

Applying system analysis to understand food value chain dynamics, the case of VALUMICS H2020 project

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Understanding food value chains and network dynamics

Horizon 2020 funded research and innovation project



UNIVERSITY OF ICELAND
FACULTY OF INDUSTRIAL ENGINEERING,
MECHANICAL ENGINEERING AND COMPUTER SCIENCE



VALUMICS
Food Systems Dynamics



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from the European Union's
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Scale of the VALUMICS project

Project budget

Budget of 6.3 million EURO

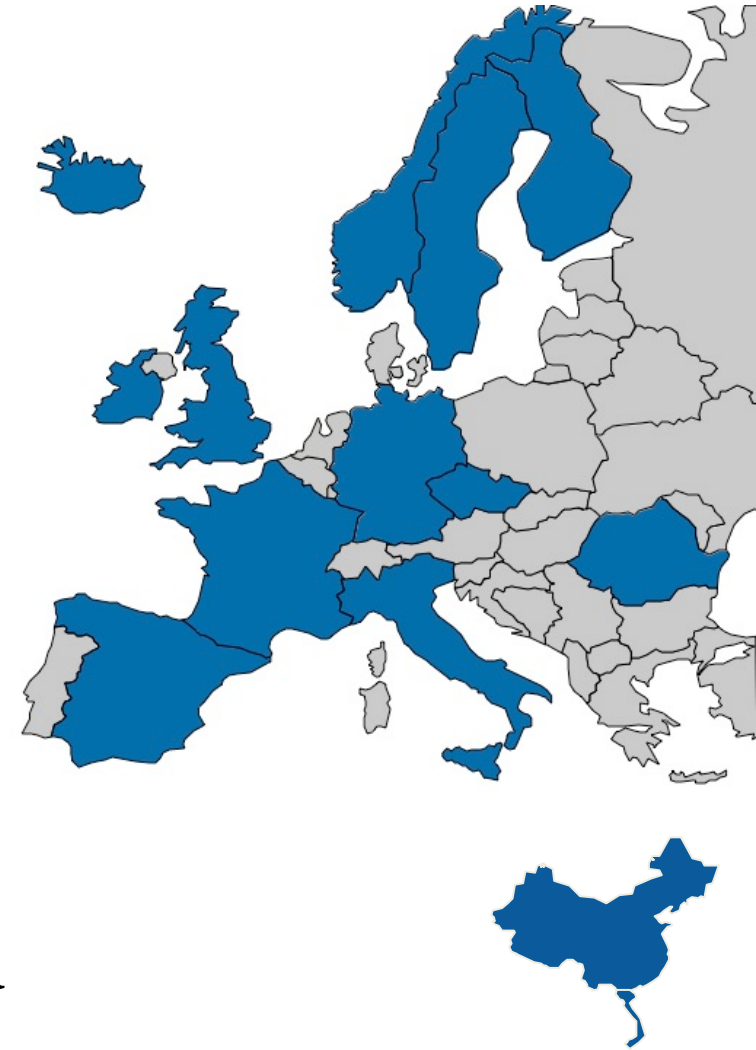
The EU Grant of 6 million EURO

A four year project:

1 June 2017 to 30 May 2021

21 participating organisations

The consortium driving the VALUMICS project has a core of 19 European partners from 14 countries, and two Asian partners, China and Vietnam



Objectives of the VALUMICS project

- To provide decision makers throughout food value chains with a comprehensive suite of approaches and tools
- To enable them to evaluate the impact of strategic and operational policies
- To enhance the resilience, integrity and sustainability of food value chains for European countries



Objectives of the VALUMICS project (2)

- To provide improved understanding and models underpinning policy recommendations,
- enabling advice aimed at decision makers with key roles and required capacity
- to enhance the resilience with respect to sustainability of strategic food value chains in Europe



VALUMICS will implement a holistic approach and causality based system framework,

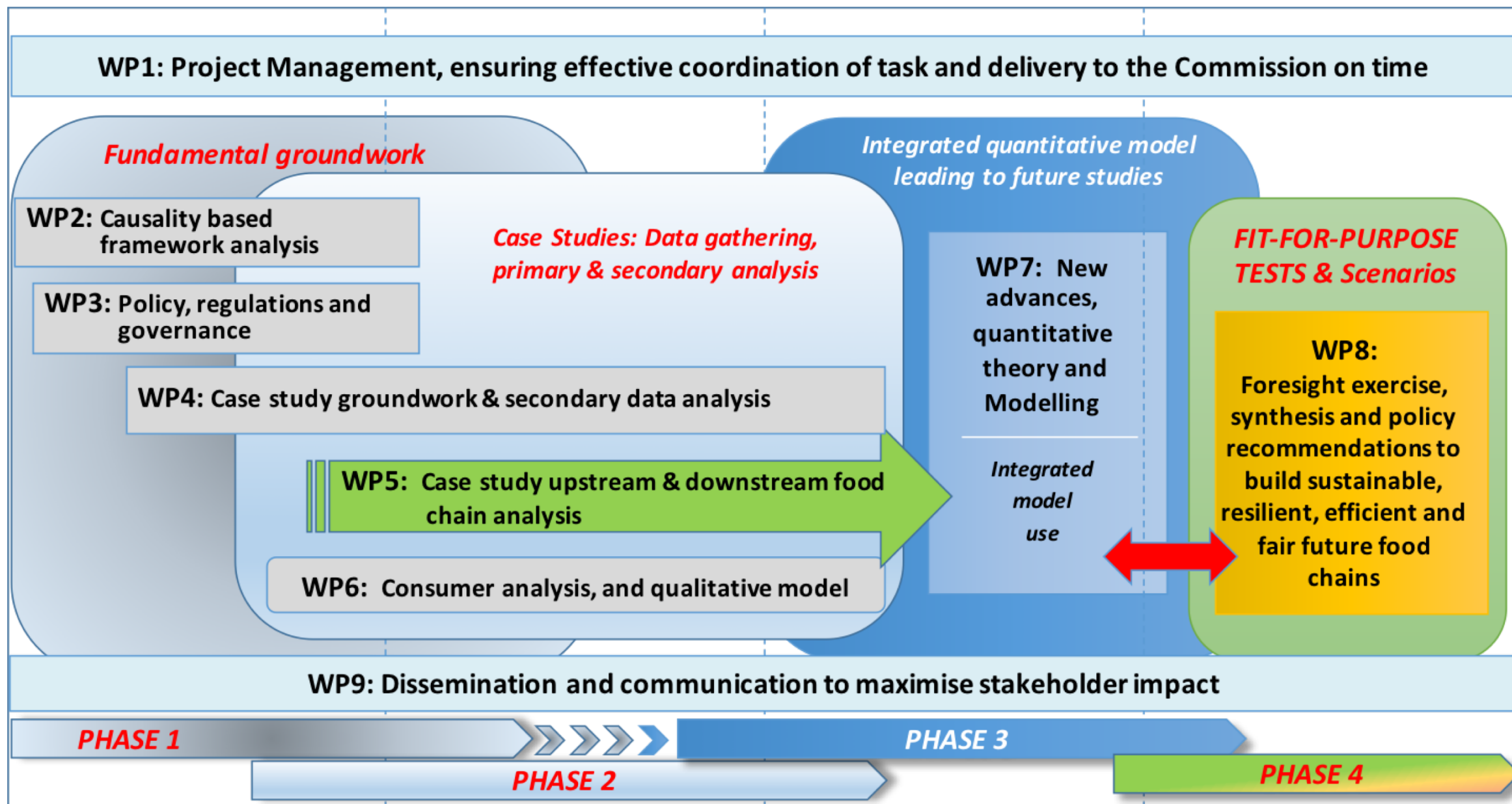
- supported by new advances in theory,
- modelling and data gathering,
- to capture and understand the dynamics and interactions in food systems

Main activities

Work structure organized and phased flow of phased work processes:

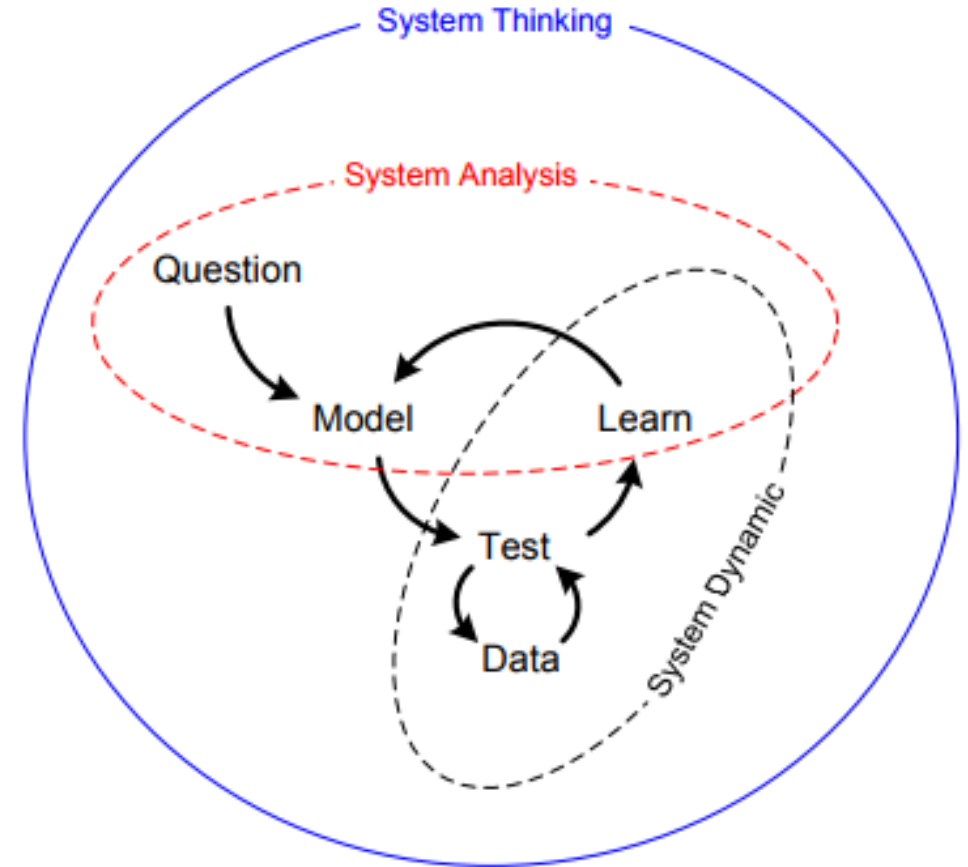
- ✓ *Phase 1: Development phase* Fundamental groundwork
- ✓ *Phase 2: Integration phase*
Case studies, data gathering primary and secondary analysis
- ✓ *Phase 3: Exploration phase* Integrated quantitative model leading to future studies
- ✓ *Phase 4: Policy and use phase*
Fit for purpose tests and scenarios



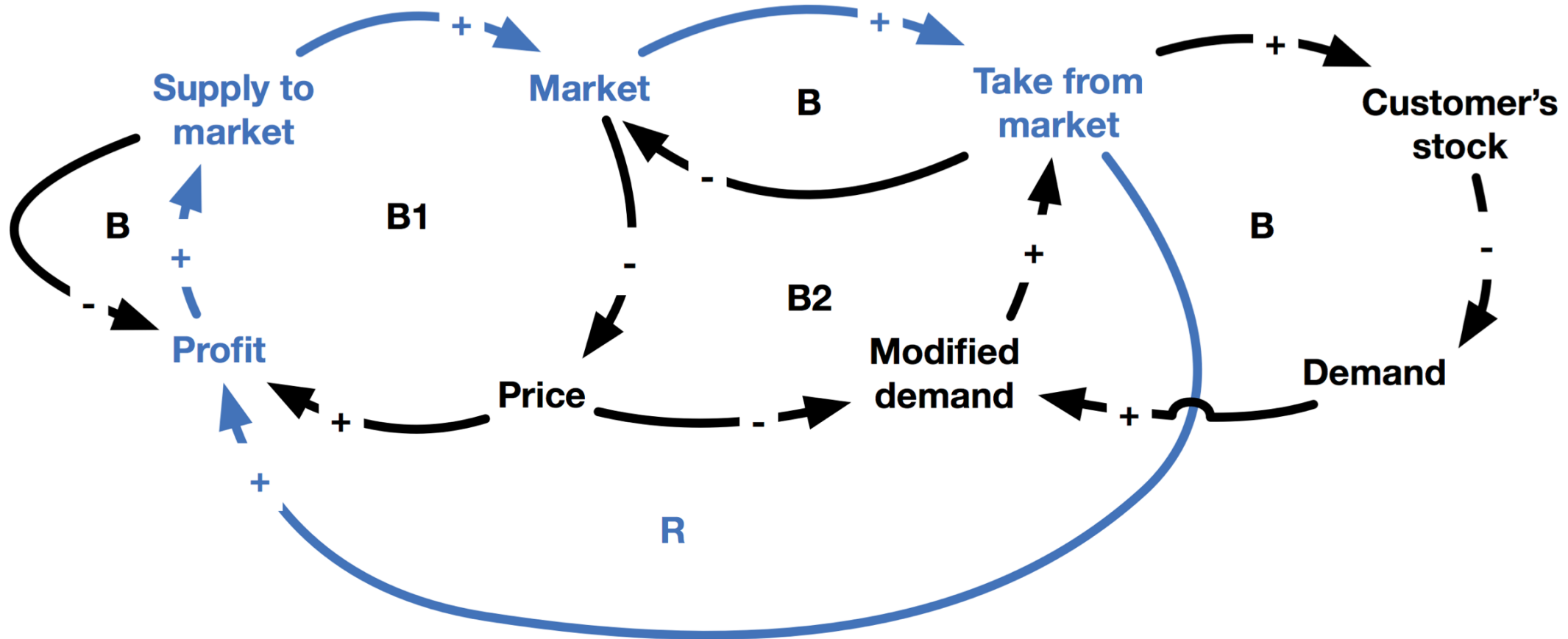


Overall approach and methodology

- the causality dynamics framework will be applied as a methodological approach,
- will be implemented as a key driver of the project work
- joint partner workshops
 - involving stakeholders
 - causality loop framework will be built with involvement of all participants

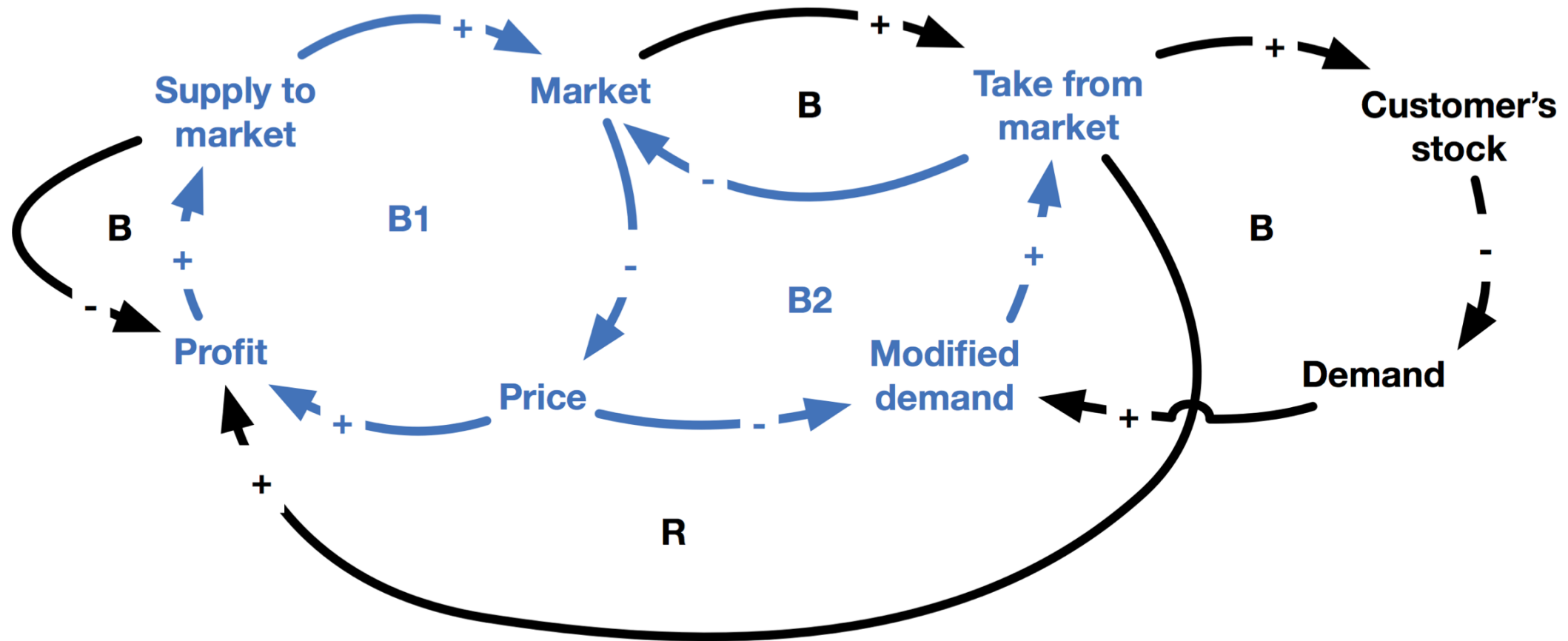


The feedback structure of a supply system



Reinforcing profit loop

The feedback structure of a supply system



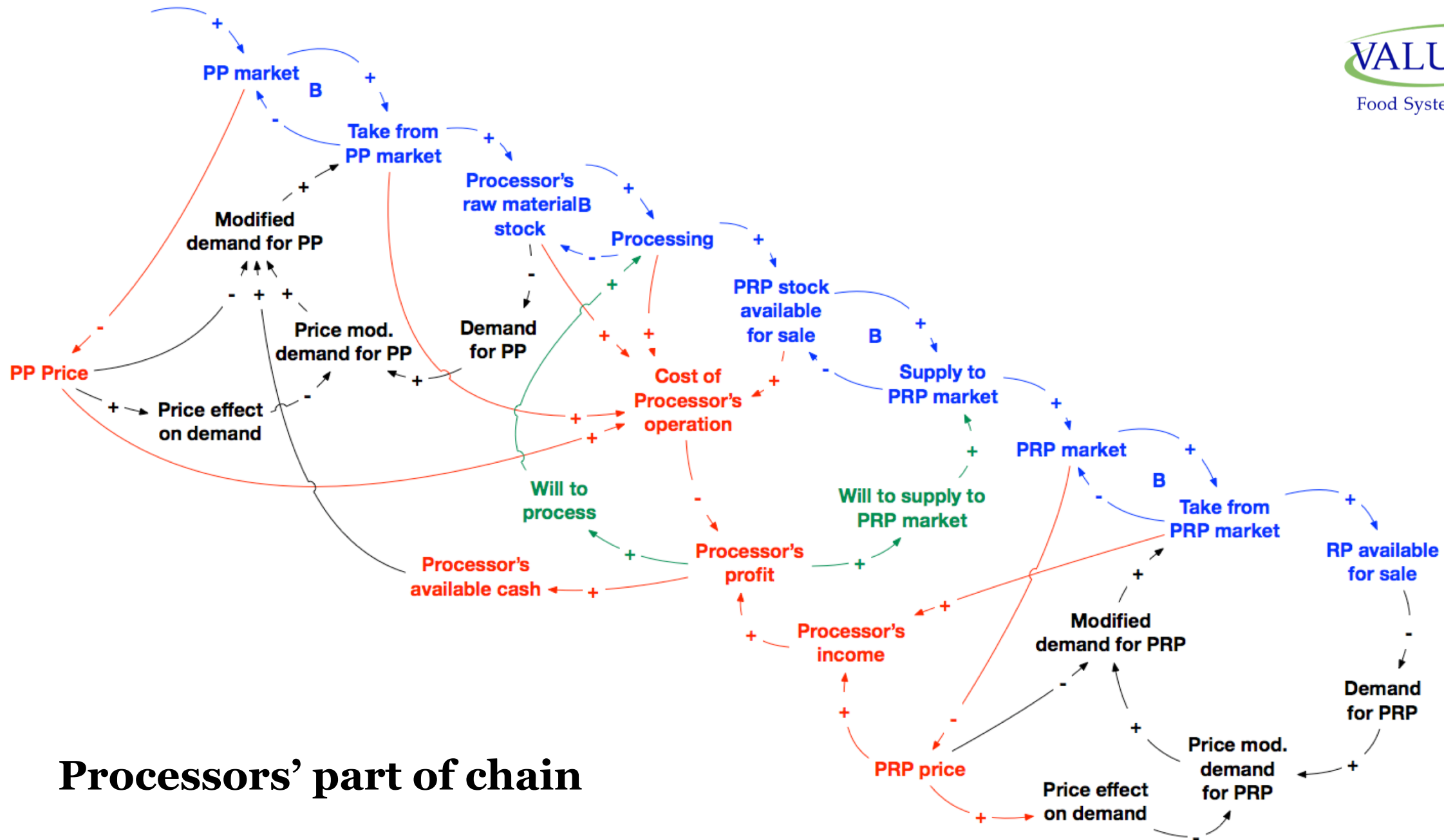
Balancing market dynamics

Supply loop (B1) & Demand loop (B2)



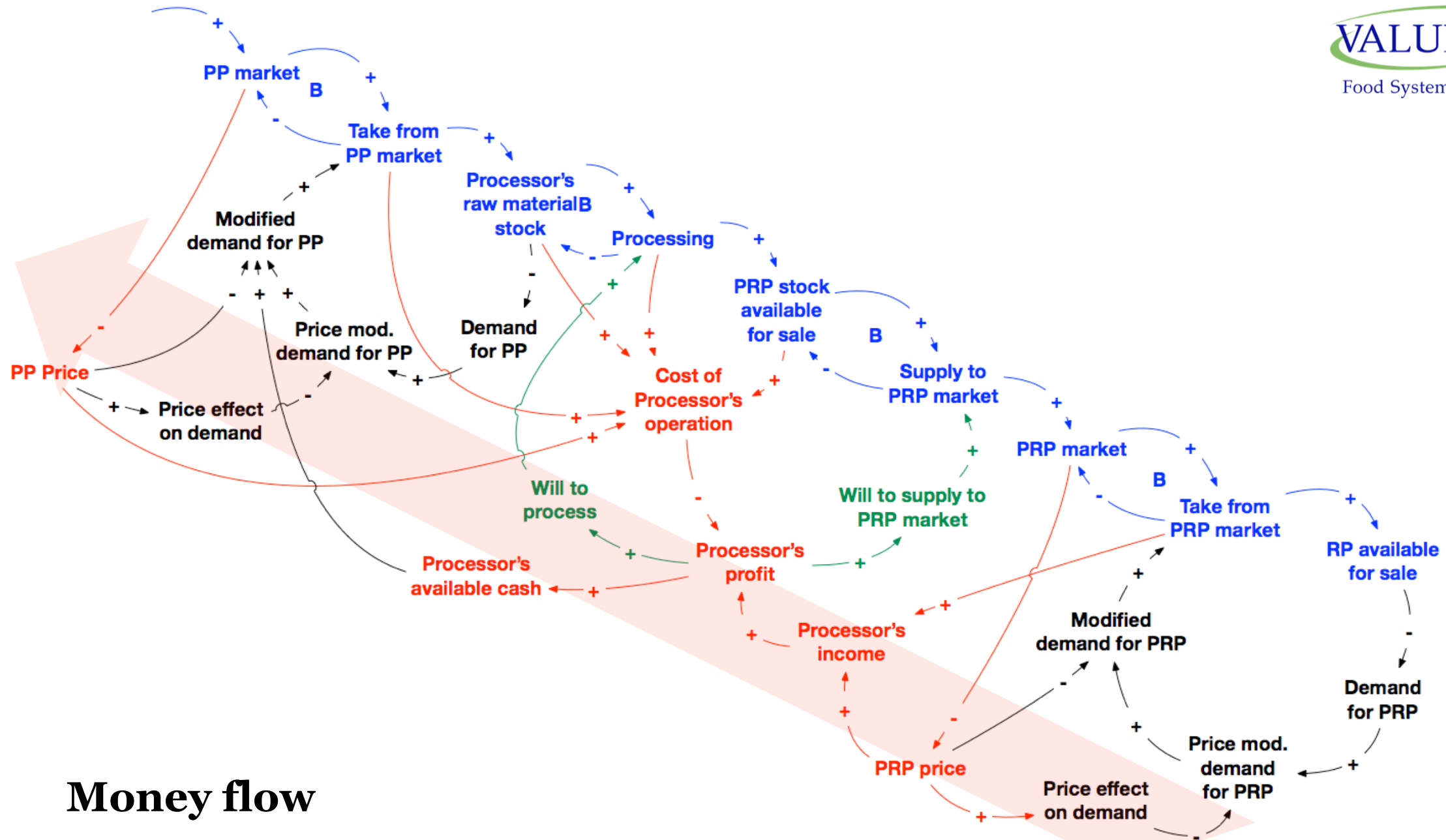
CLD of an integrated supply-, value- and decision chain



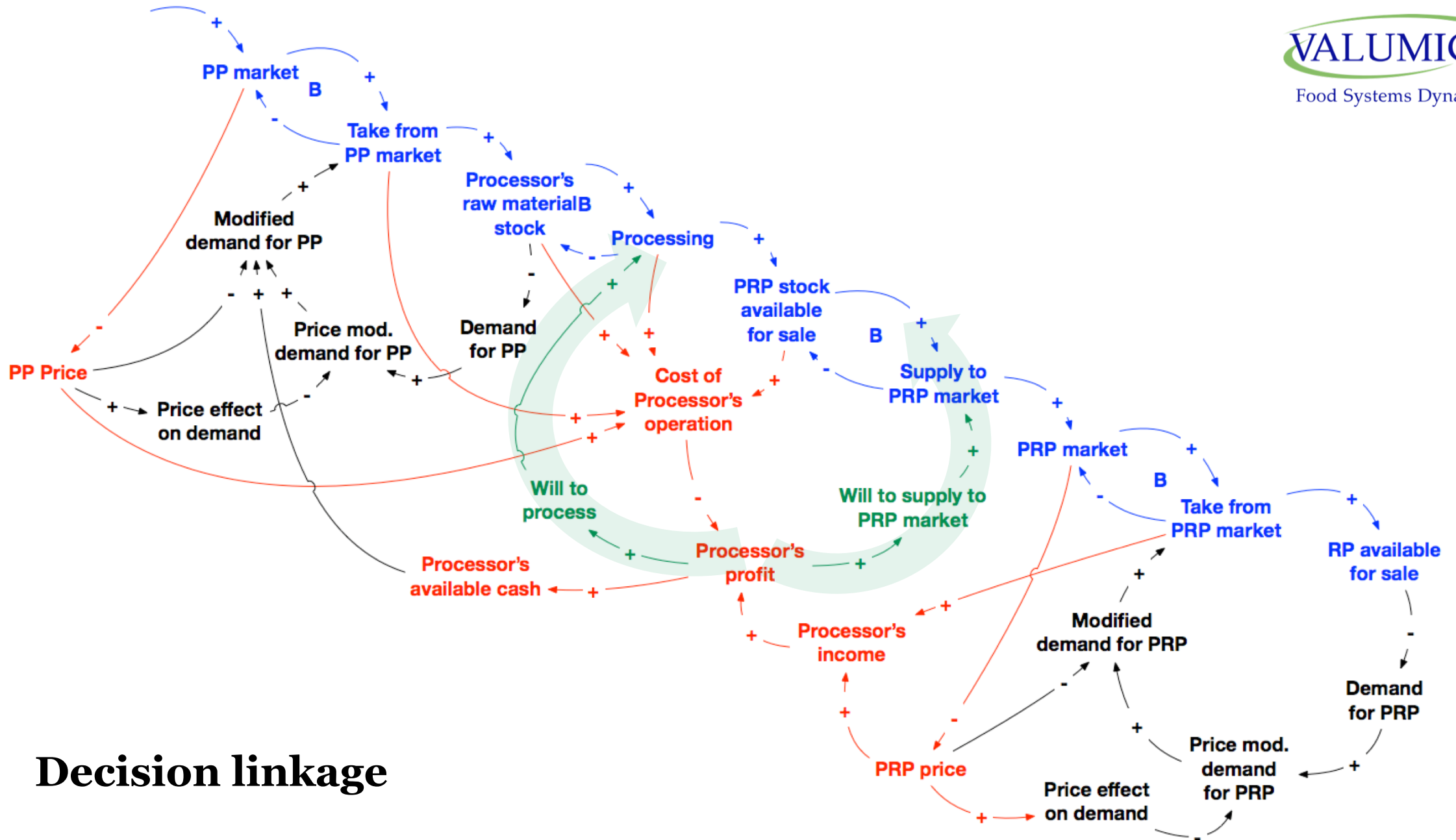


Processors' part of chain





Money flow

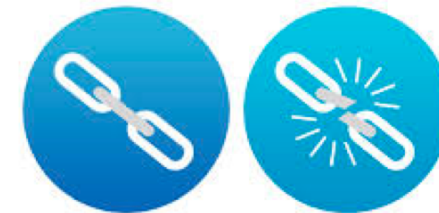


Decision linkage

Market mechanism

Final remarks on CLD approach

- The eventual purpose of the dynamic CLD model is to use it to evaluate policies aimed at improving the **sustainability** and **resilience** of food supply systems
- ✓ But why is the profit driven feedback structure of such systems important in that regard?
 - Restricted focus on short-term profit means increasing **efficiency** and **effectiveness**
 - Overemphasizing **own interests**?
 - ↑ risk of loss of resilience and sustainability

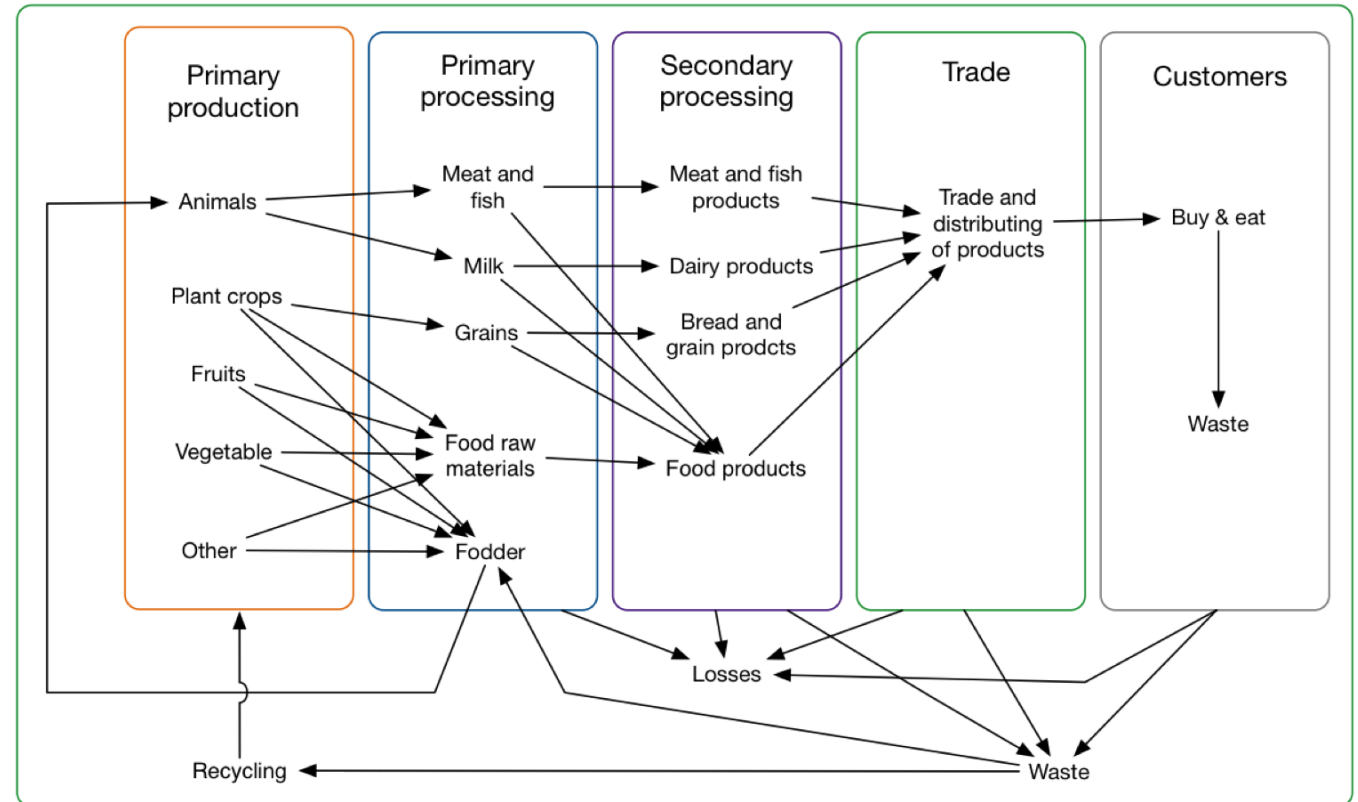


Important to understand the underlying feedback mechanisms that generate behavior in the systems, including profit generation and market dynamics

The food value chain & food systems

Food Value chains:

- The food value chain is comprised of the stages of the path of the food products starting with inputs, primary production, manufacturing, logistics and transportation, grocery and retail sectors until consumers



Food Systems:

- Food system comprises the food value chains/networks and in addition, waste management and all the supporting and interacting activities

VALUMICS expected outcomes

- Improve knowledge on food chains and their underlying drivers
- Deliver a comprehensive assessment of all dimensions of the sustainability, performance and resilience of food chains and their contribution to jobs and growth, both territorially and at EU level
- Improve capacity to model the sustainability and resilience of food chains
- Enhance capacity to assess the functioning of value chains, upstream and downstream chain flows, and price transmission along the chain

VALUMICS expected outcomes (2)

- Increase capacity to map the occurrence of unfair practices in the food chain and develop approaches to assess their impact
- Clarify the development of added value and profit margins in food value chains and how these are distributed at each level
- Increase understanding of how consumers' demand and consumption patterns affect the organization of food chains (and vice versa), and their sustainability and resilience
- Improve the capacity of relevant policies and food chain stakeholders to improve food chain sustainability and resilience

VALUMICS Participants



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Stakeholder involvement at the launch of VALUMICS



More to join as the project progresses



Food Systems Dynamics

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Staying in touch...

<http://valumics.eu/sign-up/>

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