Computable General Equilibrium Model

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Introduction

- CGE model is the general equilibrium model including supply and demand relationship
- Application: Taxation Reform and Influence(i.e. the impacts of taxation and price changes on outputs across sectors), Education Expenditure and human resource, energy and natural resource, sustainable development...
- Type(According to factors market structure): Macro-closure of 1) the neoclassical element market(the most popular); 2) Keynes; 3)Leuis ;
- Data Base: Social Accounting Matrix

Introduction

Social Accounting Matrix

- The SAM table describes the supply and usage flows of the individual accounts in the System of National Accounts and their balance relationship in matrix form
- Include the productive and non-productive accounts in the national economy, as well as the closed relationship between them
- Balance SAM Table: Least Square, RAS, Direct cross-entropy method

	收入	支出					汇总
		1	2	3	4	5	
1	活动/商品		C	G	I	E	需求
2	居民	Y					居民收入
3	政府	Ti	Td				政府收入
4	资本帐户		Sh	Sg		Sf	储蓄
5	世界其他地区	M					进口
	汇总	供给	居民支出	政府支出	投资	外汇收入	

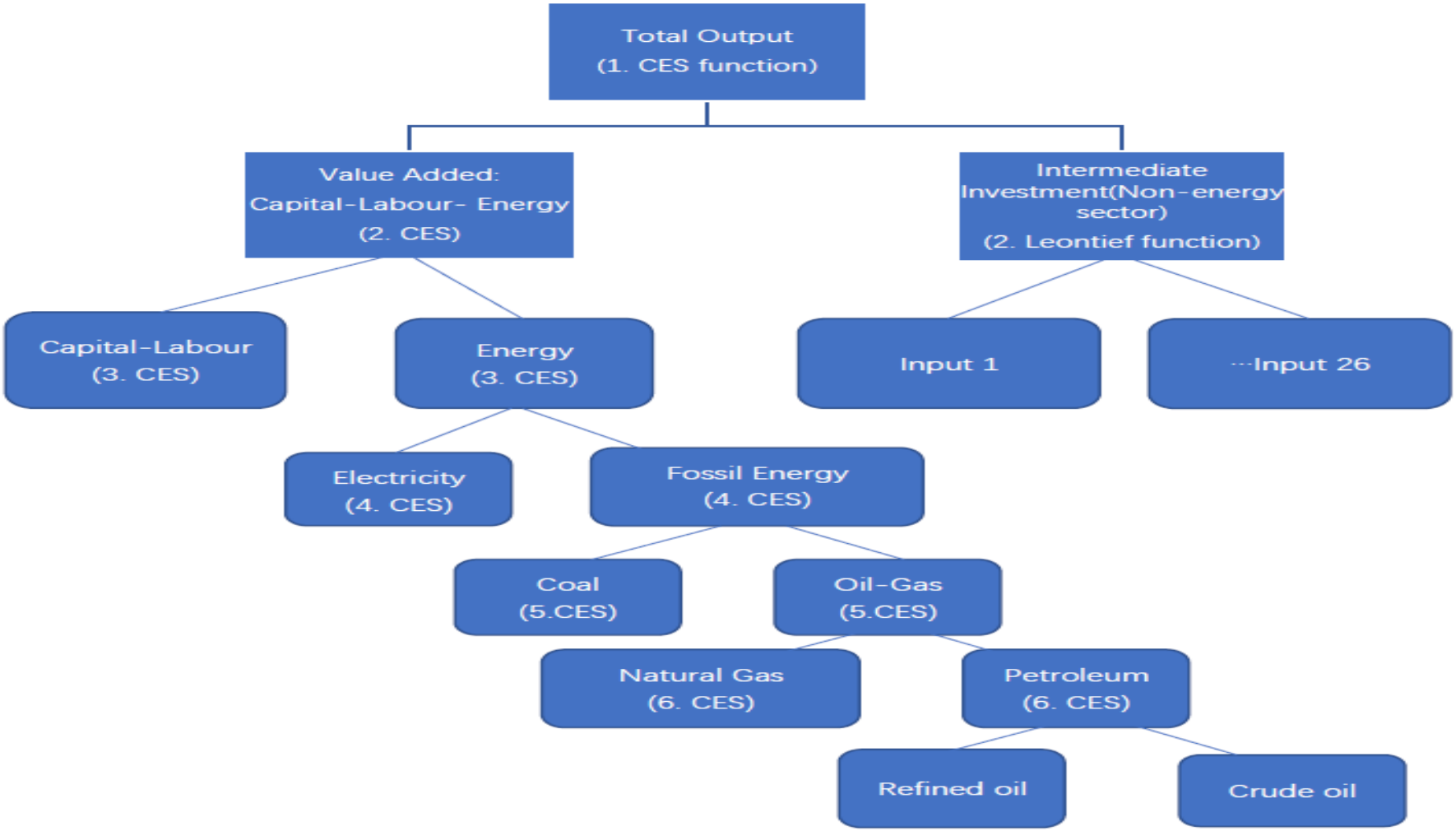
Standard CGE Model-With Carbon Taxation

Dynamic CGE Model(Six Modules)

- Production Module
- Domestic Economic Entities Module
- Trade Module
- Energy and Carbon Emission Module
- Dynamic Mechanism Module
- Macro-colsure Module

Standard CGE Model-With Carbon Taxation

Production Module Design



Standard CGE Model-With Carbon Taxation

Domestic Economic Entities Module

- Consist of Household, Enterprise, Government
- Three Assumptions:
  1) Household Utility: Cobb-Douglas Function;
  2) Government Income: non-taxation income, taxation income, and foreign transfer payment;
  3) Total investment and government expenditure are exogenous.
- The impacts of carbon taxation on household's welfare level could be measured by Hich's equivalent variation.

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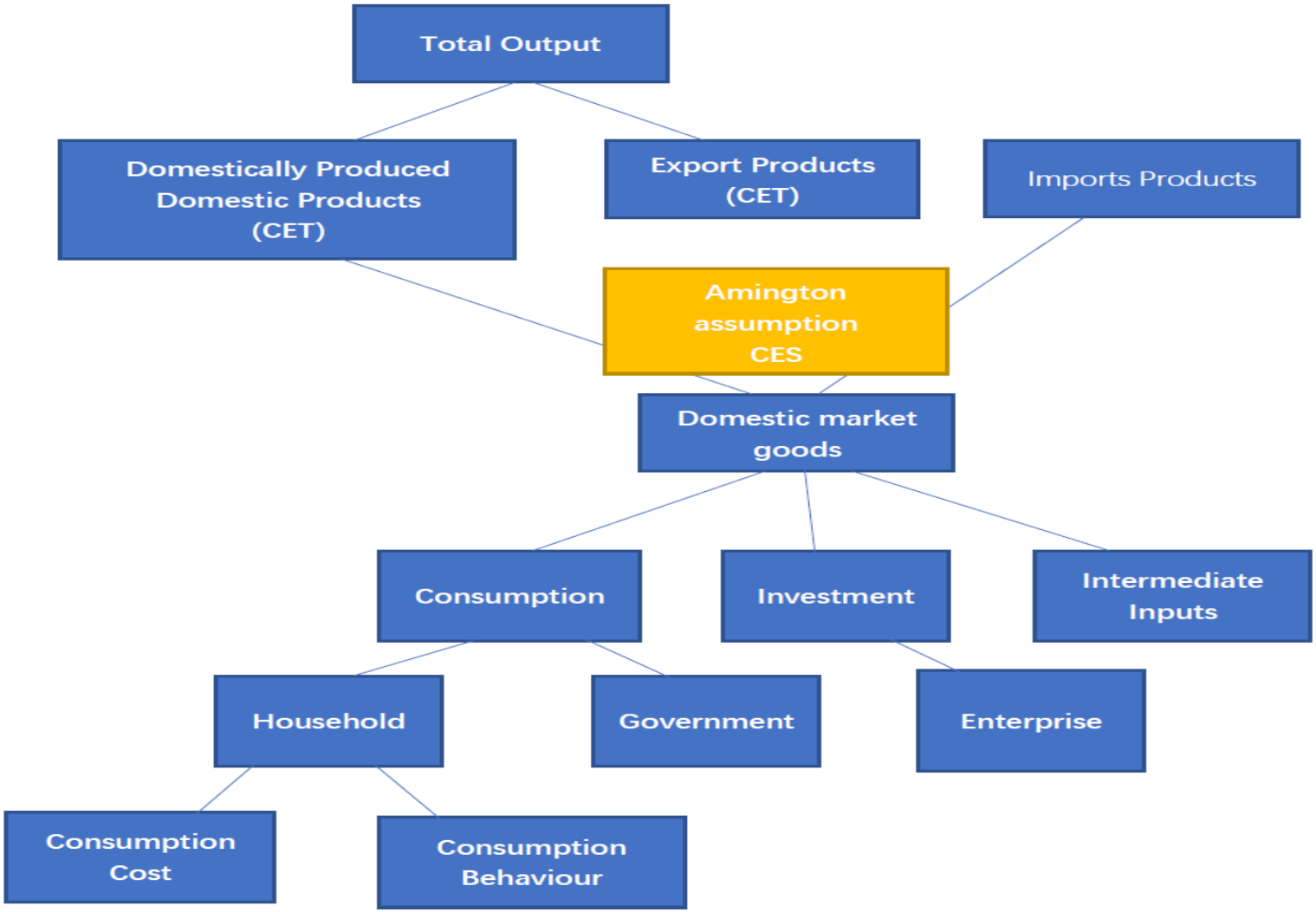
Trade Module Design



Standard CGE Model-With Carbon Taxation

Energy and Carbon Emission Module

- Connect energy and carbon emission with economic system;
- Carbon emission in energy production: enterprise;
- Carbon emission in energy consumption: household, enterprise and government.

Dynamic Mechanism Module

Capital factors accumulation, increased labour supply, and technology development are considered in the dynamic mechanism, and recursive form is implemented to realize dynamics.

Macro-closure Module

- Markets Balance;
- Neoclassical macro-closure:
  1) Endogenous: the prices of capital, labour and commodities
  2) Exogenous: the number of capital and labour
  3) Full employment in the labour market
- Exchange rate is fixed.

Design CGE Model

- Before designing CGE model, consider the research issues and economic environment as a whole;
- Design mathematical theoretical models and macro-closure features based on economic theory;
- As required by the GAMS program, modify equations and restrictions to the extent permitted by economic theory;
- Verify the reliability of model results;
- Test the robustness and parameter sensitivity of the model;
- Evaluate policies.

Research Plan

Task	2022						
	2	3	4	5	6	7	8
1. Literature Review	*	*					
2. Make and Balance SAM Table	*	*	*	*			
3. Build Mathematical Model		*	*	*	*		
4. Set Carbon Taxation Scenario				*	*		
5. GAMS programming			*	*	*	*	
6. Write report and evaluate policy							*

Ending

Thank you for your attention