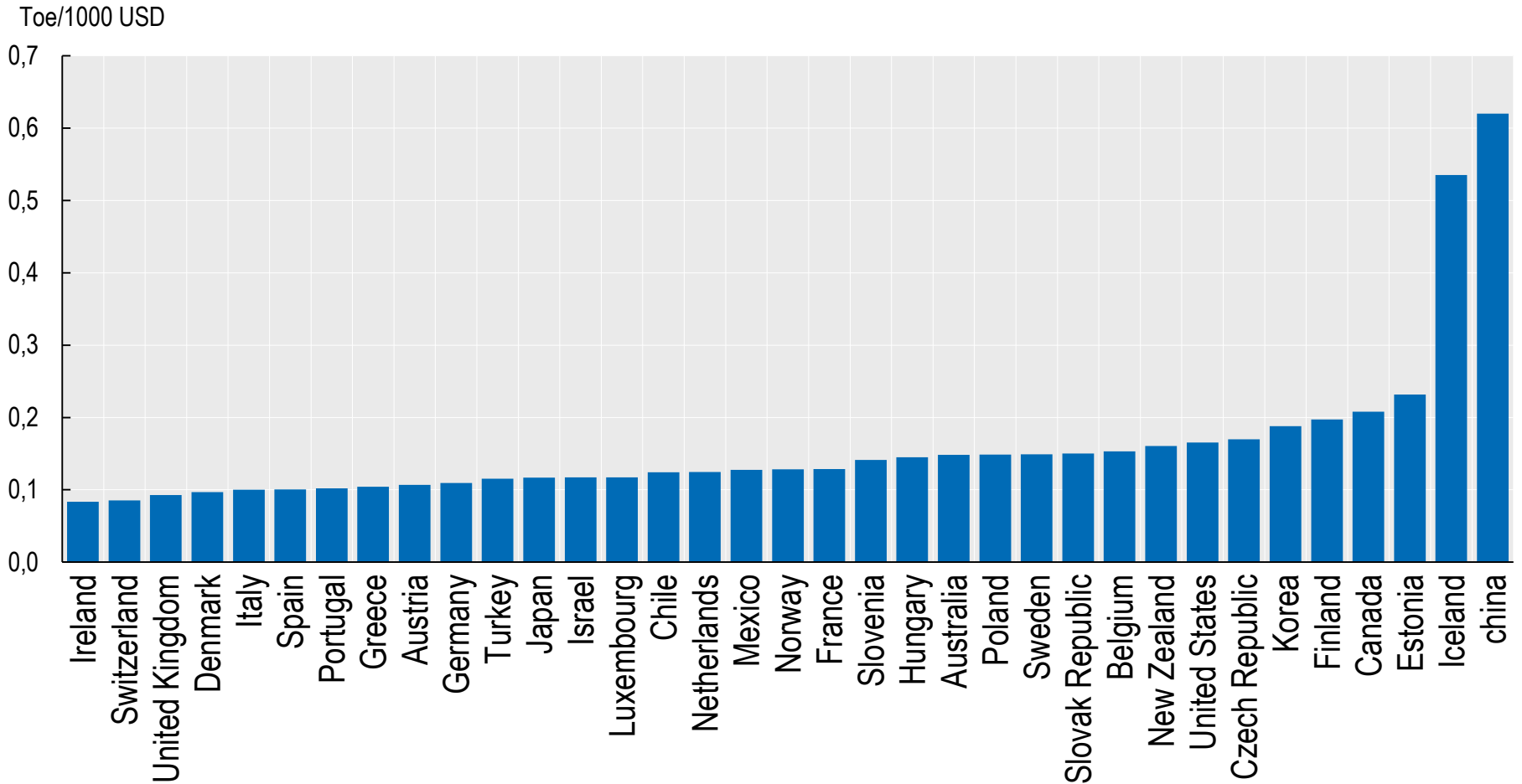
⇒**A higher coal resource tax rate is likely to bring a reduction in energy consumption(an effect on promoting energy saving).**

Figure 3   Coal Production（2000-2013）

Coal Production ◆ effective tax rate
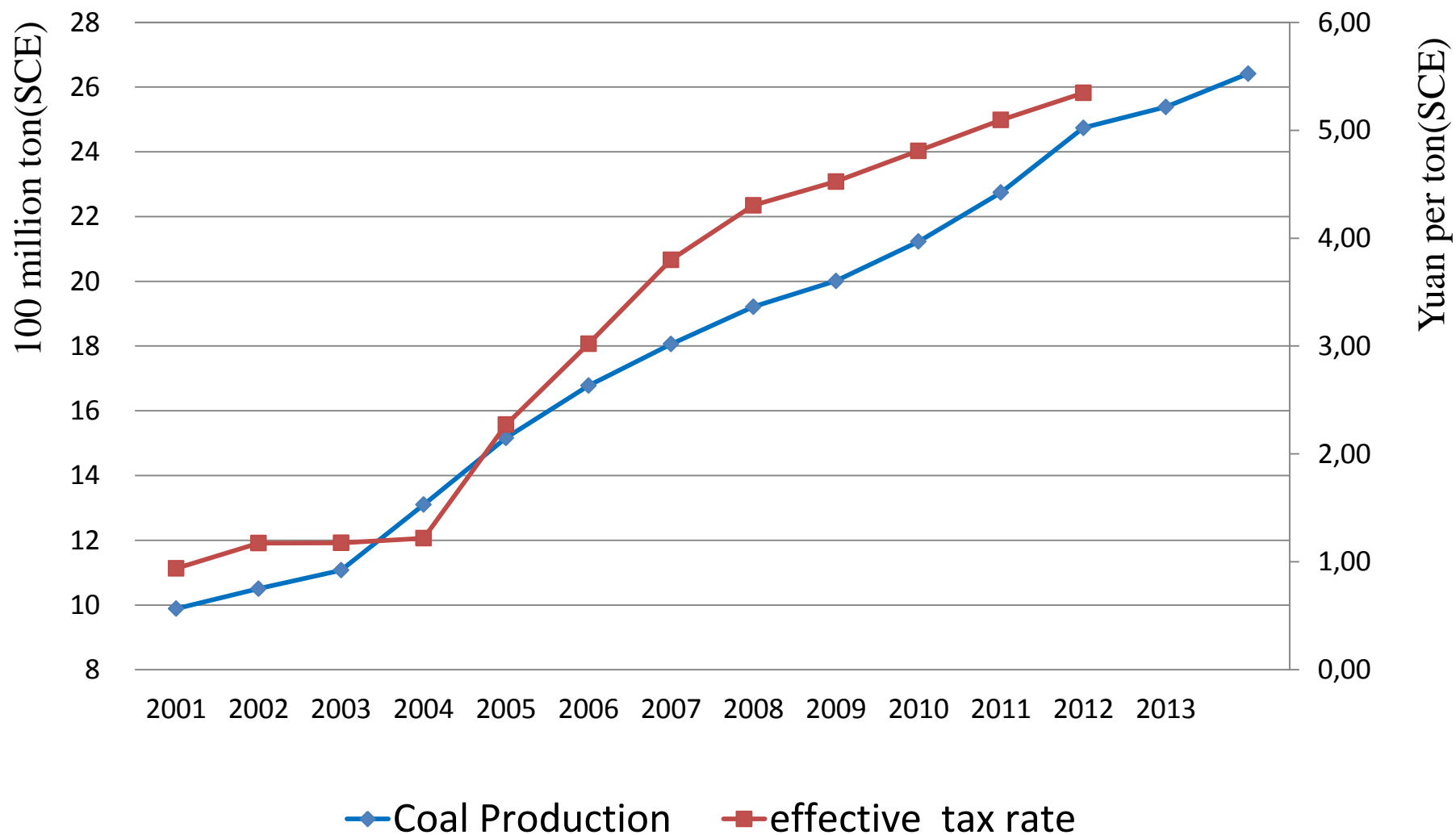
Source: Compiled with data from Chinese Statistical Yearbook (2001–2013)

Figure 4 Energy intensity, 2011

Toe/1000 USD

Source: OECD-IEA (2012), Energy Balances of OECD Countries (database); OECD (2012), OECD Economic Outlook No. 91 (database); OECD ALFS summary tables

Effects of the 2011 coal resource tax reform

Table2   Classified data of resource tax revenue（2010–2012）

100 million yuan

	Total Resource tax revenue	Coal (%)		Crude oil (%)		Natural gas (%)		Others (%)	
2010	417.55	109.38	(26.20)	53.10	(12.72)	10.63	(2.55)	244.44	(58.54)
2011	595.87	126.04	(21.15)	137.37	(23.05)	28.74	(4.82)	303.72	(50.97)
2012	904.37	135.73	(15.01)	309.86	(34.26)	42.22	(4.67)	416.56	(46.06)

⇒coal resource tax revenue increased

⇒ Percentages of coal resource tax ↓⇔ Percentages of crude oil ↑

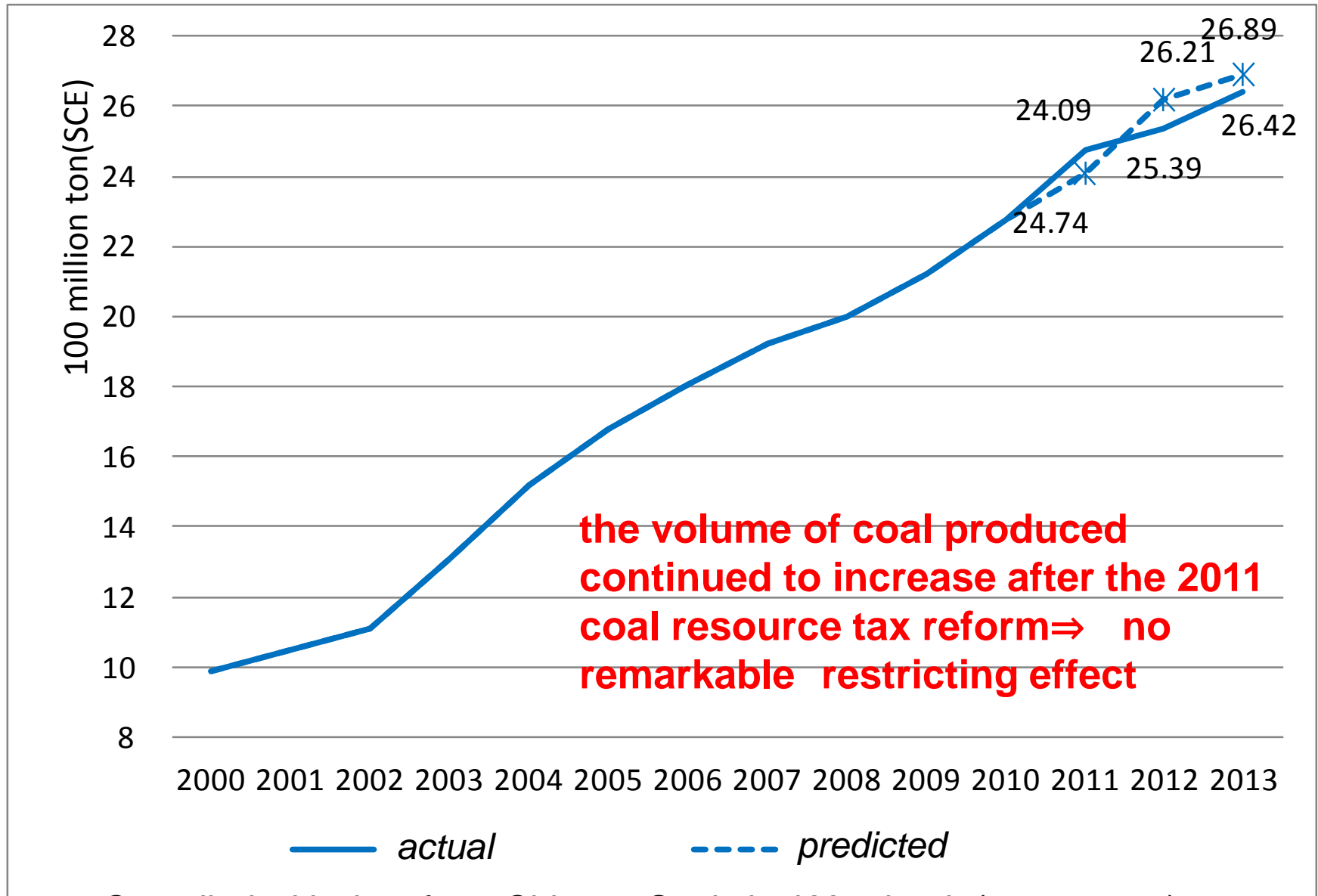# Table3　GDP-specific energy consumption and Coal Production（2010~2012）

Year	GDP-specific energy consumption （SCE ton/10 thousand yuan)		Coal Production （10 thousand ton）
2010	0.81	-10.0%	227,438
2011	0.74	-9.1%	247,394
2012	0.70	-5.2%	253,864
2013	0.66	-5.4%	264,180

Source: Compiled with data from Chinese Statistical Yearbook (2010–2013)

→ Energy intensity↓ (variation range decreased　compared to 2010, 2011)

→ Coal production ↑

Figure5　Coal Production (2001-2013年）

Figure5　Coal Production (2001-2013年）

100 million ton(SCE)

26.89
26.21
24.09
25.39
24.74
26.42

the volume of coal produced continued to increase after the 2011 coal resource tax reform⇒　no remarkable restricting effect

2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013

actual ----- predicted

Source: Compiled with data from Chinese Statistical Yearbook (2001–2013)

The reason is that…

1. Effective tax rate is lower than the statutory tax rate.

   - effective tax rate (raw coal):3.6 yuan/ton (2011)→ 3.8 yuan/ton(2012)< 5 yuan/ton （maximum statutory tax rate）

2. Coal resource tax is not associated with the market price of coal.

$$\ln \Pr{ice}_t = 4.7067 + 0.0021 TR_t$$

$$(92.36) \quad (0.01)$$

$$R^2 = 0.0353 . N = 12$$

The reason why the market price is unrelated to effective tax rate is…

1. Long period of government intervention in coal industry,

2. The distortion of coal price mechanism,

   e.g. monopolistically management by major state-owned companies,

      regional protectionism(*Mei Dian Hu Bao*)

3. The volume-based system taxation system

⇒ *The existing coal resource tax system should be changed to an ad valorem one*

What are the barriers of changing the system from an volume-based tax to an ad valorem one?

1. Each stakeholders in coal production (i.e. the central government and local governments, coal companies, electric power companies, and consumers) had a different perspective, and differences of opinion.

2. The existing *Mei Guan Piao* tax payment system of the production of coal, sales, and management mechanism are based on weight.

Concluding Remarks

➢ The coal resource tax system(1993-2011) in China has...
▪ increased local government revenue,
▪ restricted the coal production (conserving coal resources),
▪ improved energy efficiency.

➢ The 2011 reform to the system...
▪ strengthened the abovementioned (unobvious)
   because the market price is unrelated to effective tax rate.

➢ Changing the coal resource tax system from a volume-based system to an ad valorem system is difficult
▪ conflicts between stakeholders
▪ the existing payment system

Mei Guan Piao tax payment system

Thank you very much for your attention!