

2018 Experts Meeting on Co-operative Accounting and Reporting Co-operative Socio-economic Transformation

Is value added a reliable indicator for the measurement of the
economic contribution of cooperatives?

Some insights from on a critical review of the academic (economic) literature

Marie J. Bouchard ¹ Madeg Le Guernic ² Damien Rousselière³

¹Professor, UQAM, Canada

²PhD Student, University of Rennes, France

³Professor, AGROCAMPUS OUEST, France

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- 1 Introduction
- 2 Some Elements on Value Added
- 3 Microeconomic level
- 4 Macroeconomic level
- 5 Measurement methods
- 6 Concluding Remarks

The short story

Is value added a reliable indicator for the measurement of the economic contribution of cooperatives?

the beginning of the story : The 2013 ICLS Resolution no. III recommended that cooperatives be measured referring to value added ("in absolute numbers and as a percentage of total GDP")

Our Answer

No if measured at the cooperative level as

- it does not take into account specific features of what is a cooperative
- it can change dramatically for other elements than a increase in wealth

An advice : Please don't provide the share of the cooperative sector as a % of the economy any more. Instead provide it as a share in employment, enterprises...

Yes, in part,

- if measured at a broader scale and once considering cooperative specificities such as patronage refunds and transactions with or without members
- and once using the right tools
- but sufficient human and financial resources are needed

and these adequate resources are (at the time being) lacking...

Some Elements on Value Added

Why do people believe in Value Added ?

- GDP (Gross Domestic Product) is the sum of VA. Growth is simply the increase in VA for a given period. Important for the (sustainability) of Public Finances (and therefore for official statistics public agencies) as there is a strong correlation with the amount of collected taxes (on value added, on labor, on income, on profit...) (Haller & Stolowy 1998 ; Keen & Lockwood 2010).
- At a microlevel : because it is a proxy of the capacity of the enterprises to remunerate the various production factors (Labor, Capital) (Askenazy 2013)
- VA can be adapted to take into account non-market production (at the costs or even for the quality change), globalization (outsourcing in foreign countries), ...

Therefore, one can think, as for nonprofit organization,

- Economic contribution of cooperative sector will be simply the share of Value Added in a given economy.
- with some adaptation for Cooperative Banks ("Financial intermediation Services indirectly measured" (FISIM)), Social Cooperative (with non-market production)

Some Elements on Value Added

Seminal Works from Gérard Deshayes

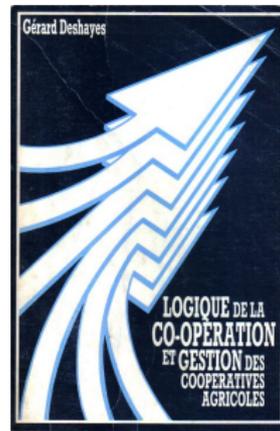
For Cooperatives which are not workers cooperatives, Deshayes (1988) states that value added and net surplus don't have any economic meaning in the case of the cooperative as it only reflect specific remuneration policies

- For a marketing cooperative, the producers income is, on one hand, a part of value added (patronage refunds or interests on social shares) and it is, on the other hand, a reduction of value added (payment of raw material).
- For a consumer cooperatives, high price and high patronage refunds lead to same members expenses as a situation with low price an low patronage refunds

These different remunerations policies may simply depend on

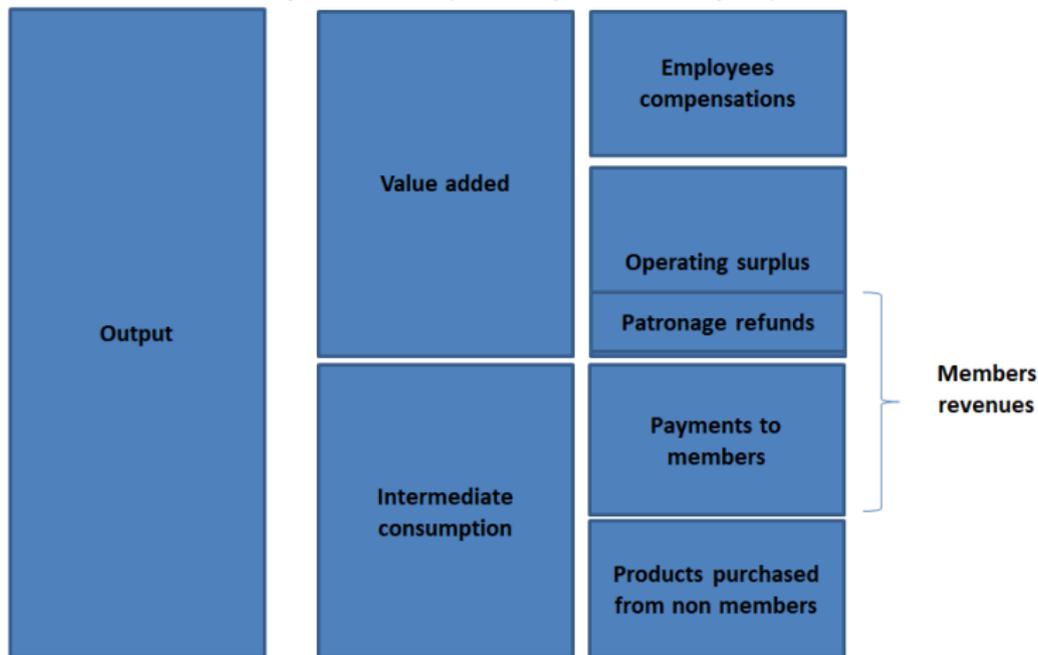
- the level of competition
- the members being or not risk adverse
- the psychosociological view of the board

Some examples from the Report on Economic Contribution



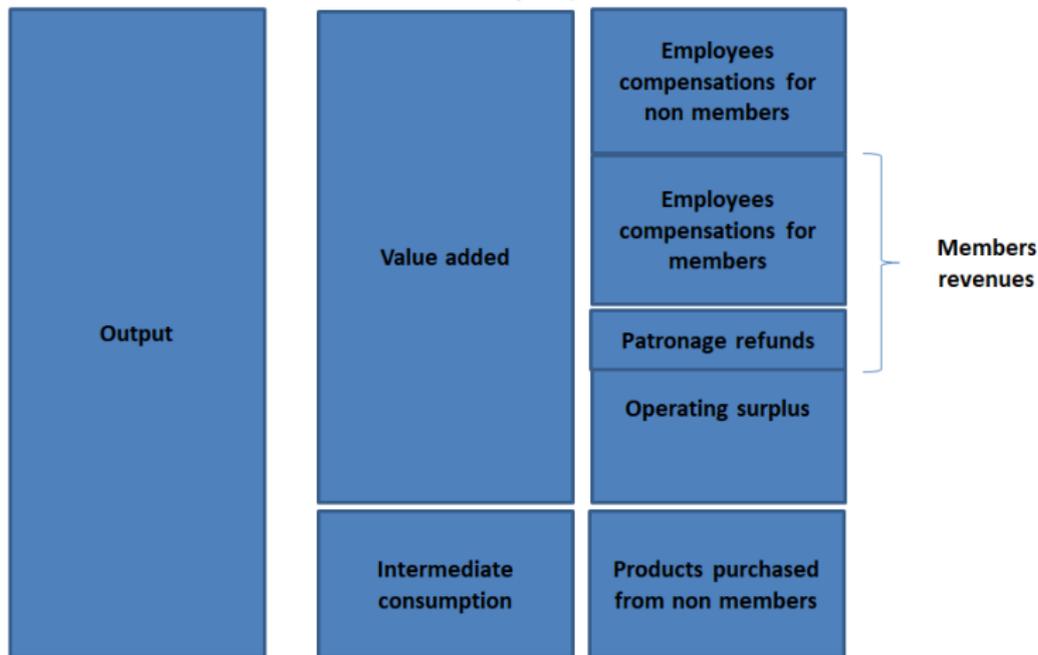
Some Elements on Value Added

The problem of value added for a (marketing) producer cooperative (a simple example)



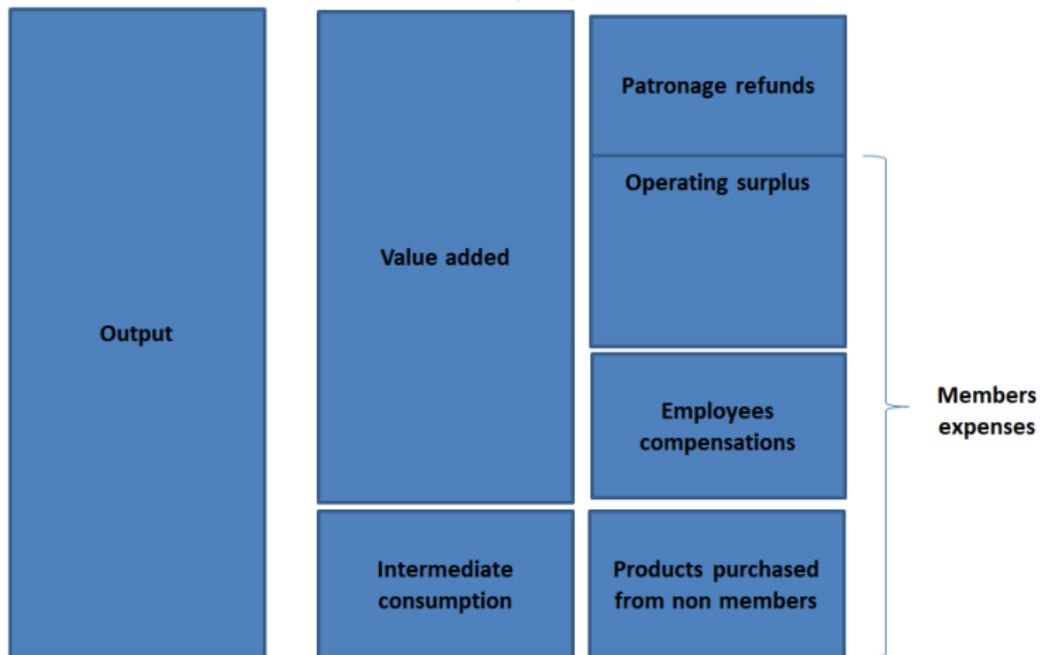
Some Elements on Value Added

The value added for a workers cooperative (a simple example)



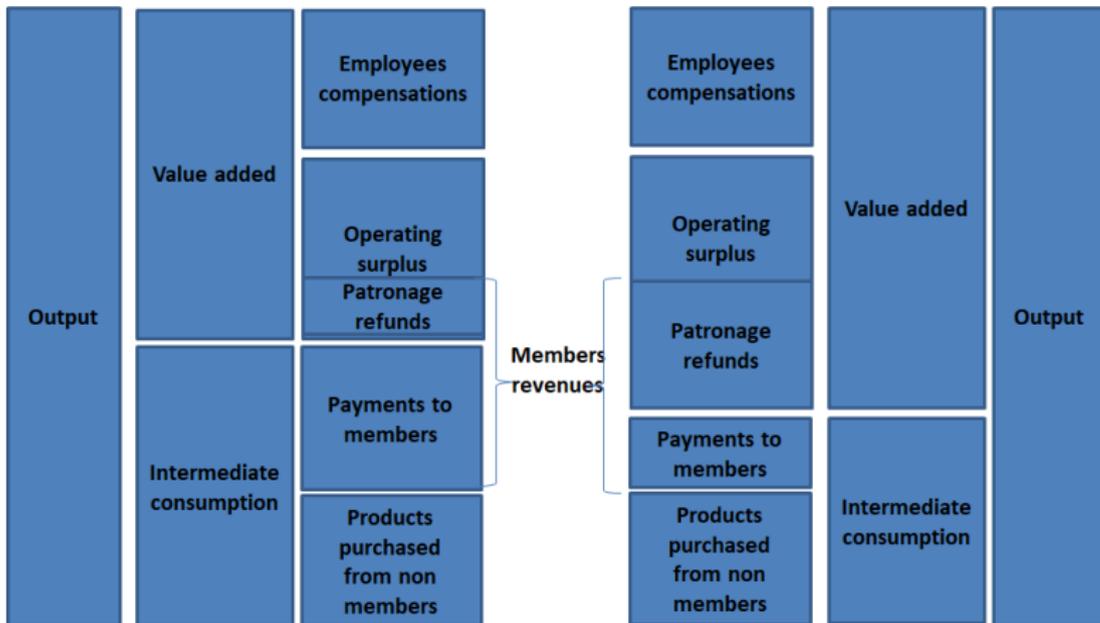
Some Elements on Value Added

The value added for a consumer cooperative (a simple example)



Some Elements on Value Added

Two different remunerations policies (decided by the board) for the same members revenues



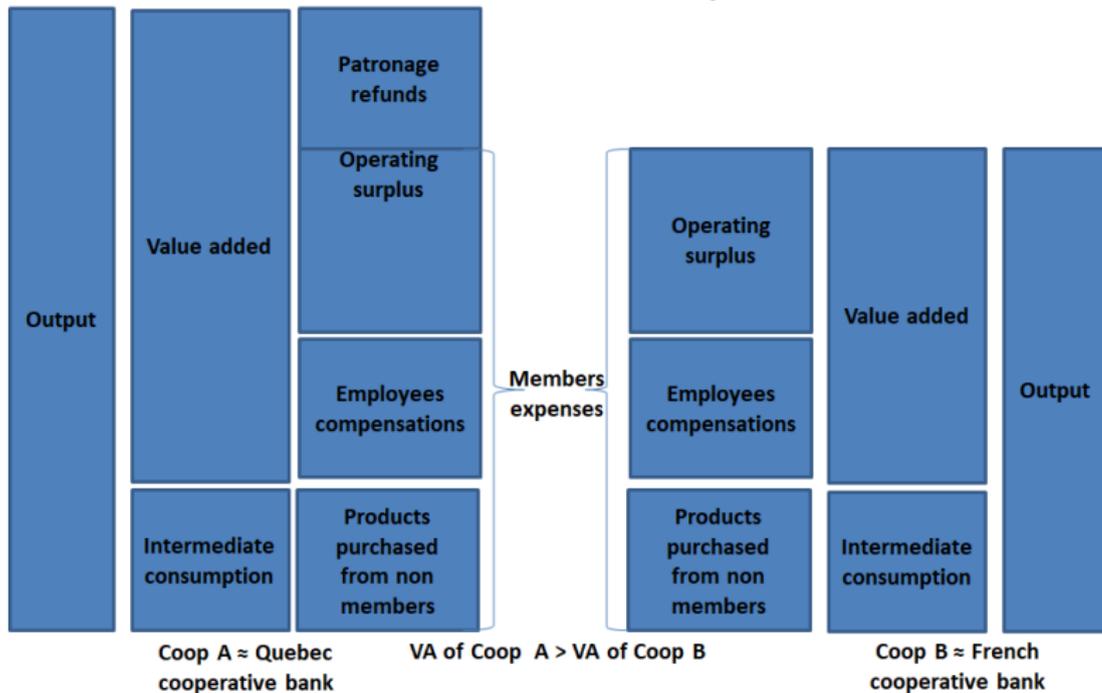
Coop A ≈ French or German Dairy Coop (see Soboh et al. 2011)

VA of Coop A < VA of Coop B

Coop B ≈ Irish Dairy Coop See Boyle 2004

Some Elements on Value Added

Two different price policies (decided by the board) for the same members expenses



Some Elements on Value Added

- Declerck (2013) notes that value added is relevant only in the case of a cooperative that faces economic difficulties : the capital provided by the members can in that case be considered as a product under-risk as in a for-profit organization.
- We present various alternative indicators in the report : "Cooperative Added Value" (Balaguer & Castellano 2012), "Shared Value" (Deshayes 1988)... but none of these indicators can be used in order to provide a weight of the cooperative sector in % (as there is double counting)
- A statistical recommendation : Identification of the economic specificities of cooperatives in administrative registries and surveys : patronage refunds, transaction with members and non-members ...
- ... in order to feed economic models for assessing the economic contribution

Alternative (simple) economic indicators

	Data	Interests	Limits	Best for...
Value Added	Available in most accounting databases or surveys. Available in few case in census (questions on intermediate consumption are needed)	No double counting Direct estimation of the cooperative sector as a share of GNP	May only reflect internal strategies (payment policies or prices policy) and not real economic contribution as a share of value added may only be transferred to members	Workers cooperatives
Turn Over	Available in most accounting databases, surveys or census	Information easy to collect Use in econometric comparison studies between cooperative and non-cooperative enterprises	Double counting The estimation may be ambiguous for cooperative banks	Producers cooperatives
Total Costs	Available in most accounting databases, but not in survey or census (special questions are needed)	Use in econometric comparison studies between cooperative and non-cooperative enterprises Reasonable hypothesis that most organizations have the objective to minimize costs	Not suitable for producer cooperatives as payments to the members are incorporated into costs.	Consumer cooperatives and cooperative banks
Coop Added Value	Comprehensive accounting databases are needed (patronage refunds, difference in intermediate consumption paid to members and non members...)	Straightforward extension of value added calculation (to include some specificities of cooperatives) Take into account non-monetized value of the service exchange between members of the same cooperative	Limits of traditional value added still hold (may not be suitable for all the cooperatives)	Cooperative sector (in fact workers cooperatives)
Deshayes financial concepts (value received / value shared)	Comprehensive accounting databases are needed (patronage refunds, difference in intermediate consumption paid to members and non members...)	Reflect the ability of the cooperative to generate enough cash flows (value received) or to renew its assets (value shared) to satisfy the needs of its members	Specific data (costly to collect) Double counting	Cooperative sector

What is Economic Contribution ?

According to Watson et al. (2007)

- Economic contribution can be defined as the gross change in economic activity associated with an industry, event or policy in an existing regional or national economy
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- Economic benefit is a net increase in total social welfare. Economic benefits include both market and non-market values.
- The purpose of the analysis of the economic contribution is to determine how much economic activity was associated with the industry, event, or policy.
- The purpose of the economic impact is to determine the causal effect of the given industry, event or policy.

What is Economic Contribution ?

Difference between Economic Impact and Economic Contribution

- Comparison with the counterfactual situation : What if there is no cooperative ?
- This "though experiment" is by essence controversial as missingness is inherent to the counterfactual definition of causal effects (Gelman 2011) / "causality is in the mind" (Heckman 2008)
- the various methods for economic contribution are based on various (un)testable assumptions. The question is simply to "pick the less lethal poison" (Gelman)
- because of these untestable assumptions academic consensus is needed (as data quality) as in other research fields (evaluation of public tax policies)

the question of interest is Why cooperative may lead to an increase of wealth (measured by VA or other indicators) ?

- it has impact on members (microeconomic level)
- and on the rest of the society (macroeconomic level)

Impact of Cooperatives on Members Performance

Most of the literature is on Agricultural Cooperatives.

Definition

In the literature : a loose definition of farmers performance : including Efficiency, Innovation (adoption of new practices), welfare and poverty, environmental performance (e.g. soil conservation)

Overwhelming economic literature (growing at an exponential scale)

- adoption of new practices (seeds, fertilizer...), revenues, production
- welfare, "middle class effect" proposition of Bernard and Spielman (2009) suggesting heterogeneous impacts
- technical efficiency, productivity
- non included : (entrepreneurial) attitudes, life satisfaction
- using (more and more) sophisticated methods in order to address potential selection bias (self-selection by farmers or selection by cooperatives) and therefore to establish a "pure" effect.

Impact of Cooperatives on Farmers Performance

- Exhaustive Database with 99 papers (in English / French / German / Spanish) and 1219 outcomes, from 1988 to 2016 (2017 to be shortly included)
- Loose and broad definition of cooperatives, farmers organizations, producers organizations
- Estimation of a simple model on the probability of a negative or positive impact with three types of dependent variables
 - the variables X_i corresponding to the nature of the publication : IF (Impact Factor) (Yes/No), Predatory or "Vanity" Publication, year (before or after 2013), Focus on the impact of coop (Yes/No)
 - the variables W_i corresponding to the design of the study : sample size (log), sensitivity analysis, bias analysis (taking into account potentially selection bias), Primary data (Yes/No), Europe (Yes/No), Fruits and Vegetable (Yes/No)
 - the variables Z_i corresponding to the nature of the coop : activity (Supply, Marketing, Services), type of impact (Innovation and Efficiency, Marketing, Environment, Production, Welfare)

Impact of Cooperatives on Farmers Performance

	Freq	%
Innovation / Efficiency	469	38
Marketing	210	17
Environment	13	1
Revenues / Production	432	35
Poverty / welfare	95	8

TABLE – Type of outcomes

Impact	Freq.	%
Negative and significant	96	9
Null	400	33
Positive and significant	722	59

TABLE – Distribution of the outcomes

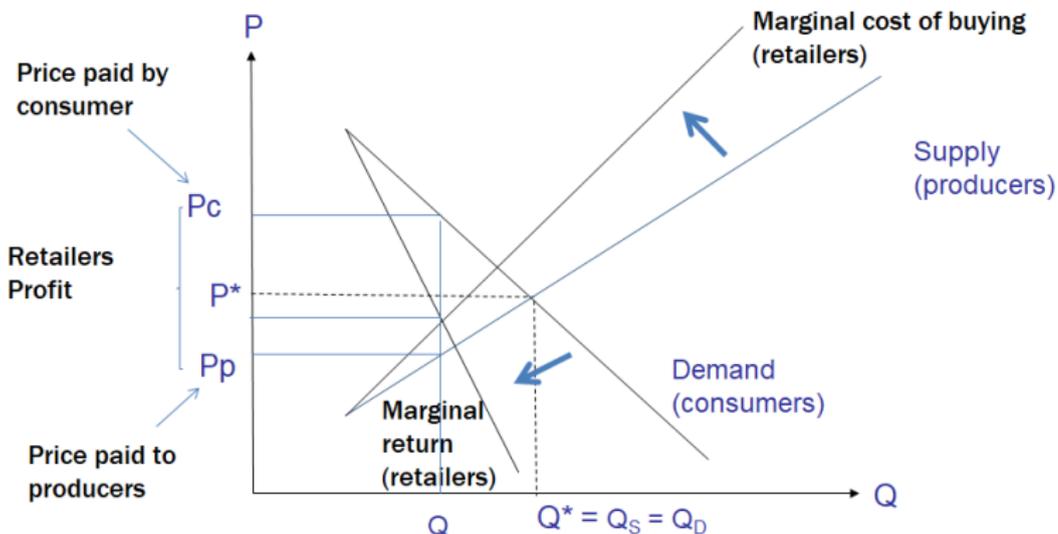
Contributions at a macroeconomic level

6 macroeconomic effects

- countervailing power (Hansmann 1996, Requillart 2007)
- Procompetitive effects (yardstick competition effect) (Nourse 1922, Fulton and Giannakas 2013). "Red Queen Effect" (Derfus et al. 2008)
- Effects on quality (included or not into price) (Jardine et al. 2014, Pennerstorfer and Weiss 2013...) (with mixed results)
- Missing Markets (Markets failures) (Valentinov and Iliopoulos 2013...)
- Economic stability : resilient enterprise (Bouchard and Rousselière, 2016 ; Pape et al., 2016), stabilizing effect on price (Muller et al. 2017)
- Capital and Assets Accumulation (Gordon Nembhard 2014). Cash flow vs stocks

Countervailing power

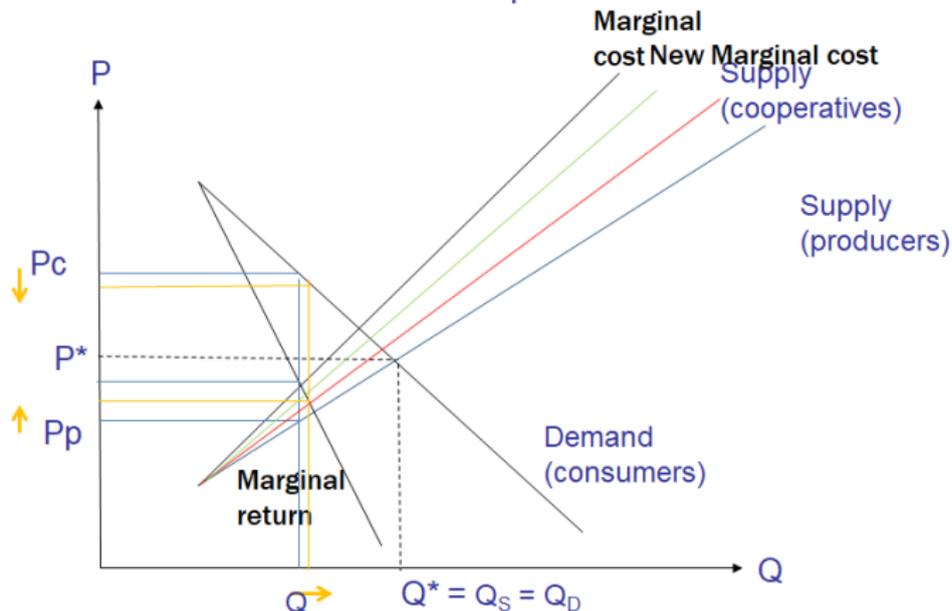
In a context of B to B market and with a oligopolistic downstream market (against producers) and/or with oligopsonic upstream market (against consumers) powers (retailers or processors).



Countervailing power

For economists promoting cooperatives is therefore a 2nd best solution (e.g. Fruits and Vegetables Common Agricultural Policy) (Requillart 2007)

In case of Producer cooperatives



Procompetitive effects

Yardstick competition effect / procompetitive effect (see Fulton & Giannakas 2013 ; Van Herck 2014)

Definition

The more powerful Cooperatives are, the higher the prices that members and non member receive for their products. In the long run, prices are expected to be lower in markets where cooperatives represent a higher market share.

Empirical evidence in various industries and various countries (Europe : Hanisch et al. 2013 or Worldwide : Milford 2012, Balineau 2012)

- Negative relationship with the market share of cooperatives and the aggregate price on the market
- Price paid by cooperatives to farmers are higher than those of the For-Profit Enterprises

Credit unions have a procompetitive impact on bank and thrift deposit pricing (as documented by a paper of the US Federal Reserve Hannan 2003).

Procompetitive effects

At the macrolevel, another interesting byproduct is the impact on prices volatility (Muller et al. 2017) : the authors found that (in the European milk industry)

- number of processors decreases the price volatility
- but a high market share of cooperatives decreases also this volatility

At the microlevel, cooperatives secure also farmers investments and may in part reduce farmers propensity to overinvest (Artz 2014).

Cooperative banks have explanatory power for macro-economic stabilization during the crisis years, but only above a certain market share threshold (Chiaramonte et al. 2015, Köhler 2015)

However

Procompetitive effects

Impact of governance

- Procompetitive effects are higher in the case of open membership but may disappear if the membership is closed (Fulton & Giannakas 2013)
- on the other hand increasing heterogeneity may threaten the stability of the cooperative (in case of complete pooling) (Merel et al. 2015)

Cooperatives have lower switching costs (for banks : Egarius & Weill 2016, for energy : Sagebiel et al. 2014) ; therefore the question of commitment may be a key point for the survival of these organizations.

Procompetitive effects

cooperatives in fruit and vegetables are required to sell the entire production of their members, with exception for on-farm sales

- In a previous paper (Agbo, Rousselière, Salanié 2015), we show that this side-selling may have positive impact on welfare (for both farmers and consumers, who ask for more diversity) only when there is a clear separation between markets (local market vs international market).
- This "healthy emulation" has been documented in some case studies edited by the French Federation of Agricultural Cooperatives.

"Microeconomic Measurement Tools"

Microeconomic methods	Objectives	Data	Sources	Interests	Limits
Econometrics of causal inference	Net impact of a cooperative on its members.	Depending on the nature of the impact. Data on members and non-members (control sample)	Survey, census, experimental data	Known and widely used methods (implemented in proprietary and open source software)	Absence of indirect effects (SUTVA hypothesis) and macroeconomic effects.
Farm / entreprise simulation	Economic impact of a decision on the organization	Comprehensive dataset on the organization (bioeconomic model for agricultural cooperatives)	Accounting database, survey, auxiliary data	Known and widely used methods in agricultural economics	Ad hoc modelling. Problem of micro/macro bridge. At this stage, only for producer cooperatives.
Cost Benefit Analysis	Interest of a decision (and eventually ranking among alternatives)	Depending on the decision evaluated (at the organization and/or at the individual level) Data on economic activity and public transfers and savings	Accounting database	Computational simplicity. Known and widely used methods	Explicit absence of indirect and macroeconomic effects
EVAS	Account for monetized and non-monetized factors to provide a better picture of economic contribution	Data needed on the various stakeholders	Accounting database, economic informations on stakeholders	Comprehensive approach Including social, environmental and economic impacts	Costs for collecting data. Problem of micro/macro bridge

"Macroeconomic Measurement Tools"

Macroeconomic methods	Objectives	Data	Sources	Interests	Limits
Headcount models	Inventory of the relative size of the cooperative sector	Depending on the comparison (value added, assets, revenues, employees...)	Survey, administrative registries	Simplicity / inexpensive data collection	Measuring economic contribution (no multiplier effects) Static measurement
Input output models (partial SAM)	Measuring economic impact (direct, indirect and induced effects)	Value added, patronage refunds. Purchasing and selling of goods and savings	Survey, administrative registries Hypothesis are made in the absence of data on the behavior of cooperative	Known and widely used methods (building on previous estimations)	Implicit hypothesis on the absence of macroeconomic effects of cooperatives Hypothesis can be unrealistic for the economic behaviors or on market structures (see Uzea 2014) Static measurement
Full SAM (Social Accounting Matrix)	Analyzing distributional aspects of cooperative	Value added, patronage refunds. Purchasing, savings, investment Economic Information on members	Survey, administrative registries Hypothesis are made in the absence of data on the behavior of cooperative	Known and widely used methods. More realistic than previous methods (distributional aspects)	Implicit hypothesis on the absence of macroeconomic effects of cooperatives Hypothesis can be unrealistic for the economic behaviors or on market structures (see Uzea 2014) Static measurement

"Macroeconomic Measurement Tools"

	Objectives	Data	Sources	Interests	Limits
CGE (Computable General Equilibrium)	Measuring a net economic impact (take into account macroeconomic effects) This impact can be forecasted	Data needed to calibrate the model for the various economic agents and the various market	Survey, administrative registries Hypothesis are made in the absence of data on the behavior of cooperative	Dynamic measurement. Non-linear effects	Academic consensus is needed (no attempt at this stage on the cooperative sector) Hypothesis on the homogeneity of the cooperative sector.
Microsimulation	Measuring a net (heterogeneous) economic impact (take into account macroeconomic effects)	Data needed to calibrate the model for the various economic agents and the various markets	Survey, administrative registries, experimental data, auxiliary data (on the socioeconomic environment)...	Realist modelling (take into account the heterogeneity of the cooperative sector)	Academic consensus is needed (few attempts for the cooperative sector)
Agent-Based Modelling	Two different objectives: theoretical models (testing theory) or evidence based models (providing forecasting estimates for various alternatives).	Data needed to calibrate the model for the various economic agents and the various markets	Survey, administrative registries, auxiliary data (on the socioeconomic environment)	Take into account non-linearity and threshold effects in the economy. Accommodate various nature of indicators (economic, social and environmental)	Academic consensus is needed (few attempts for the cooperative sector)

Concluding Remarks

- key point is to capture/measure all these economic effects when assessing economic contribution.
- As in the case for technology (see David (1985) on the "economics of qwerty"), there is a path dependency in economic contribution methods for cooperative studies. This path dependency largely favors input-output methods.
- Scientific controversies on the question of counterfactual at the macroeconomic level (because of countervailing market power, procompetitive effect, and missing markets) may lead national statistical agencies to be reluctant to use other methods than head-count or input/output approaches although, *paradoxically*, these methodologies made *also* untestable assumptions about such effects (implicitly presume the absence of such macroeconomic effects).
- The question of indicators is different if we want to compare economic performance of cooperatives and non-cooperative or measure the contribution of cooperatives to economy. The former issue is addressed routinely using a complete set of different methodologies and data (based on value or volume) in the academic literature.

thanks!!!! A Dilbert Thought for Cooperatives?



References

- "Conceptual Framework for the Purpose of Measurement of Cooperatives and its Operationalization", Official Publication of the ILO Available on http://www.ilo.org/global/topics/cooperatives/publications/WCMS_578683/lang--en/index.htm
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utility function

Fulton 1999 : "the preference of cooperative members to patronize a cooperative even when the cooperative's price or service is not as good as that provided by an IOF (Investor-Owned Firm)."

e.g. a simple case : consider a consumer with the following utility function

$$U_c = U - p_c + \lambda\alpha \quad (1)$$

if the product is purchased from the cooperative and

$$U_i = U - p_i + \mu(1 - \alpha) \quad (2)$$

if the product is purchased from an IOF

α is all other services provided by the cooperative.

members may value differently (λ) the other services.

Effect : commitment λ acts a "glue" (in case $p_c > p_i$).

in case of a low commitment and high price, members may exit the cooperative or force the board to a merger with an other cooperative or a IOF (see Banerjee et al. 2001).