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Social Accounting Matrix for China and multisectoral model for environmental issues

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The goal of this work is to provide an overview of the structure of a SAM of China 2011, and then explain one preliminary SAM approach to modelling for environmental issues.



Why Social Accounting Matrix (SAM)?

SAM is a comprehensive, economy-wide database, that presents a “**snapshot picture**” of the economy at hand. The versatility of SAM has made this databases the preference for economic modelling

Main features of SAM

1. A Square matrix the interactions between output by industries and final demand by institutional sectors within an economy (the income of each account, row total must equal the expenditure of each account, column total);
2. SAM shows the interconnection between the distribution of living standards and the structure of production in an economy
3. It is based upon multiple sources, including input-output tables

→ DATA SOURCE:

- World Input-Output Database (WIOD) http://www.wiod.org/new_site/database/niots.htm
- National Accounts of China: National Bureau of Statistics of China;
- Other supplementary data from Chinese sources (State administration of Taxation China, and more);
- Other supplementary data (World Bank, OECD data)

→ **Main phases of DB building:** Data cleaning, error correction, matching between the different data sources, and RECONCILIATION

→ DATA STRUCTURE:

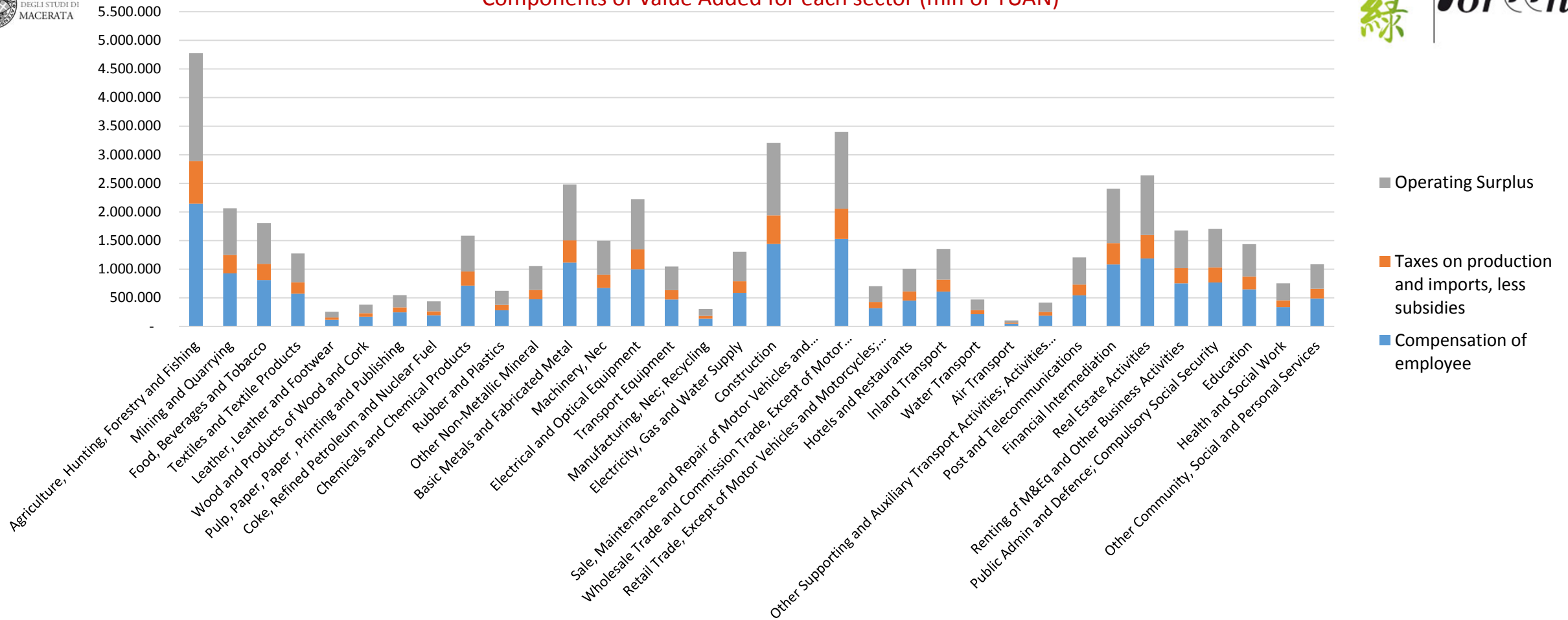
- 35 production sectors (WIOD database, September 2012 release)
- 3 components of Value Added;
- 4 Institutional Sector (Rural household, Urban Household, Government, Business)



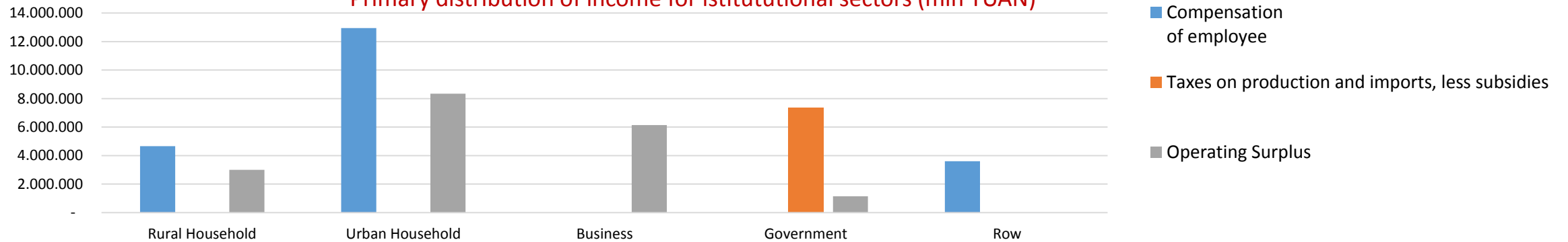
SAM's Structure of China

		COMPONENTS OF VALUE ADDED			INSTITUTIONAL SECTORS				CAPITAL ACCOUNTS	ROW	Total	
		INDUSTRIES	Compensation of employee	Taxes on production	Operating Surplus	Rural Household	Urban Household	Business	Government			
INDUSTRIES	Intermediate consumption					Final Consumption	Final Consumption	Final Consumption	Final Consumption	Investments	Exports	T1
COMPONENTS OF VALUE ADDED	Compensation of employee	Value Added Generation									Primary Income distribution	T2
	Taxes on production	Value Added Generation										T3
	Operating Surplus	Value Added Generation										T4
INSTITUTIONAL SECTORS	Rural Household		Primary Income distribution		Primary Income distribution	Secondary Income Distribution	Secondary Income Distribution	Secondary Income Distribution	Secondary Income Distribution		Secondary Income Distribution	T5
	Urban Household		Primary Income distribution		Primary Income distribution	Secondary Income Distribution	Secondary Income Distribution	Secondary Income Distribution	Secondary Income Distribution		Secondary Income Distribution	T6
	Business				Primary Income distribution	Secondary Income Distribution	Secondary Income Distribution	Secondary Income Distribution	Secondary Income Distribution		Secondary Income Distribution	T7
	Government			Primary Income distribution	Primary Income distribution	Secondary Income Distribution	Secondary Income Distribution	Secondary Income Distribution	Secondary Income Distribution		Secondary Income Distribution	T8
CAPITAL ACCOUNTS					Savings	Savings	Savings	Savings			T9	
ROW	Imports	Primary Income distribution			Secondary Income Distribution	Secondary Income Distribution	Secondary Income Distribution	Secondary Income Distribution		Secondary Income Distribution	T10	
Total		T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	

Components of Value Added for each sector (mln of YUAN)



Primary distribution of income for istitutational sectors (mln YUAN)



Study how the productive structure and the income distribution in the Chinese economy have had an impact over CO2 emissions in 2011.

What is the analytical framework?

The methodology proposed for modelling is an evolution on Miyazawa approach (1970). According to data, the model was integrated basing on the Social Accounting Matrix (SAM) approach.

→ In Miyazawa model there is the connection between production and income distribution making the final demand endogenous.

Assumptions

- Fixed prices;
- Fixed technical coefficients.

In this model, one shock on institutional sector's primary income produces, through the formation of final demand for each industry, an effect on total output

$$X = Z + C + I + G + (EXP - IMP)$$

$$x = Ax + F^{en} + F^{es}$$

$$x = Ax + CPV(x) + F^{es}$$

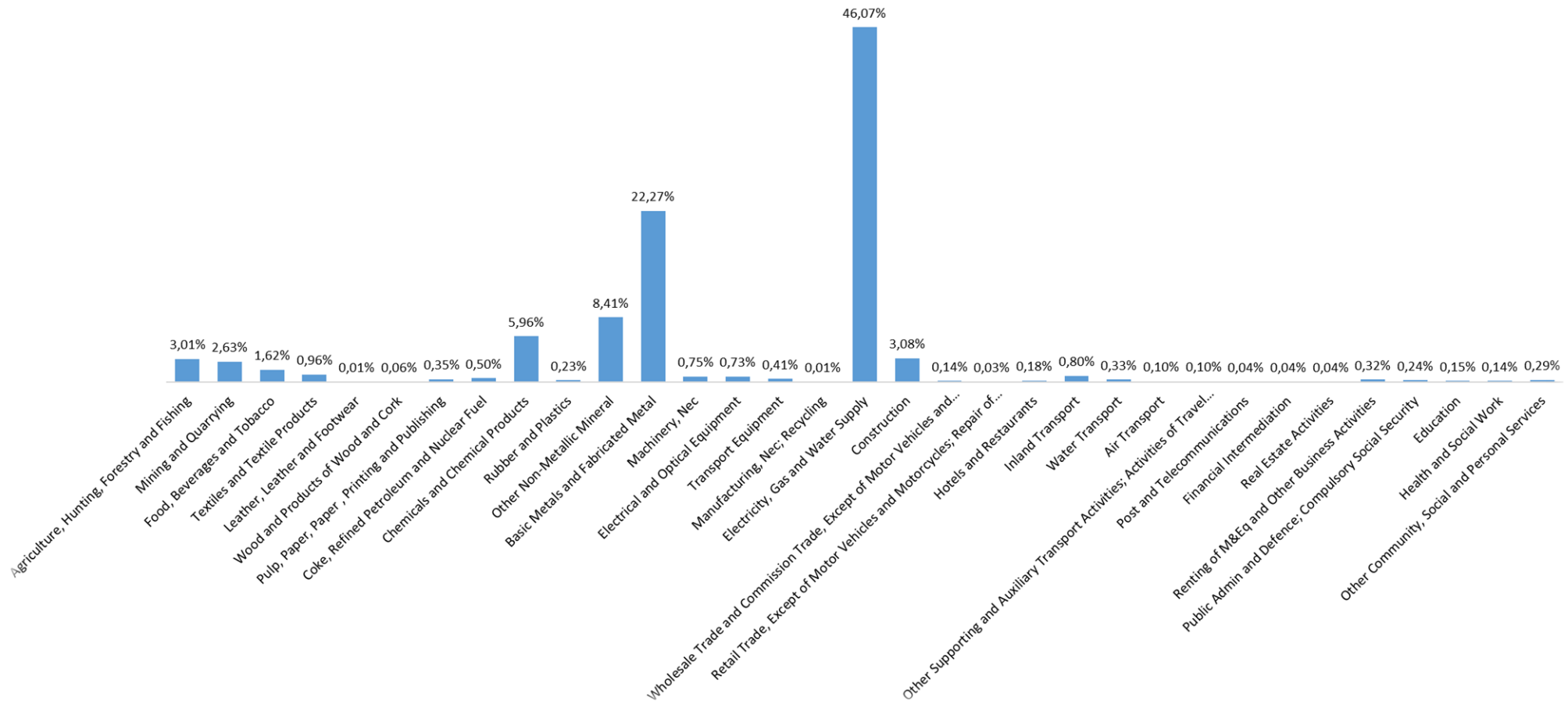
$$x = (I - A - CPV)^{-1} * F^{es}$$

$$X^E = E * X$$

$$i = E(I - A - CPV)^{-1} * F^{es}$$

Results and Conclusion

■ % Pollution for each industry provoked by the level of total output



Different shocks of F^{es} could provoke different quantitative level of CO2 emissions in China.



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Thank you for your attention!

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