

Article

# Business Cycle, SSE Policy, and Cooperatives: The Case of Ecuador

Inmaculada Buendía-Martínez <sup>1,\*</sup> , Agustín Álvarez-Herranz <sup>1</sup>  and Mercedes Moreira Menéndez <sup>2</sup> 

<sup>1</sup> Faculty of Social Sciences, University of Castilla-La Mancha, 16071 Cuenca, Spain; agustin.alvarez@uclm.es

<sup>2</sup> Faculty of Engineering Sciences, Quevedo State Technical University, Quevedo 120301, Ecuador; mmoreira@uteq.edu.ec

\* Correspondence: inmaculada.buendia@uclm.es

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**Abstract:** Over the last few decades, the social and solidarity economy (SSE) has undergone complex changes, from being undervalued to being institutionalized as a key sector in the economy. Within this context of change, Ecuador is a remarkable example of a country that has revamped its public policy to situate the SSE in a position of prominence on the national landscape. Using the business cycle theory and based on a model of panel data from 2007–2017, this article attempts to empirically validate that the relationship between the size of Ecuadorian cooperatives, as core businesses of SSE, is coupled with the expansive and destructive economic cycles by adding two more variables: business structure and public policy. From a global perspective, the results confirm a procyclical of the behavior of cooperatives and the positive impact of the new public policy. However, the sectoral and territorial analysis concludes that only production cooperatives in the primary sector have grown in the new institutional framework, and that this growth is concentrated in provinces with a strong cooperative tradition.

**Keywords:** public policy; social and solidarity economy; cooperatives; legal framework; cooperative development; institutionalization; social economy; cooperativism; business cycle

## 1. Introduction

After three decades of research, there is no doubt of the impact that entrepreneurship and small businesses have on economic growth [1–3]. However, it was not until the second half of the new millennium that entrepreneurship and small businesses changed their relevance, going from being a marginal aspect in economic literature to being considered a key driver of economic growth together with physical, human, and knowledge capital [4]. This situation has led all levels of government to implement new public policies to foster the entrepreneurial economy as the main objective [5].

Public policies focused on small businesses and entrepreneurship are under construction. The multidimensional nature of entrepreneurship requires an interdisciplinary approach for public policy that leads to the understanding of the variations of the level of entrepreneurial activity across countries and regions over time [6,7]. In any case, there is unanimity among policymakers and scholars on the singularity of the public policy: the aim is to increase entrepreneurial activity through the creation of an enabling environment [5,8,9].

The first economic crisis of this century has confirmed the procyclical behavior of business activity [10–13], although not for all business forms. Organizations belonging to the social and solidarity economy (SSE) have shown greater resilience, demonstrating superior strength and flexibility compared to other forms of business, not only to maintain and create quality employment, but also to reinforce economic, social, and regional cohesion [14,15]. This situation has led to the resurgence

of these organizations, although SSE is not a new phenomenon. SSE has a long tradition all over the world; however, it is only economic crises that bring it to light as a consequence of its specificities based on cooperation, solidarity, and mutuality values [16–18] and their positive effects on employment and market dynamic, increasing entrepreneurial diversity, as well as building a more democratic and inclusive society [19,20].

From an empirical perspective, the position of the literature is ambiguous on the behavior of SSE at different stages of business cycles. Some authors demonstrate its countercyclical movement [20–26], while others offer empirical evidence on their procyclical tendency in the same manner as the other business forms [27–30]. Despite these conflicting positions, all studies have three aspects in common: they exclusively study labor-managed SSE and, therefore, the impact of business cycles is measured in terms of employment; the approach is national without considering the regional effects; and the cases are countries belonging to the high-income group.

This differential behavior has put the SSE in the spotlight of policymakers, producing a wave of public policies at national, regional, and local levels [19,20,31–35] with the aim of supporting the development of these organizations. The depth, amplitude, and focus differ considerably from one territory to another due to the institutional capacity and the contextual differences. Among the variety of public policies applied to the SSE around the world, the Ecuador case has received special attention as a result of the approach used [36–39]. The reformulation of the Ecuadorian SSE has used a global approach, taking “into account a more comprising, integral and as a whole vision of the SSE phenomenon, at legislative and institutional level as well as at public policies design and implantation level” [40] p. 148. This new framework aims to be an enhancement of the SSE to increase the economic and social development of the country.

On this basis, this article aims to advance knowledge by enlarging the empirical research on business cycles and entrepreneurship by analyzing SSE enterprises. Using the business cycle theory and based on a model of panel data from 2007–2017, we study whether the dimension of Ecuadorian cooperative movement, as a core business of SSE, is coupled with the expansive and destructive economic cycles from a global and sectoral level. In addition to increasing the range of methodologies in this area, which are under-developed according to some authors, the analysis adds three contributions that are not considered in the studies on cooperative and business cycles in the past: namely, the case study is for a developing country; it extends the analysis to all cooperative typologies, not only labor ones; and it includes the SSE public policy as a variable. For that purpose, the document is organized into five sections. The section that follows this introduction, the second section, is devoted to reviewing the economic literature about public policies for the SSE and the characteristics of the Ecuadorian case, which will allow us to pose the hypothesis on which the empirical work is based. The third section describes the data and the methodology used. The fourth section presents and discusses the results. Lastly, the final section gives conclusions.

## 2. Literature Review

The 2008 financial crisis and its subsequent impact on the real economy has renewed scholars' attention on the determinants of business cycles and their impact on entrepreneurial activity. From a theoretical perspective, Parker [13] carries out a meticulous review study of the different business cycle theories in which entrepreneurship has a key role. The three groups of models analyzed (creative destruction, innovation and implementation cycles, and production under asymmetric information) conclude on the procyclicality of entrepreneurship. The empirical research does not offer the same results. Depending on the time series, the variables used to measure entrepreneurial activity, and the countries and regions analyzed, the results are ambiguous with procyclical or countercyclical behaviors [10–13,41–43].

These opposing results are also repeated for cooperatives. Indeed, its anticyclical behavior has been widely analyzed in the literature from the perspective of employment because of the importance of the work factor in this business form [44]. Most studies show that in a situation of economic crisis,

cooperatives have greater resistance to job destruction [45–48]. This greater resilience is based on greater flexibility by allowing employment to be adjusted through the hours worked and not in the number of employees [49]. The generation of new cooperatives also shows conflicting behaviors, although the empirical evidence only focuses on worker cooperatives. The creation of this type of cooperative in recessive phases of the economy would be the result of high levels of unemployment, unsatisfactory labor relations, and the takeover of companies in crisis [21–24,26]. Despite this evidence, Ben-Ner [27] disagrees with this position, suggesting that the countercyclical behavior is based on necessity that is not incompatible with the creation of cooperatives in periods of expansion. This point of view is held by Conte and Jones [28], Rusell and Hanneman [29], and Staber [30], who demonstrate the procyclical tendency of workers' cooperative in the United States, Israel, and Canada, respectively.

Ben-Ner's [27] approach to necessity as the basis for the generation of cooperatives leads us to make two reflections. First, literature on entrepreneurship shows that need as a motivation to create a new company entails a lower probability of survival, being strongly related to the work experience [50–52]. This aspect is particularly important when the new venture is a refuge from an unemployment situation [47,53]. Secondly, for almost two centuries, unsatisfied citizens–consumers–entrepreneurs have been creating cooperatives to satisfy their own needs driven by the lack of accessibility to products and services. Based on specific values and principles and their structural integration of the community interest, the dynamics of cooperatives have allowed them to meet the needs of social groups, communities, and regions inadequately served by the market. Assuming that cooperatives are always the result of necessity, regardless of the economic scenario of reference, we proposed our first hypothesis:

**Hypothesis 1 (H1).** *The size of the cooperative sector in global and sectoral levels is positively related to the business cycle.*

The SSE is sufficiently distinct to constitute a domain of the economy [54,55] based on “its organizational characteristics, institutional rules and particular relationship with the state and the market” [56] p. 15. In effect, it is called the third sector because the constituent organizations are created by private initiative but respond to collective and social interests. The growth of the SSE depends on its relationships to the business structure—that is, enterprises belonging to public and traditional private sectors [57]. This interaction has complex effects, although the literature is clear on the positive impact of the business climate on the growth of entrepreneurial activity in whatever form it takes [2,11,58–60]. Based on this, cooperatives should move in the same direction as the other business sectors.

This parallel behavior should also occur between the different organizations that integrate the SSE. Ecuadorian SSE groups three organizational families (community groups, associations, and cooperatives) with different origins, paths, and objectives [38]. Cooperatives are the core group of SSE, with a great tradition in the Ecuadorian economy, being the first country in Latin America to regulate them in 1937, unlike the associations and community groups whose institutionalization took place in 2011 with the enactment of the SSE law. At first glance, it could be thought that the generation of new entities could move towards associations and community groups to the detriment of cooperatives, although it seems unlikely given that these organizations have been carrying out their activities for decades, albeit informally. Following these arguments, we pose the second hypothesis:

**Hypothesis 2 (H2).** *The size of the cooperative sector in global and sectoral levels is positively related to the business structure, including the public sector, traditional private sector, and the SSE organizations excluding cooperatives.*

From a general point of view, the goal of the SSE is to construct an economy based on collective action designed to compensate for the negative effects of the current system with a view to establishing an alternative economic system based on the ethical principle of reproduction and development of

life [61,62]. This conceptualization of the SSE qualifies the sector as a catalyst for restoring economic and social progress, which have come to be considered key elements in the achievement of the Sustainable Development Goals (SDGs). Indeed, the principles and values of the SSE as people-centered and planet-sensitive organizations coincide with the principles that guide SDGs, making the SSE an engine of change for the attainment of SDGs [18,35,63]. In the specific case of Ecuador, SSE has two aims: it provides an alternative to the current economic system as an instrument for changing models of development, striving for a social and supportive economic system; and it is also a blueprint for social change, placing human beings at the center of economic activity [39,64].

Scholar and policymakers agree that growth, consolidation, and long-term survival of the SSE require a specific ecosystem derived from its particular characteristics and its socioeconomic, political, and cultural implications, which are different from those found in traditional companies [20,65]. Public policies are an important part of this ecosystem. The transformative power of SSE in terms of economic and social change depends on the scope of the public policy used [31,35,57]. During the last two decades, numerous Latin American governments have advanced introducing new legal frameworks to regulate and promote the SSE, implementing specific policies and programs, integrating the SSE in national development plans, and creating specific agencies to oversee its development [34,35,40,66,67].

Ecuador represents a unique case for the integral and global approach adopted using multifaceted interventions, ranging from the legal and institutional sphere to measures to eliminate structural barriers that impede the development of SSE. Following Chaves [31] and Chaves and Monzon [20] on SSE policies typology, Ecuador has implemented both soft and hard policies. In the first case, the aim is to institutionalize the SSE in the legal and economic system and to foster SSE culture, while in the second case, the intervention focuses on the economic process of SSE “with incentives, both from the supply side, promoting its economic competitiveness in the different business roles in the value chain, and from the demand side, improving access of these social enterprises into public markets and international markets” [31] p. 68.

Although the starting point of the SSE public policy was the approval of the new Magna Carta in 2008, it was not until three years later that the different measures began to be implemented. In 2011, the Law of Popular and Solidarity Economy (LEPS) was enacted as a proper legal framework for the sector. This law created a specific regulatory agency, the Superintendency of Popular and Solidarity Economy (SEPS), with the goal of formalizing, overseeing, and regulating SSE institutions, which until then had had no supervision. This legal and institutional framework was completed with different measures in the national development plans and multiple initiatives included in other kinds of sectoral policies in a continuous process to adapt the institutional setting to the functioning of the sector, not only for internal organization but also for market presence [68].

While the theoretical debate on the impact of public policy on SSE is not well developed, it has been a core group for cooperatives. Although the history spans nearly two centuries, it was not until the beginning of the millennium that different international organizations, such as the International Labour Office (ILO) and the United Nations, issued recommendations that called on governments to create favorable environments for their development. This was a consequence of their important contribution to the economy and economic and social development of countries [69,70]. The inadequacy of policies and legislation is recognized as one of the main barriers impeding the full use of the potential of cooperatives as an economic agent on equal terms with other business models [46,71,72]. As such, their reformulation is essential to their development [73–77].

Even though Ecuador was one of the first Latin American countries to institutionalize cooperatives, its development was irregular as a consequence of the absence of measures for its promotion and the regulation’s inadequacy [78,79]. The Latin American economic crisis at the end of the last century and the deregulation process in some key sectors drove to an unprecedented crisis involving the bankruptcy of nearly the entire banking system. This provoked a massive mobilization of deposits to the cooperative sector, which highlighted its crucial role in the Ecuadorian economy and society.

In this context, a new public policy for the SSE was developed with the cooperative movement as a key actor. Based on this, we propose our last hypothesis:

**Hypothesis 3 (H3).** *The size of the cooperative sector in global and sectoral levels is positively related to the new SSE public policy.*

### 3. Methodology

Since the objective was to validate whether cooperatives move in the same direction as business cycles, we followed Burns and Mitchell [80] p. 3, who define business as “a type of fluctuation found in the aggregate economic activity of nations that organize their work mainly in business enterprises: a cycle consists of expansions occurring at about the same time in many economic activities, followed by similarly general recessions, contractions, and revivals which merge into the expansion phase of the next cycle.” The literature uses gross domestic product (GDP) and unemployment as indicators of the business cycle in such a way that the variations in the entrepreneurial activity are positively associated with variations in output and negatively related to variations in unemployment [13,41,81–84]. In order to validate the quality of new ventures, necessity versus opportunity, and survival, we disaggregated unemployment among layoff and people seeking employment for the first time in line with Alvarez-Sousa [50], Rico Belda and Cabrer-Borrás [51], and Rider, Thompson, Kacperczyk, and Tag [52], and we added that the rate of employment given to the high level of labor force participation is related to a higher opportunity-based entrepreneurship [82,84].

The consideration of business structure as an impact factor in the entrepreneurial activity has not been widely used in the literature. Lundstrom and Stevenson [84] and Perotin [26] use the density of business owners, while Sala-Rios, Torres-Sole, Farre-Perdigue [44], and Roman Cervantes [53] use the size of the business sector, but without differentiating between the different typologies. Since the new Ecuadorian Magna Carta establishes the SSE as the distinct economic sector from public and traditional private ones, we introduced this differentiation as a variable to analyze the coexisting relationships between them.

In the case of the SSE public policy (SSE-PP) variable, we followed Perotin [26]. This author uses a dummy variable to include the result of parliamentary elections. In our case, the use of a dummy variable was appropriate given the difficulty of capturing the effects of different public initiatives in a single indicator. In this way, SSE-PP took the value 0 for the years 2007–2011 and 1 for the years 2012–2017, collecting the effects of the SSE public policy. Please note that the first measure of the new SSE public policy was the enactment of the LEPS in 2011 and, therefore, 2012 will be the first year with the dummy effect.

The dependent variable of the study was the size of the Ecuadorian cooperative sector, understood as the number of living cooperatives in each year. The literature linking business cycles and cooperatives uses the entry rate [26,44,48], but the absence of reliable information on cooperative creation and exit in Ecuador drove us to use the global values. On the other hand, it is necessary to point out that the choice of cooperatives among the different organizational forms included within the SSE was based on two reasons: (a) it was the one that had the greatest impact on the national economy, with a volume of assets that represented 87% of the SSE [68]; and (b) it was the only one that had historical data before the appearance of the new legal and institutional framework, which made it possible to carry out an impact analysis.

To validate the impact of the independent variables on the Ecuadorian cooperative dimension (the dependent variable), a panel data model with cross-sectional fixed effects was used from 2007 to 2017. As the analysis was performed from a sectoral and territorial perspective, two adjustments were made. First, the variables used in the model were broken down by provinces, so an adjustment derived from a change in the political and administrative structure was necessary. The separation of Amazonia, Guayas, and Pichincha resulted in an increase in the number of provinces during the period of analysis from 16 to 24. As there were no historical data for the disaggregated situation, the initial

structure of 16 provinces was used. Second, the analyses were performed according to the typology recognized in regulation: consumer, production, services, and housing. Entities from the financial sector were excluded because of the specific regulation pertaining to them.

The general expression for the cross-sectional fixed effects model (effects of the provinces) was the following:

$$Y_{it} = \beta_0 + \sum_{i=1}^{N-1} \alpha_i d_i + \sum_{k=1}^K \beta_k X_{kit} + \varepsilon_{it} \quad (1)$$

where:

$Y_{it}$  (COOPit) = Dependent variable, number of cooperatives in province “ $i$ ” in time period “ $t$ ”, with  $i = 1, 2 \dots 16$  and  $t = 2007, 2008, \dots, 2017$ . Source: National Agency for Cooperatives of the Ministry of Economic and Social Inclusion and SEPS.

$\alpha_i$  = Coefficient of the dichotomous N-1 variables that capture the effect of each of the provinces in the dependent variable of the model. This coefficient is invariable in time but varies from one province to another.

$d_i$  = Dichotomous variable for province  $i$ , takes the value 1 for the province it represents and 0 for the rest of the provinces.

$\beta_0$  = Independent term for the province whose term  $\alpha$  has been excluded.

$\beta_k$  = Coefficient that accompanies the independent variable  $X_k$ .

$X_{kit}$  = Independent variable  $k$  in province  $i$  at time  $t$ . In our model, we have eight independent variables:

- $X_{1it}$  (GDP<sub>it</sub>) = Gross domestic product (GDP) per capita in current U.S. dollars in province  $i$  at time  $t$ . Source: Central Bank of Ecuador.
- $X_{2it}$  (EMP<sub>it</sub>) = Rate of employment defined by the ratio between the number of people employed and the working age population in province  $i$  at time  $t$ . Source: National Institute of Statistics and Censuses of Ecuador (INEC).
- $X_{3it}$  (UNEMP-LAY<sub>it</sub>) = Layoffs (people with jobs before the situation of unemployment) in province  $i$  at time  $t$ . Source: INEC.
- $X_{4it}$  (UNEMP-NEW<sub>it</sub>) = New unemployment (people who are looking for jobs for the first time) in province  $i$  at time  $t$ . Source: INEC.
- $X_{5it}$  (SSE-NOCOOP<sub>it</sub>) = Dimension of the SSE without cooperatives in province  $i$  at time  $t$ . The dimension was measured by the number of entities. The calculation of this variable varied from 2007 to 2011 and from 2012 to 2017. The absence of recognition of the SSE as a sector before 2011 drove us to calculate its size considering mutual societies and associations following the concept of the European SSE. The enactment of the LEPS and the availability of data allowed us to consider the voluntary and community sectors for the second period. Source: INEC and SEPS.
- $X_{6it}$  (PUBLIC<sub>it</sub>) = Dimension of the public sector in terms of the number of state-owned companies in province  $i$  at time  $t$ . Source: INEC.
- $X_{7it}$  (PRIVATE<sub>it</sub>) = Dimension of the conventional private sector in terms of the number of traditional private companies in the province  $i$  at time  $t$ . Source: INEC.
- $X_{8it}$  (SSE-PP<sub>it</sub>) = Dummy variable that captured the effect of the SSE public policy in province  $i$  at time  $t$ . It took the value 1 for the years 2012–2017 and 0 for the years 2007–2011.

Based on this general equation, the same equation was estimated by types of cooperatives, substituting the dependent variable  $Y_{it}$  for the variables  $Y_{1it}$ ,  $Y_{2it}$ ,  $Y_{3it}$ , and  $Y_{4it}$ . These new dependent variables are:

- $Y_{1it}$  (COOP-C<sub>it</sub>) = Number of consumer cooperatives in province  $i$  at time  $t$ .
- $Y_{2it}$  (COOP-P<sub>it</sub>) = Number of production cooperatives in province  $i$  at time  $t$ .
- $Y_{3it}$  (COOP-S<sub>it</sub>) = Number of service cooperatives in province  $i$  at time  $t$ .

- $Y_{4it}$  (COOP-H<sub>it</sub>) = Number of housing cooperatives in province  $i$  at time  $t$ .

The new expression of the equation was:

$$Y_{jit} = \beta_0 + \sum_{i=1}^{N-1} \alpha_i d_i + \sum_{k=1}^K \beta_k X_{kit} + \varepsilon_{it} \quad (2)$$

$j = 1, 2, 3, 4$  were the four types of cooperatives analyzed (consumer, production, services, and housing). Table 1 shows the descriptive statistics of the model variables for Equation (2).

**Table 1.** The descriptive statistics.

Variables	Statics						
	Mean	Median	Maximum	Minimum	Std. Dev.	Skewness	Kurtosis
COOP <sub>it</sub>	151.2	95.0	601.0	41.0	137.9	2.1	6.2
COOP-C <sub>it</sub>	0.7	0.0	4.0	0.0	1.0	1.3	3.6
COOP-P <sub>it</sub>	19.9	10.0	71.0	1.0	18.4	1.0	2.9
COOP-S <sub>it</sub>	114.2	88.0	403.0	30.0	98.9	1.8	5.2
COOP-H <sub>it</sub>	16.4	6.0	146.0	1.0	32.7	3.3	12.8
GDP <sub>it</sub>	5,171,052.0	2,053,950.0	30,395,226.0	301,742.1	7,314,816.0	2.2	6.8
EMP <sub>it</sub>	63.6	63.2	78.6	49.9	6.2	0.2	2.4
UNEMP-LAY <sub>it</sub>	13,711.1	6171.5	127,758.0	342.0	22,621.3	2.8	10.2
UNEMP-NEW <sub>it</sub>	7169.6	3833.0	54,721.0	564.0	9122.1	2.6	10.5
SSE-NOCOOP <sub>it</sub>	73.2	57.0	291.0	0.0	69.8	1.4	4.5
PUBLIC <sub>it</sub>	38,312.0	24,601.5	229,598.0	2065.0	47,303.7	2.6	9.3
PRIVATE <sub>it</sub>	339.1	176.0	2863.0	5.0	491.6	3.1	13.3

Source: Own elaboration.

#### 4. Results and Discussion

The estimations of Equations (1) and (2) for the entirety of the cooperative movement and each of the activities are collected in Table 2. Generalized least squares (GLS) was used to correct problems of heteroscedasticity and autocorrelation.

Once the equations were estimated, following Engle and Granger [85], we ensured that a cointegration relationship existed to avoid the problem of obtaining spurious results when introducing spurious relationships in the use of panel data [86–88]. In order to prove the existence of cointegration, the properties of unit roots in panel data must be examined. There are two approaches to this: namely, the first, Breitung [89] and Levin, Lin, and Chu [90] tests assume that the autoregressive coefficient in the process that generates the time series are common for all cross sections; while the second assumes that the autoregressive coefficient varies between cross-sectional units. Included in this group, we have the Im, Pesaran, and Shin (IPS) test; the Augmented Dickey–Fuller Discher (ADF-Fisher) test; and the Phillips–Perron Fisher (PP-Fisher) [91–93]. Both approaches consider the existence of a unit root as a null hypothesis, which implies that the series are non-stationary in the panel. Table 3 contains the five-unit root tests applied to the twelve time series, which indicated the levels at which these series had unit roots, given that the probability of the tests did not allow the rejection of the null hypothesis of the existence of unit roots. The tests applied to the first difference in each series showed that they had no unit root and, therefore, were stationary (Table 4). In summary, the results of the unit root tests showed that the four series were integrated of order one.

**Table 2.** Estimation of the regressions: global cooperative sector and by activities.

Dependent Variable:  $Y_{it}/Y_{jit}$   
 Method: Panel EGLS (Cross-section weights)  
 Sample (adjusted): 2008 2017  
 Cross-sections included: 16  
 Linear estimation after one-step weighting matrix  
 White cross-section standard errors & covariance (no d.f. correction)

Variables	Global Coop. Sector (COOP <sub>it</sub> )	Consumer cooperatives.(COOP-C <sub>it</sub> )	Production cooperatives (COOP-P <sub>it</sub> )	Services cooperatives (COOP-S <sub>it</sub> )	Housing cooperatives (COOP-H <sub>it</sub> )
	Coefficient	Coefficient	Coefficient	Coefficient	Coefficient
C	127.6420 ***	1.388916 ***	−2.026138	104.402 ***	16.31964 ***
GDP <sub>it</sub>	0.00000114 ***	0.000000479 ***	0.000000594 ***	0.00000165 ***	−0.000000355 ***
EMP <sub>it</sub>	0.193348***	−0.017447***	0.279066***	−0.014703	0.020246
UNEMP-LAY <sub>it</sub> (−1)	0.000401 ***	0.0000141 ***	0.000205 ***	0.000166 ***	−0.0000482 ***
UNEM-NEW <sub>it</sub> (−1)	−0.000511 ***	−0.0000286 ***	−0.00036 ***	−0.0000935	−0.00000335
SSE-NOCOOP <sub>it</sub>	−0.006546	0.002022 ***	−0.005706	0.010148	−0.004733
PUBLIC <sub>it</sub>	0.0000479	−0.00000169	−0.000000826	−0.0000496	0.0000504 ***
PRIVATE <sub>it</sub>	0.004514 ***	0.000363 ***	0.002303 ***	0.003938 ***	−0.000741 ***
SSE-PP <sub>it</sub>	2.373563 ***	−0.060468	1.731268 ***	0.804702	0.181351
	Weighted Statistics	Unweighted Statistics	Weighted Statistics	Unweighted Statistics	Unweighted Statistics
Adjusted R <sup>2</sup>	0.998973	0.961331	0.980974	0.997864	0.998728
F-statistic	6724.125 ***	172.864 ***	357.4298 ***	3230.42 ***	5429.913 ***
Durbin-Watson stat	1.279717	0.964596	1.18947	1.291931	1.338116

Source: Own elaboration. \*, \*\*, \*\*\* show significance at 10, 5 and 1% levels, respectively.

Table 3. Panel Unit Root Test Results (Levels).

Tests	GDP <sub>it</sub>		EMP <sub>it</sub>		UNEMP-LAY <sub>it</sub>		UNEMP-NEW <sub>it</sub>	
	Stat.	Prob.	Stat.	Prob.	Stat.	Prob.	Stat.	Prob.
Levin, Lin, & Chu	−4.23647	0.0000	−5.51678	0.0000	−0.51077	0.3048	−7.42318	0.0000
Breitung t-stat	−0.09034	0.464	2.26428	0.9882	1.18611	0.8822	−1.19437	0.1162
Im, Pesaran, & Shin W-stat	−0.2469	0.4025	−0.27303	0.3924	0.68252	0.7525	−2.85598	0.0021
ADF-Fisher Chi-square	37.8582	0.2194	32.192	0.4573	25.8935	0.7683	73.1401	0.0000
PP-Fisher Chi-square	25.0288	0.8049	42.6166	0.0994	17.8939	0.979	69.3884	0.0001
Tests	SSE-NOCOOP <sub>it</sub>		PUBLIC <sub>it</sub>		PRIVATE <sub>it</sub>		COOP <sub>it</sub>	
	Stat.	Prob.	Stat.	Prob.	Stat.	Prob.	Stat.	Prob.
Levin, Lin, & Chu	−0.27648	0.3911	−6.48592	0.0000	−5.39068	0.0000	1.20558	0.886
Breitung t-stat	1.11526	0.8676			1.9002	0.9713		
Im, Pesaran, and Shin W-stat	2.78132	0.9973	−0.688	0.2457	0.01439	0.5057	4.85321	1.0000
ADF-Fisher Chi-square	10.999	0.9998	31.9786	0.4678	27.3872	0.6993	10.5879	0.9999
PP-Fisher Chi-square	9.08514	1.0000	20.6786	0.9385	42.9373	0.0938	10.4166	0.9999
Tests	COOP-C <sub>it</sub>		COOP-P <sub>it</sub>		COOP-S <sub>it</sub>		COOP-H <sub>it</sub>	
	Stat.	Prob.	Stat.	Prob.	Stat.	Prob.	Stat.	Prob.
Levin, Lin, & Chu	0.00609	0.5024	1.76388	0.9611	1.21539	0.8879	−4.21681	0.0000
Breitung t-stat	2.10896	0.9825						
Im, Pesaran, and Shin W-stat	1.54771	0.9392	4.35651	1.0000	1.25893	0.896	−1.42454	0.0771
ADF-Fisher Chi-square	0.21558	0.9946	17.4989	0.9824	35.4828	0.1016	31.0398	0.1526
PP-Fisher Chi-square	0.18714	0.9959	13.5081	0.9983	12.8564	0.9852	31.9337	0.1286

Source: Own elaboration.

**Table 4.** Panel Unit Root Test Results (Difference).

Tests	GDP <sub>it</sub>		EMP <sub>it</sub>		UNEMP-LAY <sub>it</sub>		UNEMP-NEW <sub>it</sub>	
	Stat.	Prob.	Stat.	Prob.	Stat.	Prob.	Stat.	Prob.
Levin, Lin, & Chu	−11.2201	0.0000	−9.93477	0.0000	−9.83654	0.0000	−13.1291	0.0000
Breitung t-stat	−1.87875	0.0301	−2.93475	0.0017	−1.23731	0.1080	−2.03599	0.0209
Im, Pesaran, and Shin W-stat	−2.46315	0.0069	−2.08954	0.0183	−1.91658	0.0276	−2.97648	0.0015
ADF-Fisher Chi-square	73.2248	0.0000	70.0825	0.0001	65.1663	0.0005	91.1244	0.0000
PP-Fisher Chi-square	113.633	0.0000	130.395	0.0000	75.7957	0.0000	186.979	0.0000
Tests	SSE-NOCOOP <sub>it</sub>		PUBLIC <sub>it</sub>		PRIVATE <sub>it</sub>		COOP <sub>it</sub>	
	Stat.	Prob.	Stat.	Prob.	Stat.	Prob.	Stat.	Prob.
Levin, Lin, & Chu	−10.0614	0.0000	−5.48561	0.0000	−13.8433	0.0000	−3.66841	0.0001
Breitung t-stat	−0.66002	0.2546			−0.75388	0.2255		
Im, Pesaran, and Shin W-stat	−1.56275	0.0591	−1.82225	0.0342	−3.72494	0.0001	−3.34694	0.0004
ADF-Fisher Chi-square	57.9477	0.0033	46.3588	0.0484	92.0552	0.0000	65.1268	0.0005
PP-Fisher Chi-square	88.7472	0.0000	21.9551	0.9086	92.0552	0.0000	60.239	0.0018
Tests	COOP-C <sub>it</sub>		COOP-P <sub>it</sub>		COOP-S <sub>it</sub>		COOP-H <sub>it</sub>	
	Stat.	Prob.	Stat.	Prob.	Stat.	Prob.	Stat.	Prob.
Levin, Lin, & Chu	−5.8137	0.0000	−6.76828	0.0000	−1.75278	0.0398	−6.26657	0.0000
Breitung t-stat	0.69139	0.7553						
Im, Pesaran, and Shin W-stat	−1.24923	0.1058	−4.01524	0.0000	−3.92193	0.0000	−2.40103	0.0082
ADF-Fisher Chi-square	12.3825	0.0147	76.7124	0.0000	61.5051	0.0001	45.9669	0.0008
PP-Fisher Chi-square	15.8831	0.0032	75.4837	0.0000	43.0981	0.0189	65.3776	0.0000

Source: Own elaboration.

At this point, the cointegration test was performed for the panel model of Equation (2) in its five variants to confirm that they were not spurious regressions. In order to achieve this, the Kao cointegration test [87] was used. It is based on the residuals of the estimated regression, which essentially follows the Engle–Granger strategy. Kao’s test starts from the following model and assumes that the slope is unique across the panel, and it assumes homogeneity among the social units. If  $y_{it}$  and  $x_{it}$  are integrated of order 1,  $y_{it} = y_{it-1} + \mu_{it}$  y  $x_{it} = x_{it-1} + u_{it}$  follow a random walk without drift and, under the null hypothesis of no cointegration, the residual panel must be non-stationary.

That is:

$$y_{it} = \alpha_i + \beta x_{it} + e_{it}$$

$$\hat{e}_{it} = \rho \hat{e}_{it-1} + v_{it}$$

where:

$$\hat{\rho} = \frac{\sum_{i=1}^N \sum_{t=2}^T \hat{e}_{it} \hat{e}_{it-1}}{\sum_{i=1}^N \sum_{t=2}^T \hat{e}_{it-1}^2}$$

Being the null hypothesis,  $H_0: \rho = 1$ , stating that the variables are not cointegrated versus the cointegration alternative.

Table 5 shows the results of the Kao tests, allowing us to conclude the existence of a long-term relationship between the series, with a significance level of 5% and 1%. Therefore, we can affirm that the model specified in Equation (2) allowed consistent and efficient estimators to be obtained for the regressions, using the total number of cooperatives as well as by type.

**Table 5.** Kao Residual Cointegration Test Results.

Equations	t-Statistic	Prob.
Global Cooperative Sector ( $Y_{it}$ ) equation	−2.40788	0.0080
Consumer cooperatives( $Y_{1it}$ ) equation	−4.910225	0.0000
Production cooperatives( $Y_{2it}$ ) equation	−2.441333	0.0073
Services cooperatives( $Y_{2it}$ ) equation	−2.406536	0.0081
Housing cooperatives( $Y_{3it}$ ) equation	−6.350208	0.0000

Source: Own elaboration.

The regression results allowed us to confirm the hypothesis proposed, although only partially. From a global perspective, the most influential variable was the SSE policy (coefficient 2.37), confirming the theoretical contributions, which advocate appropriate public policies to allow cooperatives to operate under the same conditions as other business models [46,71,72,74,76]. The positive significance of GDP and employment (coefficient 0.00000114 and 0.193348, respectively) confirmed the procyclical behavior of the cooperative sector in line with Conte and Jones’s [28], Russell and Hanneman’s [29], and Staber’s [30] studies for worker cooperatives. The positive relationship with the layoffs (UNEMP-LAY 0.000401) allowed us to confirm the existence of a small refuge effect for those unemployed with job experience in line with the results obtained by Sala Ríos, Torres Solé, and Farré Perdiguer [44]. These authors show that cooperatives are procyclicality-sensitive to the phases of the business cycle, gradually eliminating the refuge effect of unemployment. This tendency was reinforced by the positive relationship between private business and cooperatives (PRIVATE 0.004514), which confirmed that a favorable climate increases entrepreneurship capital in accordance with the works of Audretsch [59], Audretsch and Keilbach [3], Koellinger and Thurik [11], and Urbano and Aparicio [60].

The sectoral results differed substantially from the global ones, with an unequal impact of all the variables analyzed. The SSE policy was significantly positive only in the case of production cooperatives (coefficient 1.731268). This relationship was not neutral because the different national development plans had the fostering of sovereignty through the development of supply chains and the transformation of the production matrix by incorporating the value added to production as the main

aim [94]. This mandate was included as a goal in the SSE policy in order to drive the SSE towards the access to markets, productive activities and means of production, and increasing the capacity of small producers in terms of productivity, association, efficiency, and competitiveness. This alignment of the production cooperatives to the public policy is justified on two grounds. Firstly, they are the only ones in which member participation in the cooperative activity is as suppliers of goods and services, unlike in the other types, where the participation is as consumers. Secondly, the economic activities of production cooperatives (mining, fisheries, farming, and agribusiness) are almost all located in rural areas. As noted in several studies [95,96], new cooperatives might help to reduce poverty and labor informality, two important problems in developing countries.

The impact of income and unemployment in the different types of cooperatives exhibited a procyclical behavior, except for the housing sector. This confirmed the results of the studies by Conte and Jones [28], Russell and Hanneman [29], and Staber [30], who focused on workers' cooperatives; however, we can conclude that this also applies to the consumer and services sectors. The negative relationship of these two variables (GDP-0.000000355 and UNEMP-LAY-0.0000482) with the size of the housing cooperatives could be based on their nature. A housing cooperative is a special type of consumer cooperative: its objective is to obtain a house at a lower price than the market. The decision to buy a home requires a long-term savings and investment plan and the accessibility of mortgage loans that are incompatible with a situation of economic recession.

The employment rate was only significant in consumer and production cooperatives, but with opposite effects. In Ecuador, consumer cooperatives sell food, drinks, and clothing to their members. In line with the results of Sala Ríos, Torres Solé, and Farré Perdiguier [44], consumer cooperatives allow them to cover needs in a common way as a defense during times of austerity marked by a decrease in family income. In the case of production cooperatives, the employment rate was the second most important variable (EMP 0.279066) after the SSE policy. Although a greater number of employed people had influence in all sectors, it was the primary sector that generated the most employment, being, along with oil, the two engines of the Ecuadorian economy [97]. This dynamism of the primary sector had a positive impact on production cooperatives dedicated to mining, fisheries, farming, and agribusiness activities.

The impact of unemployment on the different types of cooperatives—except the housing sector, as explained above—was the same as in the global analysis. Its positive impact showed its importance as a factor in the cooperatives, although the low value of the coefficients indicated that its refuge effect from unemployment was limited, with a greater impact in those sectors in which the labor factor was key to the production and services cooperatives (0.000205 and 0.000166 UNEMP-LAY coefficients, respectively). As in the global analysis, unemployment without job experience had a negative relationship, which was an indicator of cooperative opportunity-based creation, although it was only significant for consumer and production types (-0.0000286 and -0.00036 UNEMP-NEW coefficients, respectively).

The impact of the business structure on the different types of cooperatives was the same as in the global analysis, although with two exceptions: the positive relationship between private sector and cooperatives confirmed that a favorable business climate increased new ventures in whatever form it took, although with a greater influence on production and services cooperatives (PRIVATE coefficient 0.002303 and 0.003938, respectively) than on consumer ones; and the positive relationship between non-cooperative SSE and consumer cooperatives (SSE-NOCOOP 0.002022) showed a crowding-in effect. Although their origins and evolution are different, especially in terms of institutionalization, their goals converge as providers of social goods and services to improve not only their members, but also the community [38].

In the case of housing cooperatives, the results showed a crowding-out effect for the private sector (PRIVATE-0.000741) and crowding-in for the public (PUBLIC 0.0000504), which were in line with the problem of the construction sector in Ecuador. Land speculation, limited saving capacity, and inaccessibility to mortgage loans for much of the population make housing one of the country's biggest problems [98,99]. In this context, with a housing shortage of 31%, mainly in urban areas,

housing cooperatives are an alternative for the middle and lower classes because of their design and their purpose. Housing cooperatives are integrated systems of distribution that unite several intermediaries of the marketing channel in one organization. This feature, along with the advanced application of economic profitability for members, who are final consumers, have a double effect on reducing the price of the housing, lowering it under the market price. This makes housing cooperatives a perfect partner of the public sector for the construction of social housing [100], as they are included in different sectoral programs for the acquisition of housing implemented by Ecuadorian authorities with funds from different international organizations. The lower profitability of social housing makes the private sector have a smaller presence [101].

Although this work has analyzed some of the factors that the literature considers most relevant for their impact on entrepreneurial activity, the range of possible influences is very wide. In the words of Lundstrom and Stevenson [84] p. 154, context matters, referring “to a range of economic, social, cultural, attitudinal and structural aspects” of a specific territory that must be considered to construct an integrated policy. To verify the characteristics of each Ecuadorian province, the unobservable individual effects ( $\alpha_i$  in Equation (2)) were calculated for each cooperative category. When working with a fixed effects panel data model, we can observe how individuals (provinces in our case) with identical observable characteristics behave differently due to the existence of unobservable factors. Likewise, the same province may behave differently in different periods of time due to unobservable temporal factors, such as those caused by the new public policy. If these unobservable effects were not considered in the model specification, there would be a problem of omitted variables yielding a wrong specification.

Table 6 contains the unobservable effects ranked from highest to lowest importance for each type of cooperative. The differences between provinces would be determined by demographic, economic, and sectoral inequalities, which would explain why spaces that grow more attract more entrepreneurs and have positive effects on levels of entrepreneurial activity [58,59,102,103]. In the case of cooperatives, this entrepreneurship capital, understood as “the capacity of a spatial unit of analysis to generate entrepreneurial activity” [4] p. 8, would include the prior existence of cooperatives in each territory. Thus, when the cooperative sector is firmly entrenched in a territory, this culture favors the creation of new cooperatives, perpetuating the model in certain regions or countries [26,44,73,104,105].

The results obtained in this work have some implications for policymakers. Firstly, the SSE policy has had a positive effect on the size of the cooperatives, although this impact is limited to the production cooperatives, not translated to the other types. This leads to recommending a revision of interventions put in place in order to incorporate specific measures to try to transfer this positive effect to the rest of the cooperative typologies. Secondly, the construction of a legal and institutional system does not guarantee the generation of a greater dimension of the sector because cultural changes are needed to change attitudes towards non-conventional forms of enterprises [68]. The differentiating characteristics of cooperatives as democratic companies, based on the contribution of members to the economic activity, consumers, or suppliers, and on the fairness of the distribution of the profits, might pose an initial barrier. It is difficult to overcome this limitation when the cooperative option is not considered as an alternative business model. This lack of consideration creates a clear preference for conventional capitalist structures that are simpler to understand, create, and maintain [90]. Thirdly, given that each territory presents different problems, a territorial focus would be most appropriate. Ecuador’s most recent National Development Plan (2017–2021) is based on territorial development, one of its pillars, with three guidelines, including territorial administration and multi-level governance [106,107]. The commitment to the decentralization of policies should be applied to the SSE so that each territory can design measures tailored to its specific problems. Fourthly, cognitive measures should be taken to increase the level of knowledge about society through the promotion and dissemination of research and education [31]. This last element is particularly important, given the absence of educational material about cooperativism in the curricula of secondary and tertiary education, which focus only on offering the dynamic of conventional capitalist enterprises [71,108–110]. Logically, it is not surprising that entrepreneurs rarely consider the cooperative option, even when it is the most appropriate for their activities and needs.

**Table 6.** Individual effects by provinces and activities presented in descending order.

Global Cooperative Sector			Consumer Cooperatives		Production Cooperatives			Services Cooperatives		Housing Cooperatives	
Province	2008–2011	2012–2017	Province	2008–2017	Province	2008–2011	2012–2017	Province	2008–2017	Province	2008–2017
Pichincha	507.8	510.2	Azuay	3.8	Esmeraldas	28.5	30.3	Pichincha	342	Pichincha	143.03
Guayas	358.4	360.8	Imbabura	2.9	Guayas	23.4	25.1	Guayas	289	Guayas	30.89
Manabi	167.9	170.3	Cotopaxi	2.1	Manabi	23.4	25.1	Tungurahua	142	Chimborazo	19.96
Tungurahua	137.9	140.3	Pichincha	2.0	El Oro	18.0	19.7	Manabi	127	Azuay	17.39
Azuay	123.0	125.4	Manabi	1.6	Pichincha	5.1	6.8	Chimborazo	101	Manabi	9.79
El Oro	122.6	125.0	Bolívar	1.1	Los Ríos	−3.1	−1.4	Azuay	99	Amazonia	8.18
Chimborazo	114.4	116.8	Cañar	1.1	Azuay	−3.9	−2.2	El Oro	95	Tungurahua	8.05
Cotopaxi	77.9	80.3	Chimborazo	1.1	Cañar	−7.2	−5.5	Cotopaxi	87	Cañar	6.12
Esmeraldas	71.9	74.2	Guayas	1.0	Bolívar	−9.4	−7.7	Imbabura	75	Esmeraldas	4.93
Imbabura	69.5	71.9	Carchi	1.0	Carchi	−9.7	−8.0	Loja	64	Los Ríos	4.07
Amazonia	64.8	67.1	Tungurahua	0.9	Loja	−11.6	−9.9	Amazonia	63	El Oro	3.04
Loja	59.8	62.2	Loja	0.9	Chimborazo	−13.6	−11.9	Los Ríos	49	Carchi	2.75
Los Ríos	56.5	58.9	El Oro	0.9	Imbabura	−14.3	−12.5	Cañar	46	Loja	0.97
Cañar	50.9	53.3	Esmeraldas	0.8	Cotopaxi	−17.6	−15.9	Esmeraldas	32	Imbabura	0.95
Carchi	30.0	32.3	Los Ríos	0.8	Tungurahua	−19.6	−17.9	Bolívar	31	Bolívar	0.52
Bolívar	28.9	31.3	Amazonia	0.4	Amazonia	−20.7	−18.9	Carchi	31	Cotopaxi	0.48

Source: Own elaboration.

## 5. Conclusions

The SSE integrates all organizations with a differentiated identity based on their features in terms of mission, project, generation of revenue, distribution of profits, and governance, all of which require a framework that favors their creation and development. The importance of public policy as a key instrument for stimulating the development of the SSE has been widely studied in the literature from a theoretical perspective from case studies and good practices. However, there are few empirical studies that address the impact of different public policies, which is why we have made that the focus of this work. In this context and among the set of countries that have undertaken a reform of the SSE, Ecuador represents an exception because of the process of institutionalization it has carried out, having integrated the sector in the national policy. Despite being part of Ecuador's history, the SSE was underestimated until the implementation of the new constitutional framework, from which it emerged as not only an economic alternative, but also a means to social change.

The theoretical analysis and the results obtained allow us to make three contributions to advance our understanding of the impact of public policies on the cooperative sector: (a) although from a global perspective, the new institutionalization has a positive effect on its dimension, sectoral and territorial analyses reveal unequal impacts. In the first case, the results show that only cooperatives devoted to production benefit from the new context in accordance with the goals of development plans to reduce poverty and labor informality, and transform the production matrix. In the second case, cooperativism has been proven to be a factor of attraction, although it is still concentrated in the most developed provinces and has not been able to remedy the country's historical regional and economic imbalances; (b) the behavior of cooperatives during fluctuations of economic activity depends on their type and sector of activity. Apart from the housing sector, their behavior is procyclical. These results add to those of previous studies, which have focused exclusively on workers' cooperatives; and (c) the measure of interaction between cooperatives and other economic sectors is a new variable not empirically included in other studies. This verifies the parallel paths of cooperatives and the conventional private sector in all sectors except housing, where collaboration between the public sector and cooperatives is a means of progress in solving the country's serious housing problem.

The results obtained are promising, above all, because the SSE has undergone a process of radical change, moving from a history characterized by lack of control and support to a strategy of close supervision and support to achieve stability and strength in the sector. Despite these advances, Ecuadorian public policy about the SSE is still a work in progress. In this respect, future guidelines should aim to bolster the impact on cooperatives in the primary sector and make notable progress on regional readjustments. They should also advance in establishing an institutional and cultural framework with compelling and informative instruments that can invigorate the sector. In this vein, a policy of partnership with the cooperative sector itself and the assumption of greater leadership by provincial authorities might initiate a proactive process that confronts the different problems of each territory with a bottom-up approach.

To conclude, it must be noted that this work, despite its contributions to the literature, is limited in ways that prevent us from improving on the results obtained, and overcoming these limitations might form the basis of new lines of research. First of all, the time frame used enables us to validate the effects of the new policy on the cooperative sector, but it would be desirable to expand the time periods to confirm not only the stability of the impacts, but also the improvement of the sectoral and territorial limitations encountered. Secondly, the growth of the cooperative sector is defined as net growth, which might reduce the effect of the public policies. The collection of data on the gross volume of new cooperatives and on liquidated entities might improve the analysis. In addition, access to economic and financial data would allow us to address growth from the internal perspective. Thirdly, the collection of data broken down by provinces on governance, political quality, and public resources used might not only improve the analysis of the impact of public policies on the cooperative sector, but also reveal the influence of the institutional and cultural framework.

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