The determinants of co-operative employment: effects of total employment and added value

The Italian example

Ivana Catturani / Millán Díaz-Foncea

Overview

Introduction

Cooperative employment and Economic dynamic

Variables of Study

Methodology

Results

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Introduction

Cooperatives are significant in employment

- 26.4 million workers exist in cooperatives, as much employees (15.6 million) as worker-members (10.8 million)   [Roelants et al., 2014]

- In the European Union (EU), these organizations account for more than 4.5 million paid jobs, more than 2% of the employment generated in the EU   [Chaves and Monzón, 2012]

Different approaches exist that explain economic cycle influences the development of cooperatives: positive, *push effect* or no relationship.

Introduction

Cooperative firms are…

enterprises that share the following characteristics (Jones and Kalmi, 2009):

1) Ownership is not determined solely by investment in shares; the owners also have a relationship with the enterprise as employees, suppliers, or customers;

2) Voting rights are not related to the capital provided, but shared equally amongst members

These organizational characteristics cause differences in economic behaviour and in the relationship at macro-economic level.

Introduction

<u>Objectives: Understand the role of cooperatives during the economic cycle</u>

1. To analyse the relationship between the evolution of employment created by cooperatives and the economic dynamic.

2. To compare this relationship with the effect of employment in capitalist firms.

Introduction

Research strengthes

1. Focus on a country with a great cooperativist tradition
   (employees in cooperatives in Italy was 1.13 million in 2010, the 25% of cooperative employment in all EU-27).

2. Study the provincial level
   (greater impact than in other superior levels where the effect is hidden).

3. Application of new methodologies (causality test with panel data) and new type of variables (growth rate).
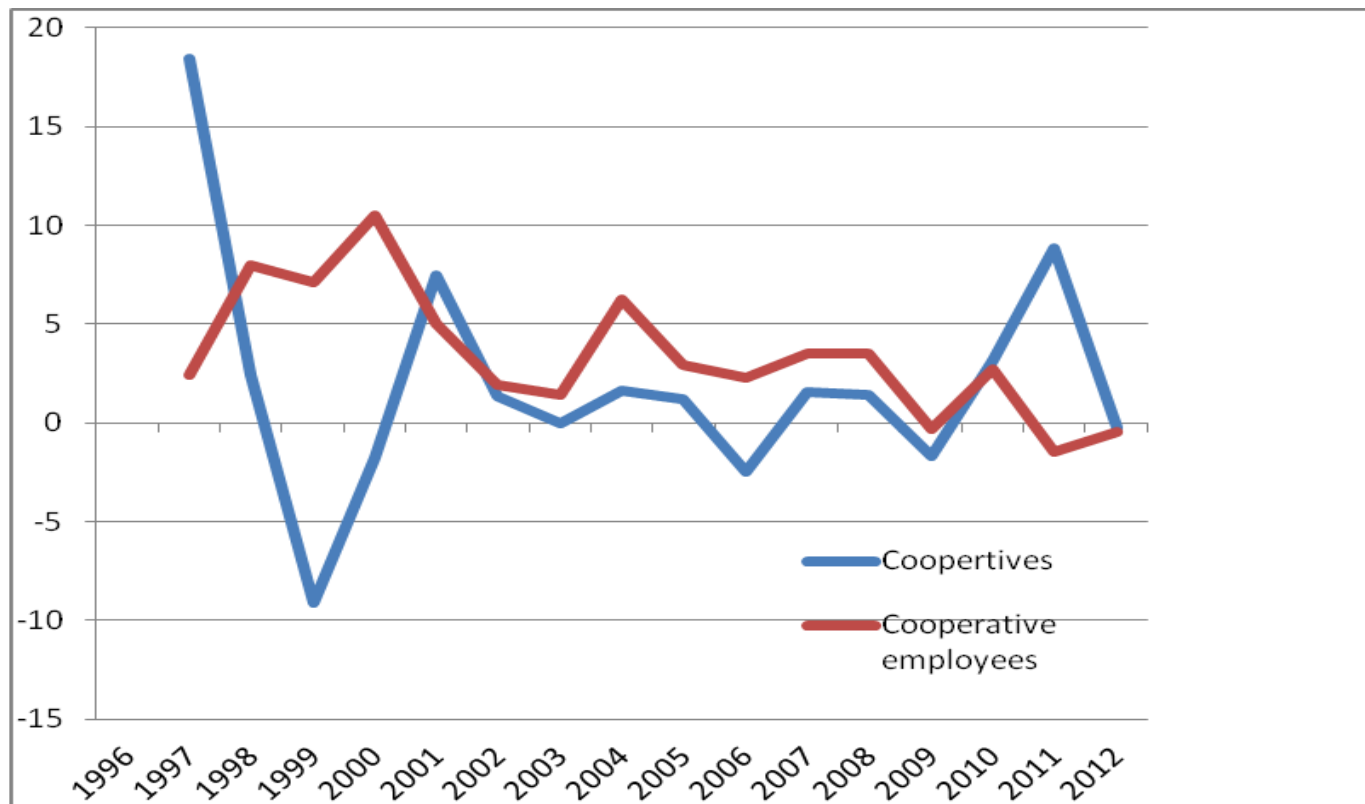
Descriptive Analysis

Figure 1. Cooperatives and their employees in Italy (1996-2012)
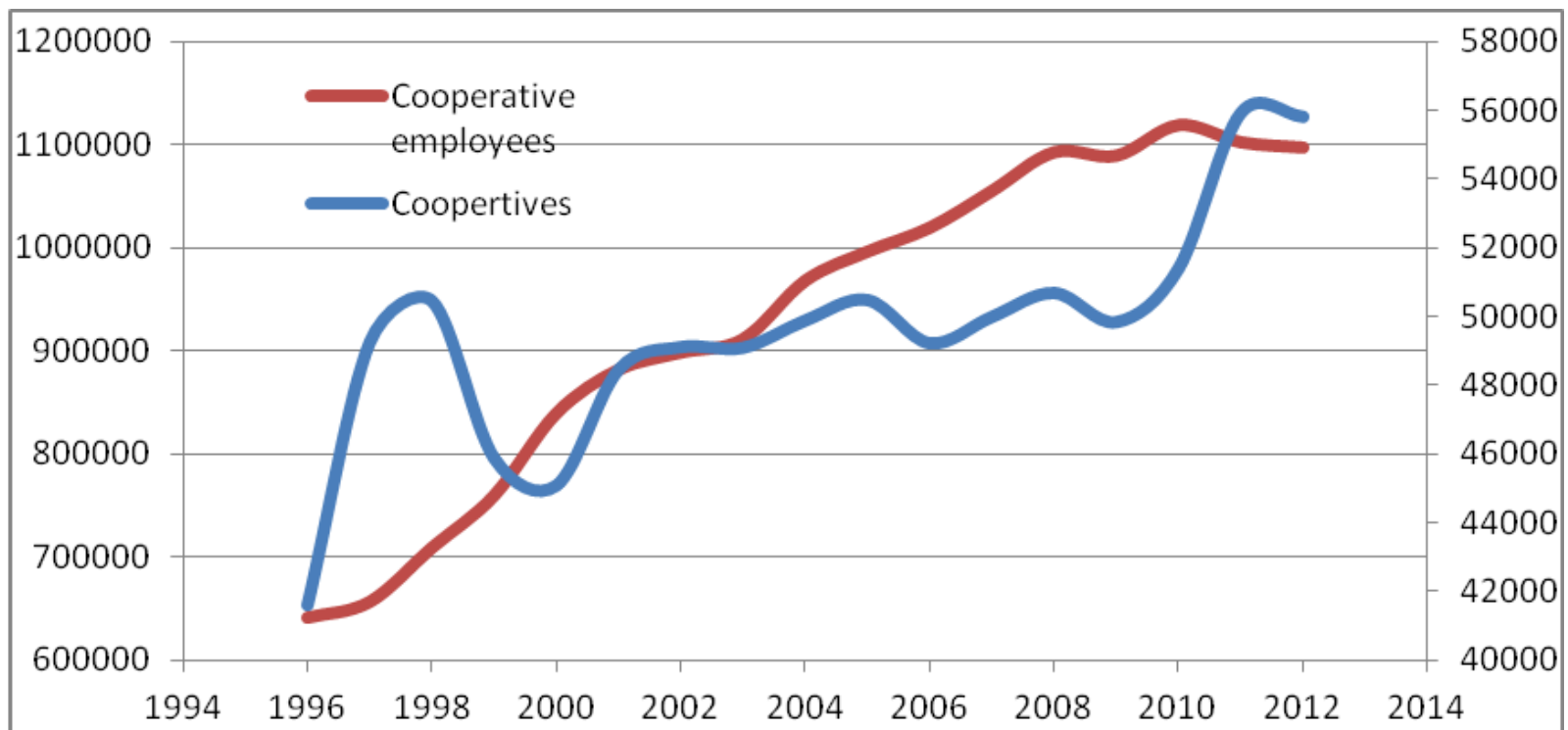
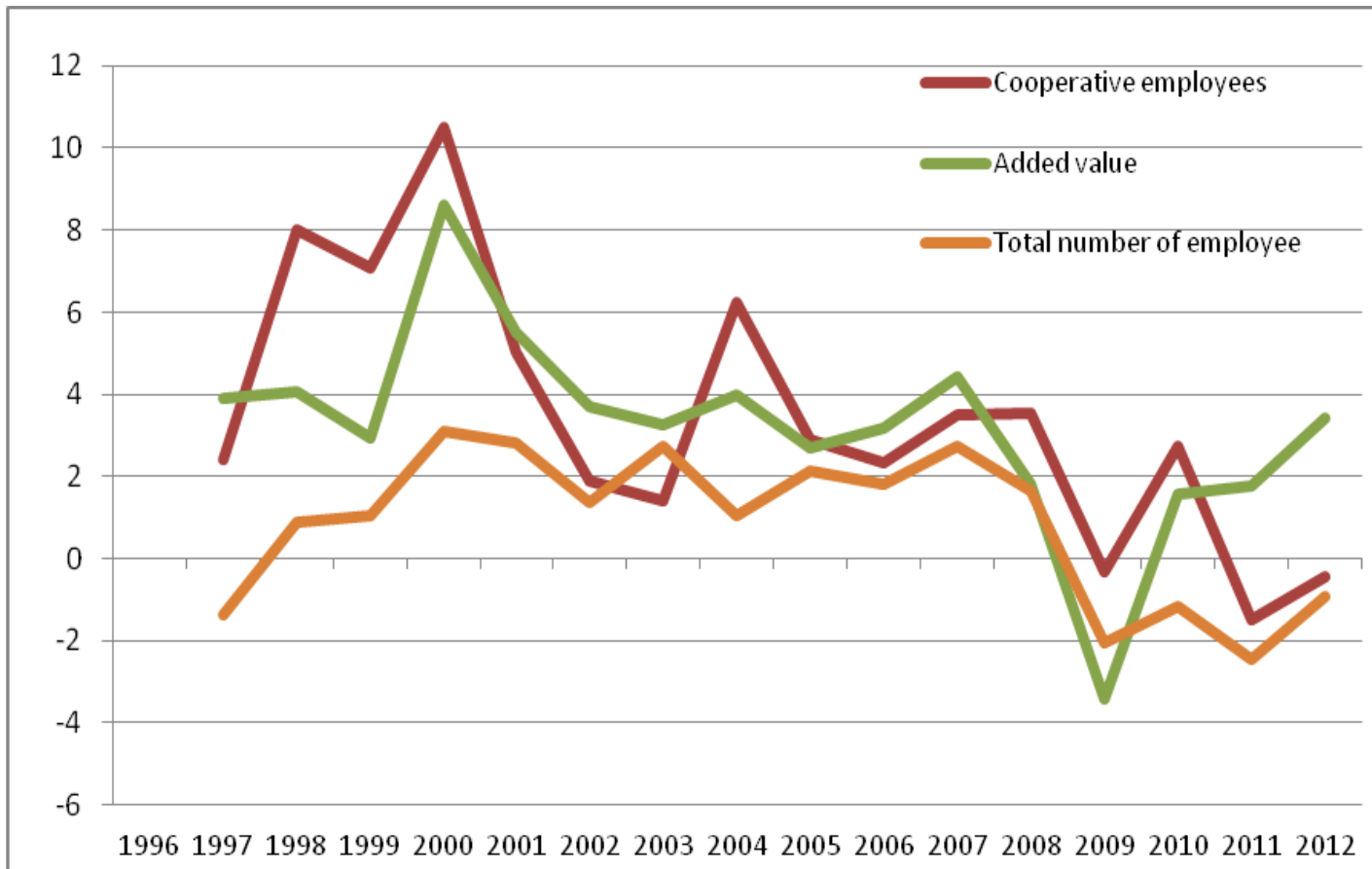Source: Istat 2015

Descriptive Analysis

Figure 2. A comparison between the growth rate of cooperatives and of cooperative employees (yearly variation, 1996-2012)

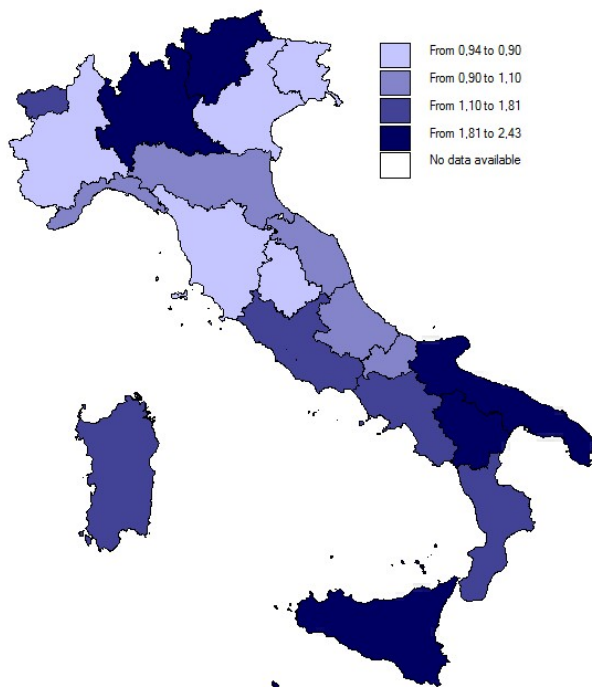Source: Istat 2015

Descriptive Analysis

Figure 4. A comparison among rates of growth (% of previous year)
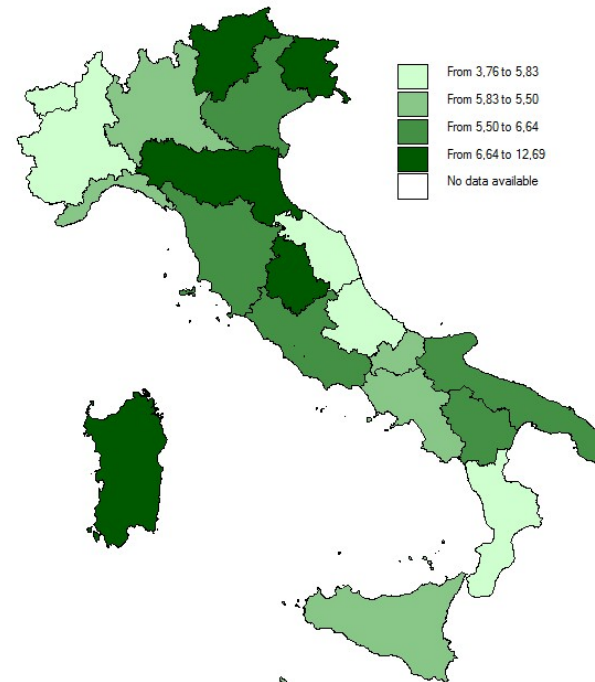

Source: Istat 2015

Descriptive Analysis

▸ Relative importance of cooperatives per region in 2012

▸ Relative importance of cooperative employees per region in 2012

From 0,94 to 0,90
From 0,90 to 1,10
From 1,10 to 1,81
From 1,81 to 2,43
No data available

From 3,76 to 5,83
From 5,83 to 5,50
From 5,50 to 6,64
From 6,64 to 12,69
No data available

Source: Istat 2015

Methodology

Data

Data comes from Italian Statistical Institute (ISTAT).

103 Italian provinces*
17 years (1996 – 2012)

Variables: growth rate

tw_coop refers to growth rate of cooperative employment.
tw_cf is related to growth rate of capitalist firm's employment.
tw_tot refers to growth rate of total employment (cooperative, capitalist firms, self-employment, associations, other...).
taddval is related to growth rate of added value per capita.

* We remain grouped provinces with new administrative status since 2004 and 2008.

Methodology

Model of Estimation

Granger Causality Test (1969) in panel data

GCT based on the idea that the cause cannot appear after the effect, i.e. future values of a variable are conditioned by past values of a variable , helping to predict more accurately the development of variables

$$Y_t = \sum_{i=1}^{mlag} -\pi_{11}Y_{t-i} + \sum_{i=1}^{mlag} -\pi_{12}X_{t-i} + a_t \qquad (1)$$

$$X_t = \sum_{i=1}^{mlag} -\pi_{21}X_{t-i} + \sum_{i=1}^{mlag} -\pi_{22}Y_{t-i} + b_t \qquad (2)$$

where X and Y are the two analyzed variables which evolve along *t*, *a* and *b* are random disturbance.

Methodology

Model of Estimation

Granger Causality Test (1969)
in panel data

SUR systems:
- contemporaneous corr. is very likely between equations for provinces (B-P test).

- n. of lags (AIC / BIC) – 1 to 4 lags

Extensions:
- Toda and Yamamoto (1995) - adjusting the estimation, extended lags.

- Granger Causality Test by macro-regions - testing in different institutional contexts (Dow, 2003).

Methodology

Model of Estimation

SUR model

X > Y	(3) X ≠ 0
	(4) Y = 0
Y < X	(3) X = 0
	(4) Y ≠ 0
X <> Y	(3) X ≠ 0
	(4) Y ≠ 0
X ≠ Y	(3) X = 0
	(4) Y = 0

$$Y_{1,t} = \sum_{l=1}^{mlag_{y1}} \beta_{1,1}\, Y_{1,t-l} + \sum_{l=1}^{mlag_{x1}} -\pi_{1,1}\, X_{1,t-l} + a_{1,1}$$

$$Y_{2,t} = \sum_{l=1}^{mlag_{y1}} \beta_{1,2}\, Y_{2,t-l} + \sum_{l=1}^{mlag_{x1}} -\pi_{1,2}\, X_{2,t-l} + a_{1,2} \qquad (3)$$

$$\ldots$$

$$Y_{N,t} = \sum_{l=1}^{mlag_{y1}} \beta_{1,N}\, Y_{N,t-l} + \sum_{l=1}^{mlag_{x1}} -\pi_{1,N}\, X_{N,t-l} + a_{1,N}$$

and

$$X_{1,t} = \sum_{l=1}^{mlag_{y2}} \beta_{2,1}\, Y_{1,t-l} + \sum_{l=1}^{mlag_{x2}} -\pi_{2,1}\, X_{1,t-l} + b_{2,1}$$

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Results

Table 1. Granger Causality Test

Cause	Effect	Chi-Square	Lags	Coef. Effect	Causality direction
tw_coop	tw_tot	4,84**	1	0,1860	tw_tot > tw_coop
tw_tot	tw_coop	0,11	1	0,0025	
tw_cf	tw_tot	16,22***	1	0,3278	tw_tot <> tw_cf
tw_tot	tw_cf	15,69***	1	0,0965	
tw_coop	taddval	5,27**	1	0,1582	taddval <> tw_coop
taddval	tw_coop	4,43**	1	0,0202	
tw_cf	taddval	40,44**	1	0,2428	taddval > tw_cf
taddval	tw_cf	0,09	1	0,0053	

Notes: (1) *tw_coop* refers to growth rate of cooperative employment; *tw_cf* is related to growth rate of capitalist firm's employment; *tw_tot* refers to growth rate of total employment (cooperative, capitalist firms, self-employment, other...); *taddval* is related to growth rate of added value. (2) *** and ** indicate significance at the 10% and 5% levels, respectively. (3) Number of lags selected upon AIC criterion.

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Table 2. Granger Causality Test - adjusted by Toda y Yamamoto (1995)

Cause	Effect	Chi-Square	Lags	s/t	l/t	Causality direction
tw_coop	tw_tot	28,17***	1 (3)	**0,3450**	**0,4076**	
tw_tot	tw_coop	12,26***	1 (3)	**0,0106**	**0,0374**	tw_tot < > tw_coop
tw_cf	tw_tot	29,10***	1 (3)	**0,2076**	**0,2707**	
tw_tot	tw_cf	35,06***	1 (3)	**0,1453**	**0,1742**	tw_tot < > tw_cf
tw_coop	taddval	29,91***	1 (3)	**0,1648**	**0,6260**	
taddval	tw_coop	15,44***	1 (3)	**0,0369**	**0,4133**	taddval < > tw_coop
tw_cf	taddval	130,54***	1 (3)	**0,2911**	**0,7554**	
taddval	tw_cf	6,00	1 (3)	**0,0331**	**-0,0276**	taddval > tw_cf

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Results

Table 3. Granger Causality Test - by macro-region

Cause	Effect	North-West 29%	North-East 32%	Centre 21%	South 12%	Islands 6%
tw_coop	tw_tot	1,44	0,07	0,47	5,68**	1,23
tw_tot	tw_coop	0,06	0,61	0,00	2,29	1,97
causality direction		No	No	No	tw_tot > tw_coop	No
tw_cf	tw_tot	3,99**	0,02	5,74**	9,91***	2,26
tw_tot	tw_cf	0,17	8,97***	0,03	0,11	5,09**
causality direction		tw_tot > tw_cf	tw_tot < tw_cf	tw_tot > tw_cf	tw_tot > tw_cf	tw_tot < tw_cf
tw_coop	taddval	1,14	0,29	0,10	8,44***	4,39**
taddval	tw_coop	0,37	1,55	1,62	2,60	0,11
causality direction		No	No	No	taddval > tw_coop	taddval > tw_coop
tw_cf	taddval	1,46	9,63***	16,91***	18,37***	5,80**
taddval	tw_cf	1,62	0,02	0,94	0,07	0,82
causality direction		No	taddval > tw_cf	taddval > tw_cf	taddval > tw_cf	taddval > tw_cf

Notes: (1) Wald Test coeficiente of Effect variable in Granger Causality Test. (2) *tw_coop* refers to growth rate of cooperative employment; *tw_cf* is related to growth rate of capitalist firm's employment; *tw_tot* refers to growth rate of total employment (cooperative, capitalist firms, self-employment, other...); *taddval* is related to growth rate of added value. (3) ***, ** and * indicate significance at the 1%, 5% and 10% levels, respectively. (4) Number of lags selected upon AIC criterion = 1 in all cases.

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Conclusions

1. Business dynamic and the evolution of cooperative employment is related, and when significant, it is positive-related.

2. Cooperative employment is more related to total employment // Added value is more related to employment in capitalist firms.

3. The link of business dynamic with employment in capitalist firm is stronger than with emp. in cooperatives (coefficients).

4. The effect of the added value is more important in the long term than evolution of employment.

5. In regions with more cooperators, are not relationship between variables.

Limitations & Further Research

1. More research is needed to resolve the limitations of this research.

    1. To improve the Granger Causality specification [bootstrap re-sample of residuals]
    2. To search other methodologies for measuring the causality relationship .
    3. To research more about institutional influence.
    4. To check cross-border influence between regions.

2. When more data available, we can test the effect before/after crisis (1996-2007 / 2008-2012)

3. Determinants of the size of cooperative sector by province-region.

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