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Methodologies to Measure the Economic Impact of Cooperatives: A Critical Review

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Abstract

The uncommon resilience of cooperatives in the aftermath of the 2008 global economic crisis has led to increased interest in measuring the economic impact of cooperatives and in unearthing the most appropriate method to be used. The objective of this paper is to conduct a critical analysis of the methodologies most commonly used to measure economic impact. The tradeoff between data requirements and computational complexity, and how well the model reflects the reality have made Input-Output the most common tool for economic impact analysis. However, several methodological issues need to be addressed when using Input-Output to measure the economic impact of cooperatives. Another important finding is that none of the methods captures the unique outcomes of cooperatives, such as countervailing market power, missing goods and services, or local economic stability. Additional analyses need to be conducted if an accurate assessment of the total economic impact of cooperatives is to be gained.

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Introduction

The uncommon resilience[2] of cooperatives in the aftermath of the 2008 global economic crisis (Birchall and Ketilson, 2009; Roelants et al., 2012; Birchall, 2013) has led to increased interest in the cooperative business model and the impact that cooperatives as a sector have on the economy. In 2009, the University of Wisconsin Center for Cooperatives (U.S.) produced the first comprehensive set of national-level statistics on the importance of cooperatives to the U.S. economy (Deller et al., 2009). Also, in 2010, the Measuring the Cooperative Difference Research Network (Canada) initiated a five-year project aimed at measuring the economic, along with social and environmental, impact of cooperatives at the national level (Measuring the Cooperative Difference Research Network, 2010).[3] In 2012, the first set of statistics on the contribution of the broad cooperative sector to the French economy was produced by Coop FR - les entreprises coopératives (2012). Prior to these nationwide initiatives, the analysis of the economic impact of cooperatives was generally limited to a province/state or regional economy (e.g., in Canada, see Ketilson et al. (1998) and Herman and Fulton (2001) for Saskatchewan; in the U.S., see for instance Coon and Leistritz (2001, 2005) for North Dakota, Folsom (2003) for Minnesota, McNamara et al. (2001) for the Great Plains and the Eastern Cornbelt, and Zeuli et al. (2003) for Wisconsin).[4]

There is thus growing interest in the most appropriate method to be used for measuring the economic impact of the cooperative business sector. At least two aspects need to be considered. First, cooperatives represent a unique business model (Mazzarol et al., 2011) that generates unique outcomes (Novkovic, 2008), such as countervailing market power, missing goods and services, and local economic stability, when compared to alternative forms of businesses. Hence, it is important to consider whether the standard methods used to measure the economic

2 Cooperatives succeed not only in a time of economic crisis, but also when the economy is good (see Mazzarol et al. (2014) for case studies of organizational resilience in the cooperative business model from around the world and across a wide range of industries; also, see Quebec Ministry of Economic Development, Innovation and Export (2008), Murray (2011), and Stringham and Lee (2011) for studies of the survival rate of cooperatives versus those of other business enterprises in various Canadian provinces).

3 Recent work on the economic impact of cooperatives also includes Leclerc (2010) for New Brunswick, Karaphillis (2012) for Nova Scotia, and IRECUS (2012) for the 300 largest cooperatives in the world.

4 The one exception that we know of is Cooperatives UK, who started to produce a comprehensive review of the UK's cooperative sector in 2007 (Cooperatives UK, 2007).

impact of a business sector are able to capture the unique outcomes of cooperatives. Second, it is important to distinguish between impacts at the local level versus national level. Locally owned by the people who use them, cooperatives likely contribute more to the local economy than other business structures – e.g., cooperatives purchase more of their inputs locally (The ICA Group, 2012) and return their net profits locally.

This paper aims to open up discussion on how the economic impact of cooperatives can be best measured. First, the paper undertakes a critical analysis of the methodologies that have been used to measure the economic impact of a business sector, in general, and the cooperative sector, in particular. As will be seen, methodologies differ in terms of data requirements, assumptions, computational complexity, and the extent/nature of the impacts captured. These variables need to be taken into consideration when planning an economic impact study. Second, the paper discusses additional analysis that needs to be conducted if an accurate assessment of the total economic impact of cooperatives is to be gained.[5]

The paper is structured as follows. The next section contains a critical analysis (general operating principles, advantages, limitations, and best use) of the most common methodologies to measure economic impact. The section following outlines the main methodological challenges that arise when measuring the economic impact of cooperatives and what needs to happen. The final section concludes the paper.

Economic impact methods

The most common methodologies to measure the contribution of a business sector to the local or national economy include: a) the "head-count" approach; b) the input-output analysis; c) the social accounting matrix approach, and d) the computable general equilibrium model. This section contains a critical analysis of each method (i.e., appropriate uses, general operating principles, general advantages and disadvantages). Table 1 summarizes the results of this analysis.

5 The findings from this paper directly inform the National Study on the Impact of Cooperatives (NSIC) in Canada.

Table 1: A taxonomy of economic impact methods

Method	Pros	Cons	Best for…
"Head Count" Approach	Limited amount of information required Computational simplicity	Does not generate multiplier effects nor indirect and induced effects Static measurement	Assessing relative size of a sector
Input-Output (I-O) Model	Relatively limited data requirements Seemingly straightforward application and presentation of results	Limiting assumptions (e.g., input supply is perfectly elastic and infinite, production is linearly homogeneous in inputs and outputs) Static measurement	Calculating direct, indirect and induced effects, as well as multiplier effects in economies where resources are not fully employed
Social Accounting Matrix (SAM) Approach	Estimated impacts are broken down into finely disaggregated industries	Increased data requirements Limiting assumptions (e.g., input supply is perfectly elastic and infinite, production is linearly homogeneous in inputs and outputs) Static measurement	Analyzing distributional aspects of an economic activity
Computable General Equilibrium (CGE) Model	More realistic assumptions – non-linear production functions, considers resource constraints and behavioural responses of producers and consumers with respect to changes in prices, Can incorporate dynamics and endogenous growth	Increased data requirements Computational complexity Loss of detail Results highly sensitive to parameter values that are used initially to calibrate the model	Examining impact of an economic activity over time in an economy characterized by limited resources

"Head-count" approach

The model

The "head-count" approach focuses on assessing the relative size of a sector by simply inventorying the assets held, the amount of capital investment made, the revenues and profits generated, the number of people employed, and the wages, salaries and dividends paid, among other indicators (Deller et al., 2009).

Strengths and limitations

The appeal of this approach consists in the limited amount of information that is required and its computational simplicity. However, it fails to provide a complete measure of economic impact, as it does not capture the "multiplier effect" nor does it produce indirect and induced effects (see below for a definition of these effects). Moreover, it is a static measurement, capturing the impact of a sector at a single point in time.

Input-Output analysis

The model

To briefly review, an Input-Output (I-O) model starts with a transactions matrix that describes, in value terms, the sales and purchases of goods and services between all sectors of the economy for a given period of time.[6] The columns of the matrix represent buying agents in the economy or demand, while the rows represent selling agents or supply. For each economic sector, total sales must be equal to total purchases. An illustrative example is provided in Table 2.

Table 2: Hypothetical transactions matrix

To: From:	Agriculture	Services	Final demand	Total output
Agriculture	25	50	30	105
Services	20	10	170	200
Wages/other payments	60	140	105	305
Total Outlays	105	200	305	610

Algebraic manipulation of the empirical I-O model – i.e., matrix inversion – allows the modeler to determine the economy-wide impacts of changes in the demand for a sector's products. Impacts are measured in terms of the revenue

6 For a more detailed description of I-O model building and theoretical assumptions, see Miller and Blair (1985).

generated by selling the output, the number of jobs created, the wages and benefits paid to employees, the total money spent on other variable inputs, and the payments made to owners (dividends). For instance, consider an increase in the demand for agricultural products (e.g., beef) in the simple economy example outlined above. To meet this new, higher level of demand, beef producers must increase production, which means that they need to purchase additional feed from grain farmers, additional professional services such as veterinarian services, and additional labour. These other sectors must, in turn, increase production and their corresponding inputs to meet the new level of demand. Also, the new labour hired by beef producers has higher levels of income to spend, thus creating even higher levels of demand. That is, the increased production of beef, as a result of increased demand, has a ripple effect – the *multiplier effect* – throughout the economy as a whole.

Apart from multiplier estimates, the I-O analysis also generates estimates for the direct, indirect, and induced effects of the change in economic activity. *Direct effects* are associated with increased production of the sector in question (e.g., in the example above, these are increased sales of beef, number of jobs created in agriculture, increased wages and benefits paid to employees in agriculture). *Indirect effects* measure the changes in inter-industry transactions when supplying industries respond to increased demand from the directly affected industry. *Induced effects* estimate the changes in local spending that result from income changes (wages and dividends) in the directly and indirectly affected industries. Total economic impact is the sum of direct, indirect and induced effects.

Strengths and limitations

The main advantages of the I-O modeling approach are its relatively limited data requirements, and seemingly straightforward application and presentation of results. Also, the widespread use of the I-O model for economic impact measurement strengthens the case for its future use, as it facilitates comparability of results across sectors and countries.[7]

The limitations lie primarily in the approach's underlying assumptions (OECD, 1992; Loveridge, 2004). Principal among these assumptions is that input supply is perfectly elastic and infinite. That is, I-O models assume that resources flow freely to the industry under study and related industries (e.g., supplier industries). These resources are assumed to not be used elsewhere; hence, there is no reduction in

7 The I-O approach has been employed to measure economic impact of the food processing sector (MNP, 2012), universities (Pinfold, 2011), non-profit organizations (Sobolewski, 2010), and public investment (Weisbrod and Reno, 2009), to give just a few examples.

output elsewhere or increase in input prices. To the extent that resources are limited and allocated by markets according to their most efficient use, making resources available for an activity means that other economic activities have fewer resources, and thus their production will fall. Moreover, even with less than full employment of resources, increased output may increase input prices if input quality is not homogeneous or markets are not perfect. By failing to consider these feedback effects, I-O models tend to overestimate economic impact.

The assumption that production is linearly homogeneous in inputs and outputs – that is, the same relative mix of inputs is used to create product regardless of the scale of output or price effects – is also limiting.[8] A related problem is that the approach does not allow for slack in the economy – e.g., under the fixed-coefficients assumption of I-O, firms cannot squeeze extra production from their existing assets and workforce. Finally, another major drawback of the I-O analysis, just as with the head-count approach, is the fact that it is a static measurement.

Social Accounting Matrix approach

The model

Social Accounting Matrix (SAM) models operate with the same basic set of assumptions and solution method (i.e., matrix inversion) as I-O models. However, rather than concentrating on production activities as is the case with I-O models, a SAM model describes the structure of an economy in terms of the links between production, income distribution, consumption of goods and services, savings and investment, and trade (Thorbecke, 1998). Thus, a SAM is a more comprehensive database than the transactions matrix of an I-O model. The transactions recorded in a SAM are not limited to the purchase or selling of goods and services (as in an I-O model) but can incorporate any type of transaction. This includes transactions that take place during the production process such as the purchasing of intermediate goods and hiring of factors. It also includes current account transactions of institutions (households, businesses and government) such as inter-institutional transfers and the payment of various taxes. It further includes capital account transactions of institutions, such as savings and investments. Finally, it can include any transaction that takes place across international borders, such as foreign direct investment and international trade transactions.

8 Standard economics generally assumes non-linear production functions such as Cobb-Douglas or constant elasticity of substitution.

Strengths and limitations

The main feature of SAM is its attention to distributional aspects – e.g., the estimated impacts in a SAM model are broken down into finely disaggregated industries. Thus, SAM models are better suited when special consideration is given to economic development, as opposed to simple economic growth. The approach has been used mainly by academics – see, for instance, Wagner (1997) for an analysis of the economic impact of tourism.

Since it operates with the same basic set of assumptions as I-O models, the SAM method can be criticized on many of the same grounds as I-O. That is, the SAM approach also employs fixed proportion production functions, is static, and does not consider the behavioural responses of producers and consumers with respect to changes in prices.

Computable General Equilibrium model

The model

The Computable General Equilibrium (CGE) approach not only accounts for inter-sectoral linkages, but also models markets for goods and services and factor markets, recognizes resource limitations, models consumer spending, and allows for government spending and taxing (Harrison et al., 2000). Also, production is modeled with standard economics non-linear production functions.

Specifically, in a CGE model, each transaction flow in the SAM table is disaggregated into two components – price and quantity – which are allowed to adjust in response to the increase in the economic activity of the sector under study. Technically, a CGE model consists of a system of (a) simultaneous equations – i.e., supply and demand equations describing the behavior of economic agents, and (b) macroeconomic constraints – i.e., macroeconomic aggregates and balances, such as investments and savings, balance of payments, etc. CGE models can be static (i.e., no time dimension) or dynamic (i.e., explicitly consider time and time-related adjustments), and are solved using equilibrium computation – i.e., equilibrium is reached when a vector of prices is found that "clears" all the markets, while satisfying all the macroeconomic constraints. A typical CGE model will give a measure of the overall change in economic output through the effect on GDP, while also providing output results for individual industries. The impact on key variables such as employment or government revenue will also be part of the model's output.

Strengths and limitations

CGE models have been used mainly by academics (e.g., Taylor et al., 1999; Seung and Kraybill, 2001). The obvious advantage of the CGE model are the more realistic assumptions it is built on – it represents the whole economy, and considers

resource constraints and behavioural responses of producers and consumers with respect to changes in prices. Also, dynamics and endogenous growth can be readily incorporated into CGE models.

However, to keep the problem tractable, CGE models tend to include fewer sectors, so loss of sector detail is a principal disadvantage. Also, the results of CGE models are highly sensitive to parameter values that are used initially to calibrate the model. Having said that, the CGE analysis allows for testing of the sensitivity of results to different assumptions such as assumptions about consumer behaviour (Dwyer et al., 2000) or labour markets (Dwyer and Forsyth, 1998).

Limitations of economic impact methods in measuring cooperative impact

Limitations of the Input-Output model

The tradeoff between data requirements and computational complexity, and how well the model reflects the reality have made the I-O model the most common tool for economic impact analysis in general, but also for measurement of the economic impact of cooperatives (see Table 3). It is important to note though that I-O has additional limitations when it comes to measuring the economic impact of cooperatives.

A key limitation when using I-O to measure the contribution of cooperatives to the local economy is the inability to account for the unique relationship cooperatives have with the local economy (Zeuli and Deller, 2007). Specifically, within the standard I-O tables, the multipliers are assumed to be the same for all business structures within a single industrial sector or North American Industry Classification System (NAICS) code. However, cooperative theory suggests that cooperatives are likely to purchase more of their inputs locally than other types of firms within the same industry classification (Fulton and Ketilson, 1992; Fairbairn et al., 1995). Since cooperative owners are also community residents, they may support the purchase of local inputs (even if they are more expensive) because they will benefit from the long-term positive economic and social impacts that local businesses have on their community. Also, there is empirical evidence that cooperatives have competitive advantages at sourcing locally relative to other business structures (e.g., Enlow, Katchova, and Woods, 2011; Katchova and Woods, 2011). When undertaking an economic impact study of the cooperative sector, a survey of purchasing patterns needs to be conducted to test the hypothesis that cooperatives purchase more locally than comparable firms with other business

structures.[9] If spending patterns differ among business structures, the I-O estimates are going to be biased. To get unbiased estimates, economic sectors based on NAICS codes will need to be further refined according to business structure (i.e., cooperative vs. non-cooperative) and new multipliers will need to be calculated for the cooperative businesses.

Table 3: Review of economic impact studies of cooperatives

Method	Author, year of publication	Scope of the study
"Head-Count" Approach	Fulton et al., 1991	Various sectors, Saskatchewan
	Ketilson et al., 1998	Various sectors, Saskatchewan
	Herman and Fulton, 2001	Various sectors, Saskatchewan
	National Cooperative Business Association, 2005	Various sectors, U.S.
	Coop FR - les entreprises cooperatives, 2012, 2014	Various sectors, France
	Cooperatives UK, 2007-2014	Various sectors, U.K.
Input-Output (I-O) Model	Bhuyan and Leistritz, 1996	Various sectors, North Dakota
	Bangsund and Leistritz, 1998	Sugar beet industry, North Dakota and Minnesota
	Bhuyan and Leistritz, 2000	Non-agricultural sectors, North Dakota
	McNamara et al., 2001	Agriculture, Great Plains and Eastern Cornbelt
	Coon and Leistritz, 2001	Various sectors, North Dakota
	Folsom, 2003	Various sectors, Minnesota
	Coon and Leistritz, 2005	Various sectors, North Dakota
	Deller et al., 2009	Various sectors, U.S.
	Leclerc, 2010	Various sectors, New Brunswick
	McKee, 2011	Various sectors, North Dakota
	Frick et al., 2012	Various sectors, Montana
	Karaphillis, 2012	Various sectors, Nova Scotia
Social Accounting Matrix (SAM) Approach	Zeuli et al., 2003	Various sectors, Wisconsin
Computable General Equilibrium (CGE) Model	N.A.	

9 Empirical evidence from the U.S. on purchasing patterns of food cooperatives and conventional retailers supports this hypothesis (The ICA Group, 2012).

Also, the I-O model has limitations when it comes to analyzing the impact of patronage refunds (Zeuli and Deller, 2007). Cooperatives mainly use patronage refunds to share net profits with their members, a different mechanism from the dividends used by investor-owned firms. However, the national firm surveys used to update the national I-O tables ask for information about dividends, but not patronage refunds. Since patronage refunds are not exactly the same as dividends, these surveys do not provide accurate data on patronage refunds. Also, once the data is aggregated, the significance of patronage refunds gets lost, especially in those sectors where cooperatives represent a small share of the total firm population. If patronage refunds are not properly accounted for, the local economic impact of cooperatives is underestimated – that is, the value-added estimate for local economies is likely much higher for patronage refunds than dividends since cooperatives tend to be locally owned unlike for-profit firms whose owners are generally spread across the country or internationally. Moreover, even when ownership of for-profit firms is local, it tends to be concentrated in the hands of a few people (e.g., family-owned businesses), unlike cooperatives which are owned by many people.

Even if patronage refund data is collected, there is also the question of how to analyze it. Total income within an I-O framework comprises personal income and property income, and dividends are included in property income. However, as Folsom (2003) notes, treating patronage refunds as property income is incorrect since they are subject to different corporate level taxation rates than dividends. Moreover, the assumption of the I-O model that some revenue leaks out of the region (to reflect returns to non-local investors) might also be inappropriate, as all of a cooperative's patronage refunds may be returned locally (Folsom (2003) and Baros (2009) assume that 100% of spending stays local). In response to the patronage refund issue, Folsom (2003) chose to consider patronage refunds as part of personal income. In Zeuli et al. (2003), patronage refunds were treated as a separate shock to final demand, thereby creating their own set of impacts (in terms of total income and tax revenues). Finally, Bangsund and Leistritz (1998) treated patronage refunds as household income.

Limitations of all economic impact methods

It is important to recognize that all methods reviewed in the previous section measure strictly the economic impact of cooperatives when viewed just like other business structures and cannot assess the unique value of cooperatives for their members, be they individuals or firms (by design, cooperatives exist to create economic value to members). For instance, a producer-owned marketing cooperative creates what McKee et al. (2006) call "extra-cooperative" value – benefits that accrue to the community, stakeholders, non-members or the general

public, such as tax payments, employment opportunities, or non-member services. This is what the methods reviewed in the previous section focus on. However, this same cooperative also generates "intra-cooperative" value that is captured primarily by members, such as improved prices for products or terms of trade, access to markets not otherwise reached, valued member services, valued information, and technology adoption. Moreover, by presenting a 'snapshot picture' of the economy, most of the methods (the dynamic CGE model being the exception) fail to consider the contribution of cooperatives to the long-term growth and resilience of the communities in which they operate - perhaps the most important measure of their economic impact.

Previous studies (e.g., Fulton and Ketilson, 1992; Zeuli et al., 2003; McKee, 2011; The ICA Group, 2012) have at best included a discussion of these economic impacts unique to cooperatives (one exception is the study by London Economics (2008), which assessed the impact of cooperative groups on various aspects of competitiveness of their crafts and small enterprise members across the European Union, including increased sales and access to markets, decreased costs and increased profits). Failure to quantify them understates the economic impact of the cooperative sector at regional level, with this understatement even larger if omitted at the national level. The rest of this section discusses additional analyses that need to be completed if a more accurate assessment of the total value created by cooperatives is to be gained.

Countervailing market power

It has long been argued in the industrial organization literature that cooperatives have a pro-competitive role in imperfectly competitive markets (e.g., Nourse, [1922] 1992; Helmberger, 1964; Sexton, 1990; Innes and Sexton, 1994). Specifically, the *yardstick of competition hypothesis* (Nourse, [1922] 1992) contends that cooperatives provide "extra competition" that forces investor-owned firms (IOFs) operating in monopoly/ oligopoly and monopsony/ oligopsony markets to increase their purchasing prices (in the former case) or lower their selling prices (in the latter case). Very often, cooperatives have been formed to counterbalance the power of IOFs. For example, farm marketing cooperatives, such as the grain elevator cooperatives in western Canada at the beginning of the 20th century (Fowke, 1957) and, more recently, coffee processing and marketing cooperatives in Mexico (Milford, 2004) were formed when the middlemen who purchased farm products had monopsony/ oligopsony power over farmers. Many farm supply cooperatives, which supply member farmers with inputs such as fertilizer, petroleum, feed and seeds, were established in the U.S. during the two decades after World War I when IOFs had monopoly power over farmers (Hansmann, 1996).

IOFs, as the name suggests, are owned by shareholders, who may or may not use the goods or services it provides. Thus, an IOF is primarily concerned with the maximization of profits to shareholders and ignores any impact its pricing has on the welfare of people who use its goods or services. In contrast, cooperatives are owned by the people who do business with the organization. As a result, a cooperative will not only be interested in how much profit the organization makes, but it will also be concerned with the effect the price it charges has on members' welfare. By internalizing the pricing decision, the cooperative will accept lower profits, and will offer a higher price than a monopsony/oligopsony IOF is ready to pay or charge a lower price than a monopoly/oligopoly IOF is willing to accept.[10]

Although it seems to be a generally accepted view that cooperatives have a pro-competitive effect on the market, there is very little empirical research that has examined the existence and magnitude of this effect. Moreover, the evidence is mixed. Fulton (1989), in an analysis of the fertilizer industry in western Canada, showed that cooperatives may fail to fulfill their pro-competitive role for various reasons, including barriers to entry by an incumbent IOF. Hoffman and Royer (1997) used simulation analysis to show that the yardstick effect is not universal, but instead is sensitive to market structure and the behaviour of cooperative members. In contrast, empirical evidence by Rogers and Petraglia (1994) and Zhang et al. (2007) supports the yardstick hypothesis. Finally, authors such as Peterson and Anderson (1996) and Milford (2004) find qualitative evidence from interviews that cooperatives have a pro-competitive effect; however, they agree that the interviewees' responses alone do not represent objective evidence.

Accounting for the pro-competitive effect of cooperatives requires 1) confirming its existence and 2) measuring the influence it has had on member returns – i.e., the additional revenue or savings they received from cooperative membership. This involves estimating the prices members would have received/paid in the absence of the cooperative and comparing them to the actual prices. For instance, for producer-members of local food cooperatives, we would need to measure the difference between the prices they receive for their products when they sell through the cooperative and the prices we would expect them to receive had they never established cooperatives. Non-members will also benefit from more competitive prices as a result of the cooperative's presence on the market – hence, their extra-revenues/savings also will need to be calculated. The extra-revenues/savings will constitute the direct impact and the I-O multipliers can be used to estimate the secondary and total impacts associated with the pro-competitive effect of cooperatives.

10 For formal proofs of these arguments, see, for instance, Helmberger (1964), Sexton (1990), and Fulton and Giannakas (2001).

Missing goods and services

When conducting an economic impact analysis of the cooperative sector, it is also important to account for the value of the goods and services that cooperatives provide that would otherwise go missing in their local communities. Studies such as Fulton and Ketilson (1992) for Canada and Bhuyan and Leistritz (2000) for the U.S. provide evidence of cooperative businesses that were formed because for-profit firms were unable or unwilling to provide the goods and services. Fulton and Ketilson (1992) show formally why it may make economic sense for a cooperative, but not for a profit-oriented firm, to operate in small local markets that do not allow for competitive rate of returns. This is due to the fact that the benefits to consumers from being able to purchase locally are greater than the business costs of supplying the good or service. Since, in cooperatives (unlike IOFs), these costs and benefits are incurred by the same group of people – the members – cooperatives will continue to operate in markets where IOFs would not find it advantageous to do so.

Research analyzing the economic impact of cooperatives needs to 1) establish whether existing cooperatives were created in reaction to either a for-profit firm leaving the community or a community need that was not being met by other businesses, and 2) measure the extra-benefit to cooperative members of providing those goods and services locally (this will be determined by the difference between a) the price charged by the local cooperative and the convenience of having access to basic needs nearby, and b) the price charged by for-profit firms operating in more central locations, the cost of commuting to those locations, and the opportunity cost of time). The extra-benefit will constitute the direct impact and the I-O multipliers can be used to estimate the secondary and total impacts associated with the extra-benefit of the cooperative providing goods and services in local communities that otherwise would not be provided.

Local economic stability

By the nature of their mission to serve members, cooperatives tend to be ‘anchored’ to the areas where members are located (Fairbairn et al., 1995). This necessity to remain in proximity to members makes it less likely for cooperatives to relocate to places that might have cheaper raw products or labour, as is the case with IOFs. A related argument for the contribution of cooperatives to local economic stability is the belief that cooperatives have significantly higher survival rates than IOFs. A number of studies (Murray, 2011; Stringham and Lee, 2011; Quebec Ministry of Industry and Commerce, 2000; Quebec Ministry of Economic Development, Innovation and Export, 2008) provide empirical data that supports this theory. Finally, cooperatives can also play a role in attracting and retaining

additional economic activity (other cooperatives or for-profit firms) in a local area via, for instance, a healthy industry (Zeuli and Deller, 2007).

The contribution of cooperatives to local economic stability or long-term growth and resilience is perhaps the most important measure of their economic impact. Yet, most of the methods reviewed in the previous section (dynamic CGE model being the exception) present a 'snapshot picture' of the economy, capturing the impact of cooperatives at a single point in time. To gauge the total effect of cooperatives on community resiliency, one could compare economic indicators from a set of similar communities that differ only in the number and/or strength of cooperatives over a long-enough period of time. Alternatively, one could analyze the ability of a group of comparable communities (again allowing for differences in cooperation) to adjust to a similar local economic crisis (e.g., the loss of a major employer or industry) or to the recent global economic crisis.

Concluding discussion

There is an increasing interest in measuring the economic impact of cooperatives and in unearthing the most appropriate method to be used. The objective of this paper was to conduct a critical analysis of the methodologies that have been used to measure the economic impact of a business sector, in general, and the cooperative sector, in particular. The tradeoff between data requirements and computational complexity, and how well the model reflects the reality have made the Input-Output model the most common tool for economic impact analysis in general, but also for measurement of the economic impact of cooperatives. However, several methodological issues, discussed in the paper, need to be addressed when using Input-Output to measure the economic impact of cooperatives.

Another key finding is that all methods measure strictly the economic impact of cooperatives when viewed just like other business structures and cannot assess the unique value of cooperatives for their members and their communities, such as countervailing market power and missing goods and services. Moreover, by presenting a 'snapshot picture' of the economy, most of the methods fail to consider the contribution of cooperatives to the long-term growth and resilience of the communities they operate in - perhaps the most important measure of their economic impact. Therefore, additional analysis needs be conducted if an accurate assessment of the total contribution cooperatives make to their communities is to be gained.

The scope for further research in this field is immense. Future research on economic impact methodologies for the cooperative sector could examine how to best capture the fact that cooperatives purchase more locally compared to investor

owned firms and how to work with patronage refunds. But most importantly, there is an opportunity to expand existing impact methodologies to capture the impact of countervailing market power, missing goods and services, and contribution to local economic stability, in order to grasp the widest possible and actual economic impact of cooperatives.

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