Environmental Economics Lunch Seminar
September 26, 2013

Carbon Taxation and Social Progress

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CIRED

A gap between theory and practice

Large theoretical consensus among economists

Carbon tax = the **most efficient instrument** for reducing CO_2 emissions

VS

A frequent blocking of the implementation

- Higher energy prices will **harm activity, competitiveness and employment**
- It will **affect the most vulnerable** (households and industries)
- And it will risk to **jeopardize other objectives** (debt reduction...)

Key lessons from economic literature

- No exemption for environmental efficiency
- A key question: how to use the carbon tax revenue ?
- The most efficient recycling option: lower social contributions
- The net impacts on activity and employment are uncertain
- The equity objective may justify other recycling options
- Very few links with other long term policies (pensions, debt)

Outline: Questions and Analyses

1. Net macroeconomic impact. Lessons from a stylized model

2. Consistency with future goals. Lessons from a CGE model (2020)

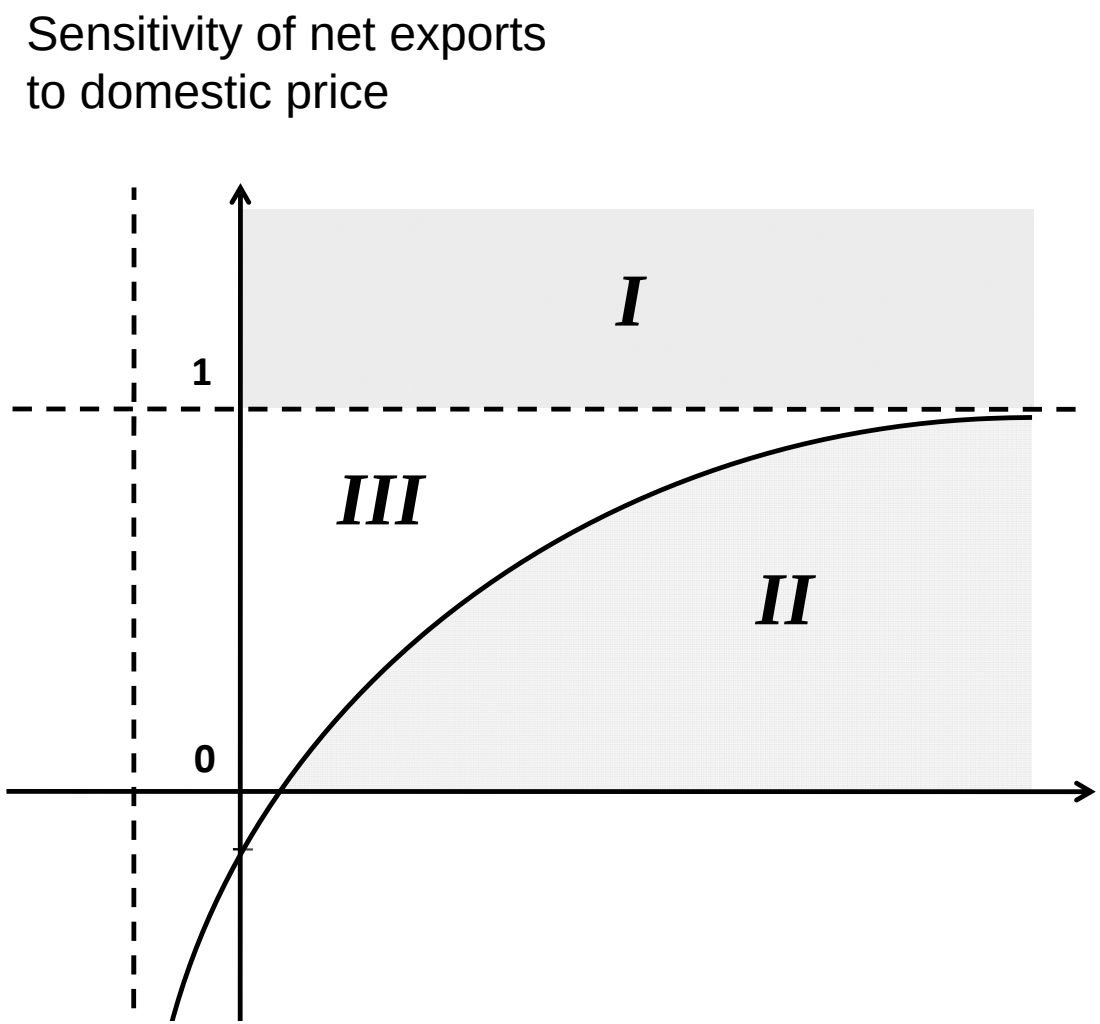
3. Equity-efficiency dilemma. Lessons from a CGE model (2004)

A simplified model of second best economy

- All the energy consumed is imported
- One domestic product, in competition with foreign products
- Two factors of production : energy and labour
- Fix technical coefficients + households' energy consumption
- Existing tax on energy (quantity) and on labour (*ad valorem*)
- Nominal net wage adjusts to unemployment
- Net exports adjust to domestic production cost/price

Conditions for a net employment gain

The net impact depends on 2 controversial parameters



I et ***II*** : Gains

III : Losses

Conditions for a net employment gain

Domaines	Unemployment	Production	Wages	Price	Consumption	Exports
I	-	+	+	-	+	+
II	-	+	+	+	+	-
III	+	-	-	-	-	+

I : The positive impact on real trade dominates

II : The positive impact on wage growth dominates

III : The negative impact on energy bills dominates

The state of the economy

Domain III (activity and employment losses) is narrow when:

1. Unemployment is initially high

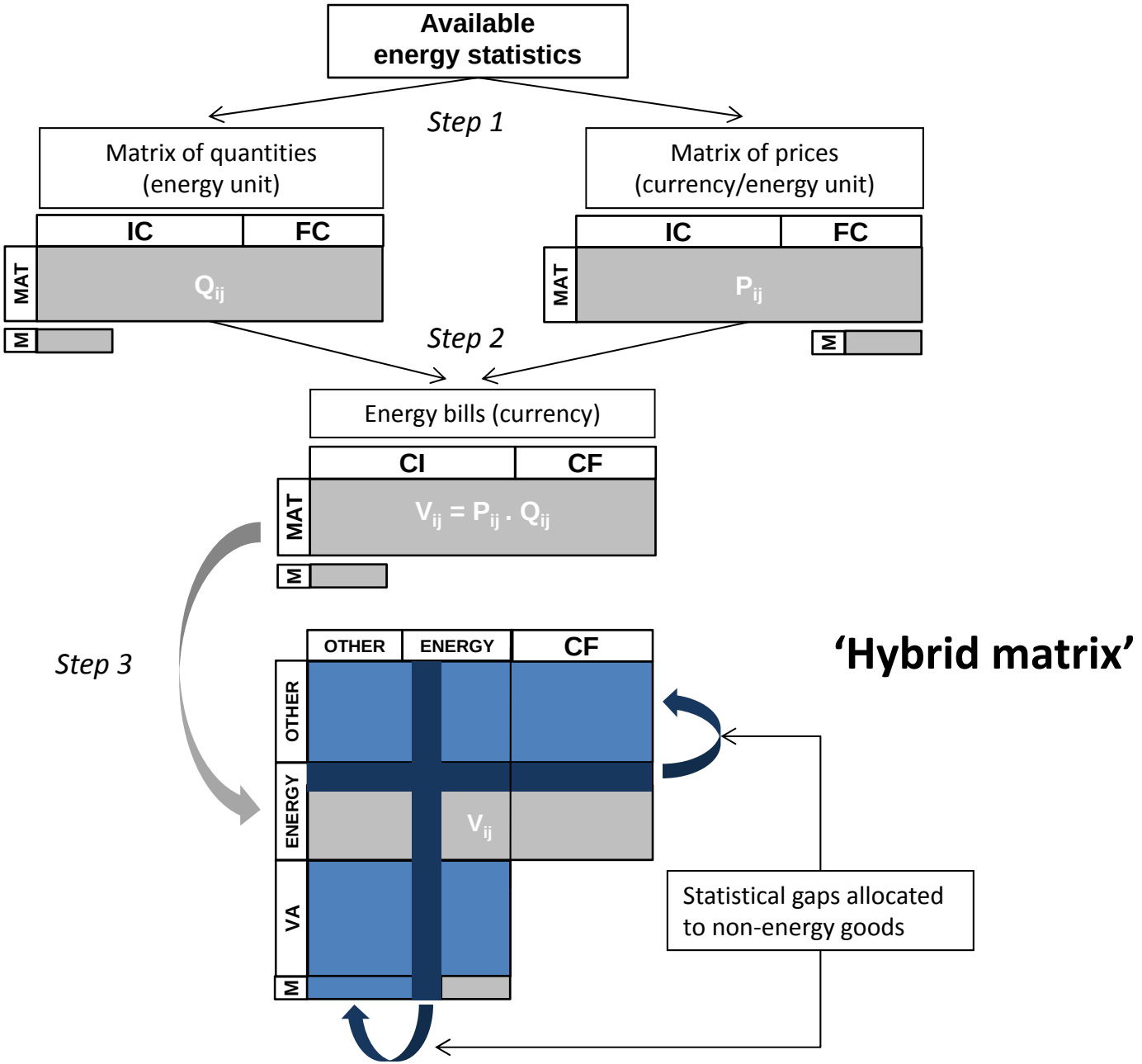
2. Net nominal wage is initially low

3. Energy consumption by households is initially high
   and higher than the energy consumption by productive systems

To deepen the analysis

1. Empirical information on the initial state
2. Empirical information on the future context
3. Energy-saving potentials & structural change possibilities
4. Behaviour of public administrations (other reforms, targets)
5. Heterogeneity of agents & redistribution

The hybridization of economic and energy data



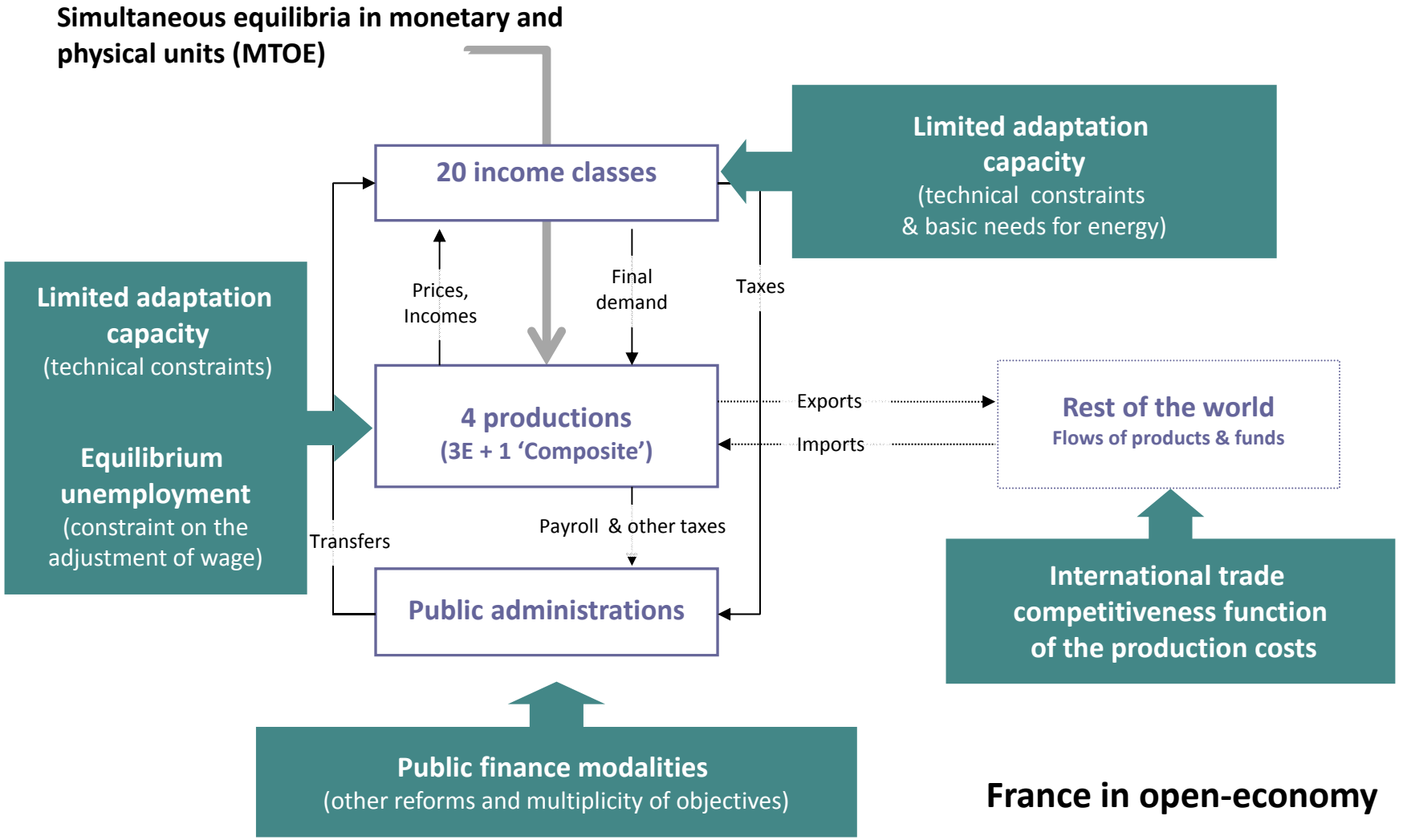
Assumptions about future constraints (2020)

1. Higher competition on resources and markets
   - IMACLIM-R: a barrel of oil at 60€ (optimist, 77€ in 2011)
   - IMACLIM-R: lower wages /production costs in emerging economies

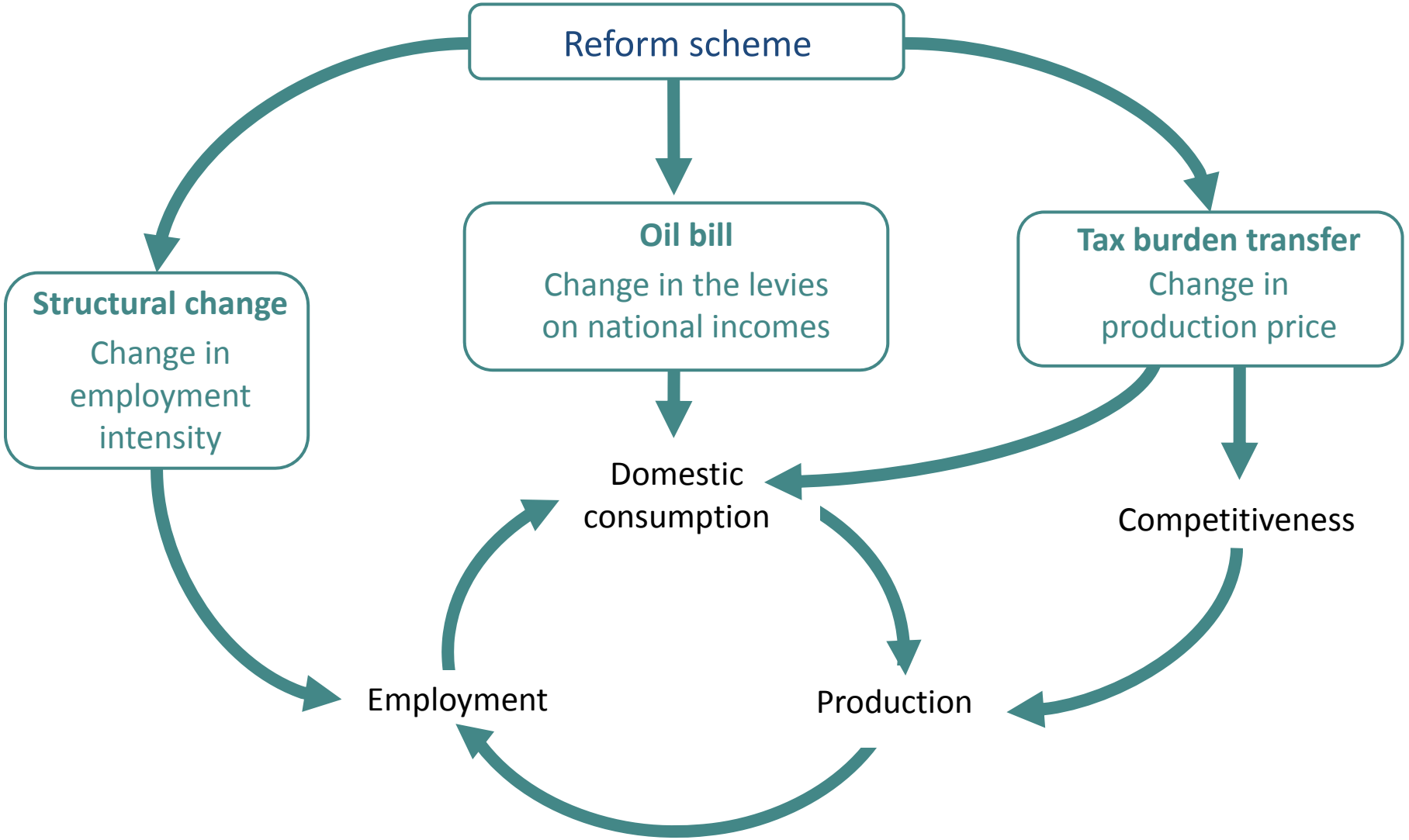
2. Consequences of the demographic transition
   - COR: funding needs for pensions 41-48 billions (11 en 2008)
   - CEPII: important decrease in the households' saving rate

3. Growth and employment potentials after the crisis
   - COR: productivity and unemployment from the DGT

The simulation platform IMACLIM-S.2.4



Interaction of three mechanisms



Reconnecting climate, pensions and deficits issues

Consider: 1) A 2020 France 'COR compatible'

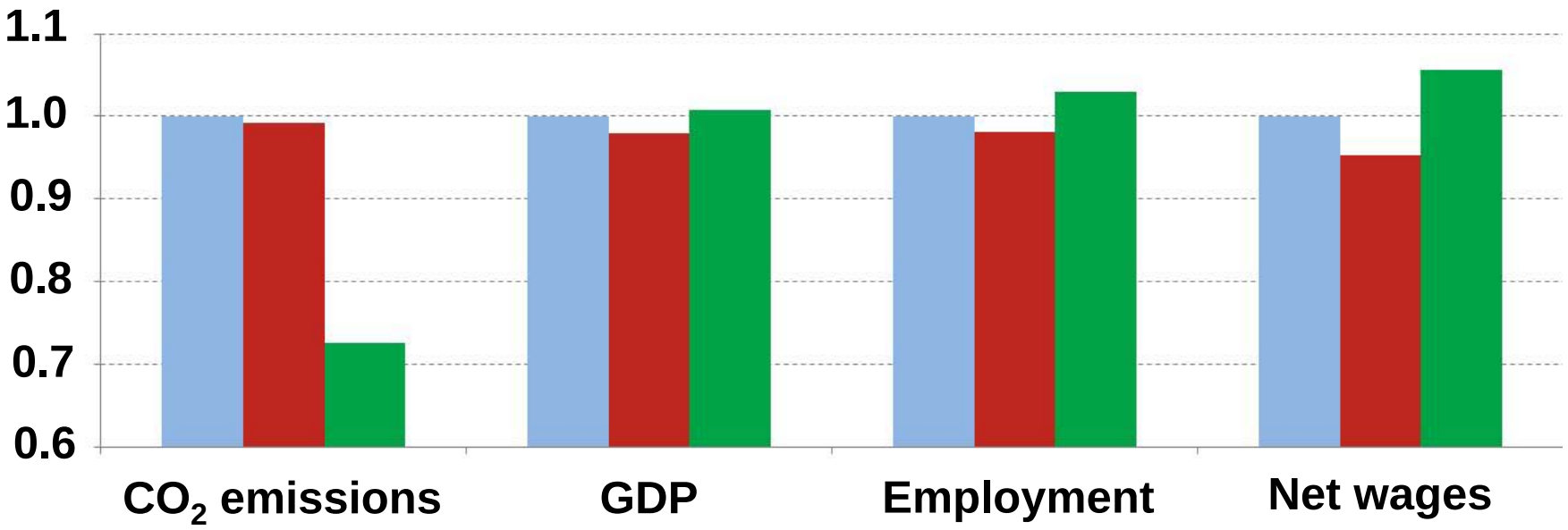
2) an objective: funding pensions over 2004-2020

Three structural reforms

Higher legal retirement age (>3 yrs)

Higher social contributions (+7 pts)

€200/tCO_2 - Lower SSC & Higher Income Tax (+2 pts)



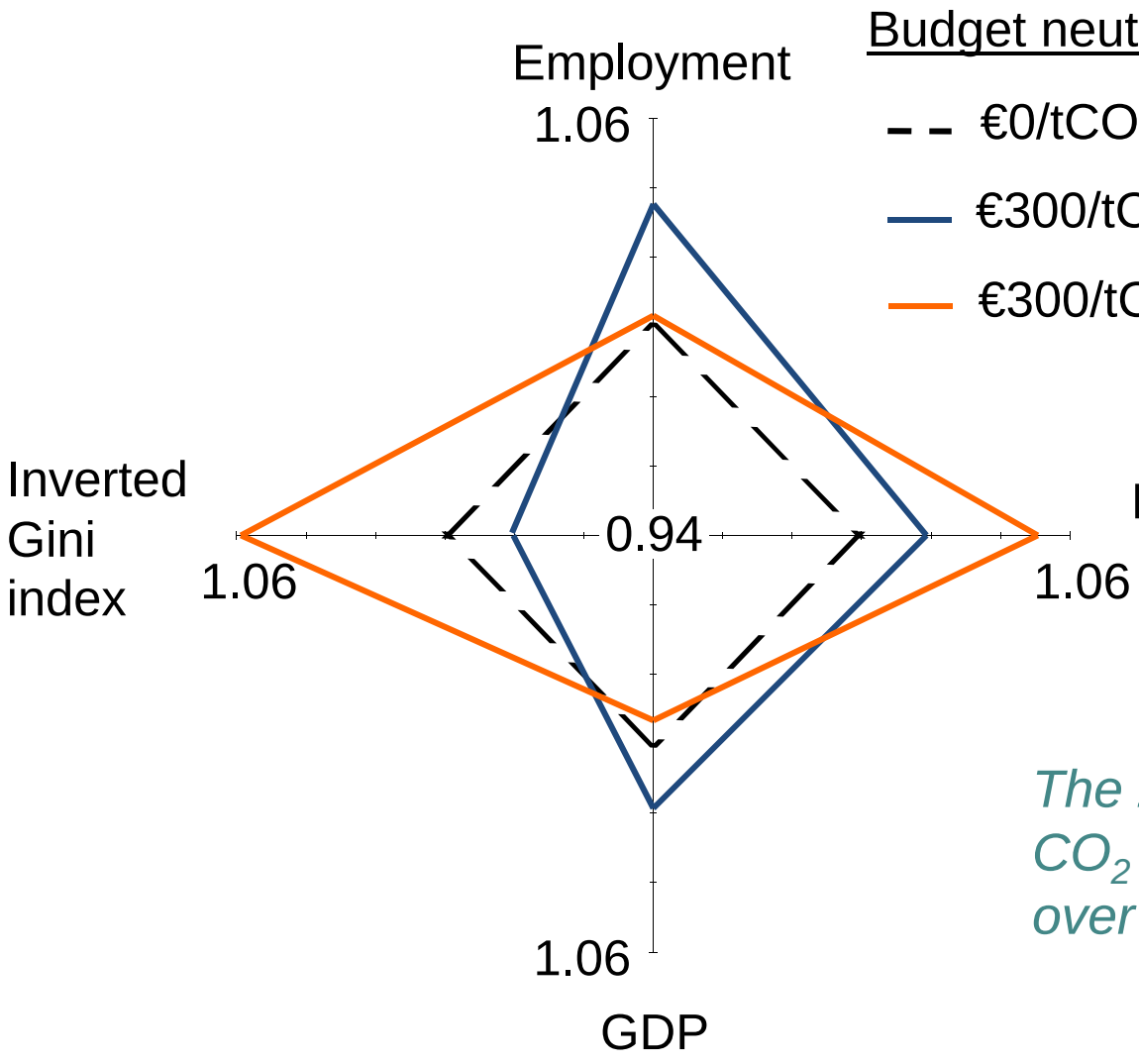
The mechanism of a potential virtuous cycle

Reform schemes	Higher social contributions (CS)	200€/tC02 - Lower CS + Higher Income Tax (2pts)
Oil bill to GDP ratio	-1,1%	-17,5%
Labour intensity	-0,3%	+0,9%
Production price	+2,3%	+0,5%
Net nominal wage	-4,7%	+5,6%
Households' consumption	-1,7%	+1,9%
Exports (volume)	-1,2%	-0,3%

The 2 reform schemes are compared to a higher legal retirement age (> 3 yrs.)

And the argument of fairness?

A Trade-off Between Equity and Efficiency

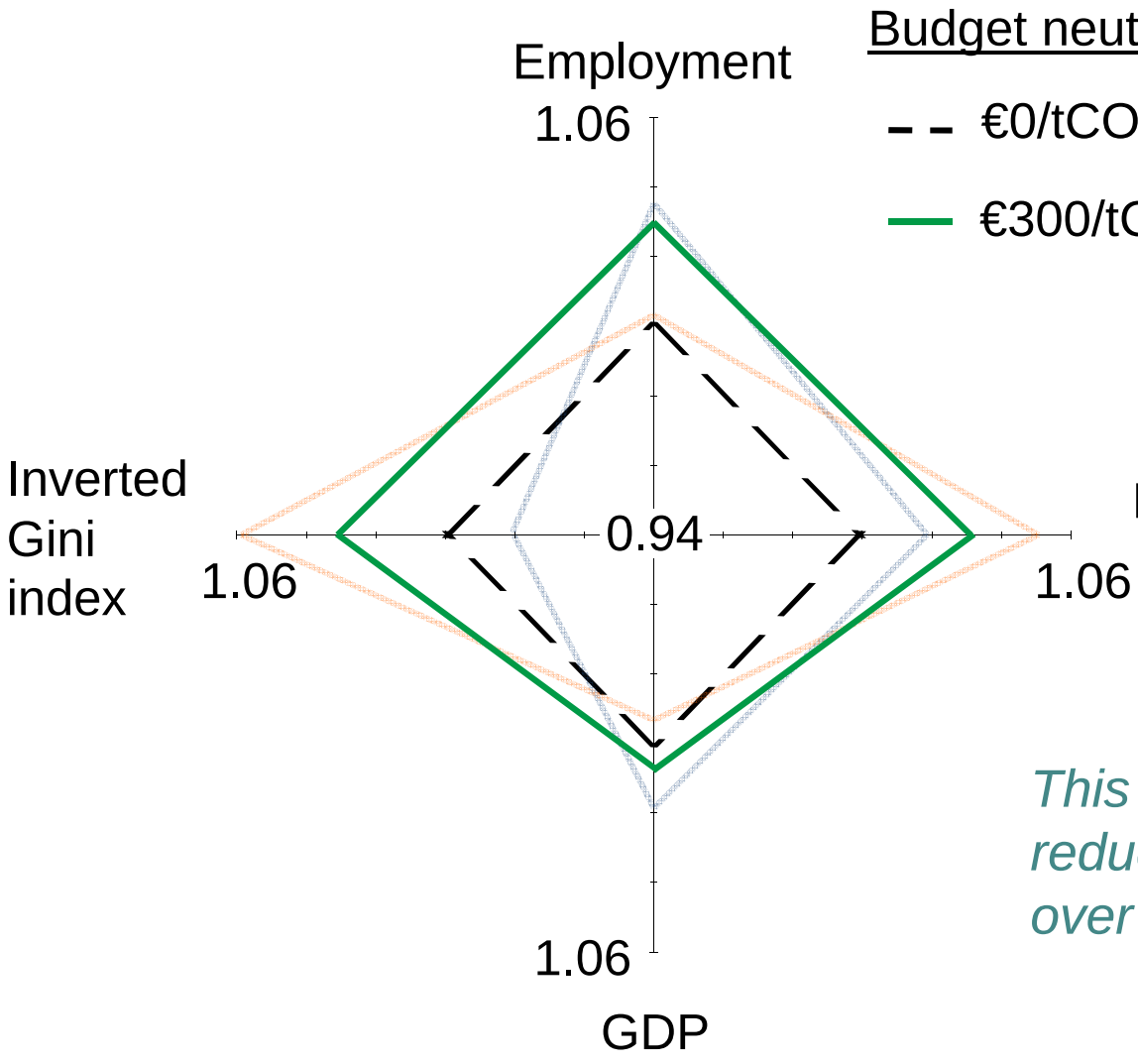


Budget neutral reform (Constant Debt/GDP)

- €0/tCO_2 Historical France (2004)
- €300/tCO_2 - Lower Social Contributions
- €300/tCO_2 - Transfers to households

The 2 schemes reduce CO_2 emissions by 34% over the period 1985-2004

But there is room for compromises



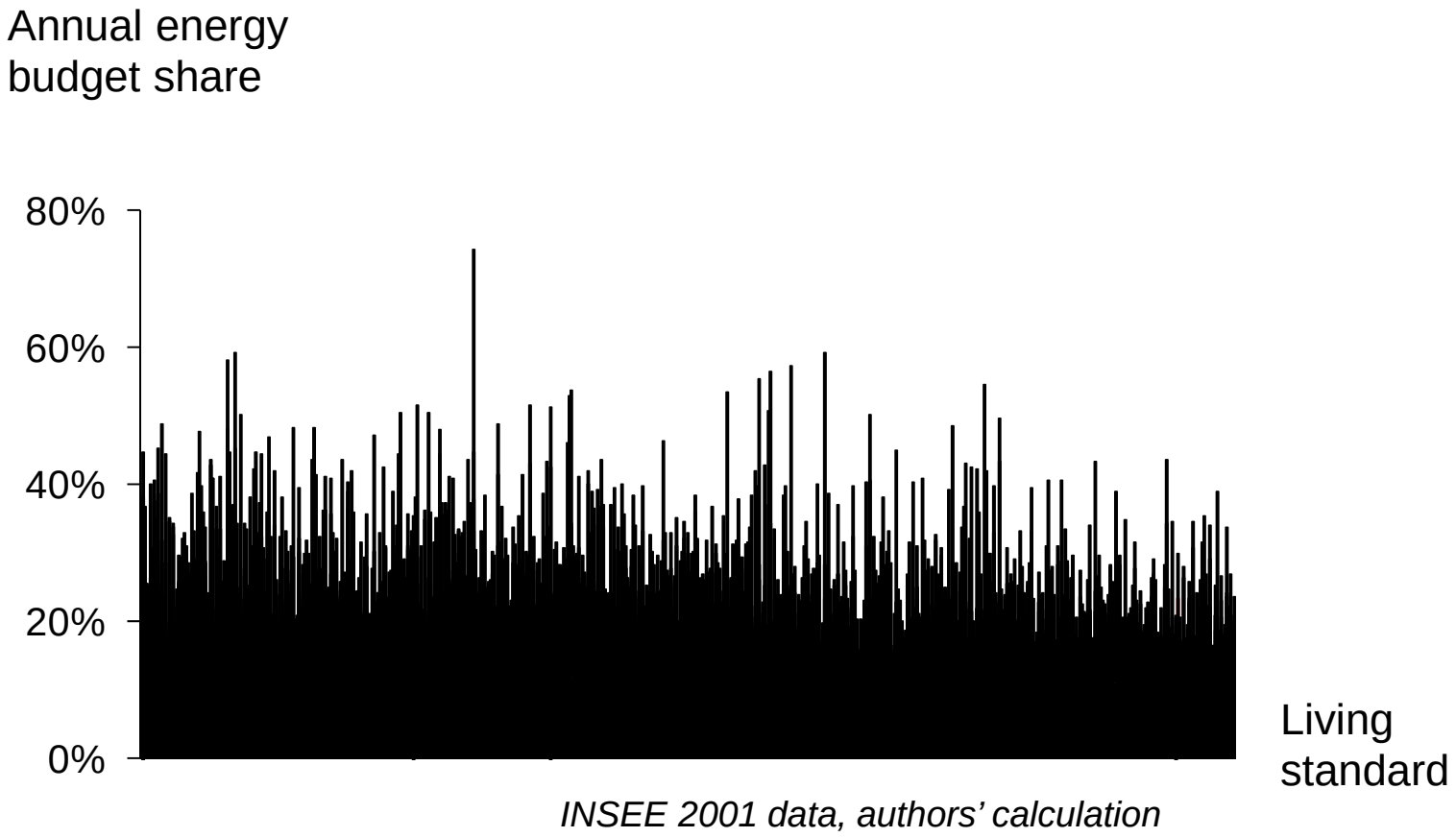
Budget neutral reform (Constant Debt/GDP)

– – €0/tCO_2 Historical France (2004)

— €300/tCO_2 - Targeted Compensations & Lower Social Contributions

This compromise scheme also reduces CO_2 emissions by 34% over the period 1985-2004

But energy vulnerability is ill-explained by ‘income’



INSEE 2001 data, authors’ calculation

A variety of technical, geographic and socioeconomic factors

Conclusion

Three crucial ‘parameters’ to find the best compromises

1. Balance between wage progression and control of costs

2. Coherence between policies (general reform of public finance)

3. Targeted support towards the most vulnerable to energy prices

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