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Abstract

In the literature on the link between entrepreneurship and unemployment, self-employment is the most frequently used indicator for measuring entrepreneurship. The impact of unemployment on self-employment is known as the "refugee effect". Conversely, the impact of self-employment on unemployment is known as the "entrepreneurial effect". The relationship between the unemployment rate and self-employment is rather an ambiguous question in the economy. There are two counter arguments: the first is the theory of income choice argumentation, which suggests that increased unemployment may lead to an increase of self-employment activities, while the second argues that the increase of the unemployment rate may decrease human capital endowments and entrepreneurial capacity, which drives unemployment rates higher. The results of the existing studies are varied. The aim of this study is to determine the dynamic relationship between unemployment and self-employment in Tunisia during the period 1980-2015 using the ARDL (Auto Regressive Distributed Lag) approach. Tunisia supports positive impact of unemployment on self-employment and supports negative impact of self-employment on unemployment.

Keywords: Unemployment, Self-employment, Tunisia, ARDL

Introduction

Debates about self-employment and unemployment have been paving the way for an increasing number of studies over the past two decades. Oxenfeldt (1943) argues that those facing unemployment rates and low chances of finding paid employment turn to self-employment as a viable alternative. Moreover, Knight (1921) considers that individuals decide between three states: unemployment, self-employment and employment. The main motivation of this research is based on the fact that self-employment is considered as one of the main solutions of economic policy that can keep reduce unemployment in all the countries. Thus, the measurement of the impact of unemployment on self-employment and vice versa should reveal valuable policy information for policy makers.

In fact, the relationship between entrepreneurship and unemployment has created a complex puzzle for researchers. One view, which is called the "unemployment push", or the "refugee effect", recommends that the opinion to become an entrepreneur is an answer to unemployment or the perception of bleak future of employment prospects. Another view, which is called the "Schumpeter effect", or the "entrepreneurial effect", suggests that, by virtue of the creation of a new enterprise, entrepreneurship logically contributes to the reduction of unemployment. While the first view suggests a positive relationship between entrepreneurship and unemployment, the second view suggests a negative relationship. Moreover, in either view, the causal link between entrepreneurship and employment is reversed. The first view suggests that high unemployment rates induce more people to choose to become entrepreneurs. While second suggests that people decision to become entrepreneurs will logically reduce unemployment at the macroeconomic level.

There is a considerable theoretical and empirical support for both points of view; despite, researchers found it difficult to disentangle the relationship between self-employment and unemployment. Therefore, it is important to clarify this relationship, because its understanding can guide policy makers in their decisions to promote entrepreneurship to reduce unemployment. Using an econometric approach, this paper attempts to reconcile ambiguities and understand the interactions between these two variables.

For this reason, we used the cointegration procedure of the Auto Regressive Distributed Lag (ARDL) approach to estimate the changes in unemployment and self-employment for Tunisia over the period 1980-2015. Using the delayed data to explain the current situation, we have modeled the dynamic interrelationship between unemployment and unemployment and found that the relationship between these two variables is both positive and negative. Changes in unemployment apparently have a positive effect on following changes in self-employment rates. Meanwhile, changes in self-employment rates have a negative effect on subsequent unemployment rates. The first effect is stronger than the second. The results of this study have important implications for public policy. More precisely, they clearly suggest that public policies for job creation and reduce unemployment are well served by focusing on entrepreneurship.

Finally, this paper is organized as follows: In a first section, there is a presentation of reduction of unemployment. In a second section, we present self-employment. In a third section, we clarify the bilateral relationship between self-employment and unemployment. Then, we propose a review of the empirical literature for the relationship between these two variables in a fourth section. Finally, the fifth section contains suggestions about our own empirical validation.

Unemployment

The International Labor Organization (ILO) defines unemployed as the number of economically active persons who are unemployed but who are available and are looking for work, including those who have lost their jobs or voluntarily left their job (World Bank, 1998). Actually, unemployment is one of the main indicators of the economic activity. In fact, unemployment has different forms, structural, cyclical, frictional and classical. However, it can have other forms, such as seasonal, hidden and brutal. In fact, the amplitude of each type is difficult to measure, particularly, because they overlap (Sullivan and Sheffrin 2003).

Currently, Tunisia is facing labor market problems. The unemployment rate in Tunisia rose from 12.44% in 2007 to 18.88% in 2011 (see Figure 1). There are many explanations for these developments.

The slowdown of the economic activity, the agitated social context, the suspension of industrial projects, including those financed by FDI (Foreign Direct Investment) and the forced re-entry of many Libyan compatriots after the outbreak of the Libyan revolution of 17 February 2011, aggravated the situation of unemployment in Tunisia.

The first slogan raised during the Tunisian revolution was simply Work, Freedom and National Dignity. Work was then one of the first demands of the people. It is useful to say that when Tunisia made 5% economic growth, there were 491800 unemployed (May 2010), an unemployment rate of 13%. This justifies that the problem of unemployment is not post-revolutionary. One of the primary components of this rate is the unemployment of graduates. Unemployment among university graduates increased from 14% in 2005 to 32% in 2010, which is worrying.

The authorities tried to implement employment policies to curb this situation, through massive recruitment measures at the level of public administration, which did nothing but only exacerbated the deficit of the State budget, or through the advantages givers is the private sector, to recruit graduates, such as through permanents contracts (orientation contracts, qualification contracts, adaptation contracts, apprenticeship contracts, solidarity employment contracts, the Karama contract ...).

The Concept of Self-Employment

Entrepreneurship is a concept that is becoming increasingly important in the international economy; however, it has no universally accepted definition. In fact, entrepreneurship is a complex phenomenon that spans a variety of contexts. Various definitions in literature on entrepreneurship reflect this complexity (Bosma and Acs, 2009). Entrepreneurship, as a term, has a wide range of definitions. The entrepreneur is defined as a person who organizes, manages and assumes the risks of the business.

Entrepreneurship, as it stands today, was first defined by the Austrian economist Carl Menger (1870), who argued that entrepreneurship can be designated as an activity involving the discovery, the evaluation and exploitation of opportunities, with the aim of introducing new goods and services, new organizational structures, new markets, processes, and materials, by means that did not exist before. Schumpeter's theory of economic development (1912) places entrepreneurs at the center of the capitalist development process.

Entrepreneurs are responsible for innovations (new products, new sources of supply, new production methods and new forms of organization) that open up opportunities for profit but disrupt the system. Successful entrepreneurs are those who earn high profits and attract imitators. Over time, imitation will eliminate the benefits gained by an original innovator and the system will settle to a new equilibrium until it is, in turn, disrupted by another innovation.

Self-employment is the most frequently used indicator of entrepreneurship in literature, which deals with a number of issues, such as the level of entrepreneurship in countries, the link between entrepreneurship and growth and between unemployment and entrepreneurship. The main reason for using self-employment, as an indicator of entrepreneurship, is a convenience function: all the

developed countries communicate data on self-employment, while facilitates the analysis across countries and over time.

Several expressions are used in the designation of self-employment. Self-employment is also referred to as "free-lance work" or "autonomous work". For the cooperation organization and of economic development OECD (2000), independent employment is perceived like a very important source of development of the entrepreneurship and the small company, which represents a potential growth of long-term employment.

According to the international definition, "self-employment is a job the remuneration of which is directly related to the benefit where the owner makes the management decisions affecting the company and therefore is responsible for the good health of the enterprise" (OECD, 2000). In this definition, there are notable exceptions, particularly in the case of incorporated business owners who account for a significant share of self-employment in some OECD countries (eg 31, 4% in the USA in 1998).

Owner-managers are the owners of their businesses and responsible for their management, but from a legal point of view, they are employees in the company. As a general rule, the term "self-employment" therefore refers to "those who work for their own account" and to "employers". The definition given by Djaowe and Bita (2007) their study specifies that: "Self-employment is based on the following conditions: it is the result of a free choice, it ensures an adequate income for the family and is based on a relationship of dependency and / or subordination and generates income above the benefits that could be received in the event of assistance".

The statisticians of self-employment distinguish three main categories: independent employment without employees, which corresponds to the category of those who "work for their own account"; independent employment with a paid category of the "employers"; and "not remunerated family workers".

High unemployment rates in Europe have justified the introduction of new business start-up schemes. The development of self-entrepreneurs in Germany and France is due to the emphasis placed by the public authorities on the aid to unemployed creators of a sole proprietorship in order to combat unemployment. Although these measures have overall positive effects on the labor market, they nevertheless lead to an increase of the precariousness of self-employed individuals.

The Relationship between Self-Employment and Unemployment

"At the individual level, the risk of unemployment is likely to have a positive effect on the level of entrepreneurship by reducing the opportunity costs of self-employment" (Audretsch et al., 2002). Specifically, self-employment, which can be considered as a type of entrepreneurship, is expected to have positive effects on economic growth (Manser and Picot, 1999; Mnif, 2015; Feki and Mnif, 2016). The entrepreneurial activities of the self-employed result in the hiring of workers and thus lead to decreases of the unemployment rate. The positive relationship between unemployment and self-employment is known as the "unemployment push" or the "refugee effect". It can be both a positive effect of unemployment on self-employment (the "refugee effect") and a negative effect of self-employment on unemployment (the "entrepreneurial effect"). In fact, both possibilities have been theoretically and empirically studied.

Nevertheless, other assumptions can be made. Hence, it is argued that unemployed people are above all those with a lower level of information, skills and capacities to create new businesses. High unemployment rates reduce the likelihood of self-employment (Thurik et al., 2008). Oxenfeldt (1943) also mentioned that most of the unemployed want to create new businesses but cannot do so because they do not have enough capital. Moreover, "at the macroeconomic level, unemployment may be associated with an economic recession and a lack of entrepreneurial opportunities" (Audretsch et al., 2004, 2002). All these views would suggest that high unemployment may be accompanied by a low rate of self-employment.

Moreover, Schumpeter assumes that the development of entrepreneurship and new start-ups will provide employment opportunities and will indirectly affect the creation of jobs in other existing businesses. However, the lack of experience and low survival rates mean that some of the new start-ups close in a very short period of time, which would limit the reduction of unemployment. However, the unemployed tend to have lower endowments of human and social capital and entrepreneurial talent, which can lead to early retirement. High unemployment may also involve lower levels of personal wealth reducing the likelihood of becoming self-employed.

Review of the Empirical Literature

Different aspects of the "refugee effect" and the "Schumpeter effect" have been discussed and evaluated theoretically and empirically in a masses of researches (Evans and Leighton, 1990; Alba-Ramirez, 1994; Audretsch and Thurik, 2000; Audretsch and Als, 2002, 2005; Ritsila and Tervo, 2002; Baptista and Preto, 2007; Glocker and Steiner, 2007; Faria et al. 2010; Fairlie 2011; Yu et al. 2014; Aubry et al. 2015). Available empirical studies present similar ambiguities and reflect these two contradictory theories. Some studies have shown that unemployment is associated with growing entrepreneurial activities while others have found that entrepreneurial activity and unemployment are inversely proportional (Thurik, 1999). Evans and Leighton (1990), for example, found that unemployment is positively associated with start-ups of new firms, whereas Garofoli (1994) and Audretsch and Fritsch (1994) found that unemployment is negatively related to self -employment.

On the other hand, Carree (2002) found no statistically significant relationship between unemployment and the number of establishments. In his empirical discussion of the unemployment rates and the start-up activity of new firms, Storey (1991) closes that: "The general consensus is that time series analyses indicate that unemployment is positively associated with the indices of formation of new Companies, while cross-sectional or pooled cross-sectional studies suggest the opposite." Audretsch and Thurik (2000) presented empirical confirmation that increasing the number of business owners diminishes the unemployment rate. They determine an "entrepreneurial effect" for the positive impact of entry of new firms on employment.

In their study about the United States, Highfield and Smiley (1987) found that the increase of the unemployment rates is associated with an increase of the rate of new business creation. In his study about Spain and the USA, Albo-Ramirez (1994) shows that the duration of unemployment increases the likelihood of becoming self-employed. On their part, Evans and Leighton (1990) report that self-employed workers are more likely to lose their jobs than employees. In their analysis of 23 OECD countries for the period 1974-1994, Audretsch and Thurik (2000) found that the movement towards entrepreneurial activities in the economy leads to a fall of the unemployment rate. They pointed out

that "the growth of the number of entrepreneurs leads to a reduction of the unemployment rate" (Audretsch and Thurik, 2000).

In another study, Picot et al. (1999) found a weak negative relationship between self-employment and unemployment in Canada. However, Blanchflower and Oswald (1998) found negative effects of the local unemployment rate on self-employment. Blanchflower (2000) found a negative relationship between the self-employment rate and the unemployment rate for most OECD countries. Thurik, et al. (2008) analyzed the dynamic relationship between self-employment and unemployment rates for a panel of 23 OECD countries for the period between 1974 and 2002. They found evidence of both the "refugee effect" and the "entrepreneurial effect" and find that the "entrepreneurial effect" is stronger than the "refugee effect".

Therefore, there are no only theoretical reasons, but also empirical evidence that unemployment leads to an increase of self-employment while self-employment leads to the reduction of unemployment. Unraveling the relationship between self-employment and unemployment is essential as policy is often based on assumptions that should not reflect ambiguities. The purpose of this paper is to try to resolve the ambiguities found in the relationship between unemployment and self-employment.

Empirical Analysis

We will concentrate on the relationship between unemployment and self-employment in Tunisia during the period 1980-2015. Our variables are as follows: UR represents the unemployment rate and SE represents self-employment. UR is taken from IMF (2017) while SE is taken from WDI (2017).

Estimation Techniques
Stationarity Test

The first stage of the econometric analysis is the study of the stationarity of the two time series UR and SE. To make the two series stationary, we use the Augmented Dickey-Fuller (ADF) test. Although the ARDL cointegration technique does not require all the variables to be I(1), it remains important to verify that not all the variables are I(2). The critical F-statistical values computed by Pesaran et al (2001) and Narayan et al (2005) are based on the assumption that all the variables are I(0) or I(1). The results of the ADF test are shown in Table 1 below and show that UR is I(1) and SE is I(0) at 5% threshold.

Table 1: Augmented Dickey-Fuller test

	ADF Statistic	
	In level	In first difference
UR	-2.735061	-6.872384**
Critical value 5%	-2.948404	-2.951125
Critical value 10%	-2.612874	-2.614300

	ADF Statistic
	In level
SE	-3.266635**
Critical value 5%	-2.948404
Critical value 10%	-2.612874

** denote the significance at the threshold of 5% respectively.

The ARDL Cointegration Technique

In this study, we use the ARDL cointegration approach to examine the long-term cointegration relationship between the unemployment and self-employment rates. The ARDL cointegration procedure was introduced by Pesaran and Shin (1999) and then extended by Pesaran et al. (2001).

Compared to the cointegration methods, the ARDL cointegration approach has some advantages. On the one hand, and contrary to other cointegration techniques, it does not impose the hypothesis according to which all the variables come from the same order of integration. In other words, this cointegration approach can be applied even if the variables are I(1) or I(0). On the other hand, it is not sensitive to the sample size but is considered more appropriate for a limited number of observations. The ARDL model used in our analysis is expressed as follows:

Case 1: UR is the endogenous variable

$$\Delta UR_{t} = \beta_0 + \sum_{i=1}^{n} \beta_{1i} \Delta UR_{t-i} + \sum_{i=1}^{n} \beta_{2i} \Delta SE_{t-i} + \beta_3 UR_{t-1} + \beta_4 SE_{t-1} + \mu_t \quad (1)$$

Case 2: SE is the endogenous variable

$$\Delta SE_{t} = \alpha_0 + \sum_{i=1}^{n} \alpha_{1i} \Delta SE_{t-i} + \sum_{i=1}^{n} \alpha_{2i} \Delta UR_{t-i} + \alpha_3 UR_{t-1} + \alpha_4 SE_{t-1} + \mu_t \quad (2)$$

With μ_t is the white noise error term and Δ is the first difference operator. The null hypothesis of non-cointegration in equation (1) states that (H0: $\beta_3 = \beta_4 = 0$) against the alternative hypothesis (H1: $\beta_3 \neq \beta_4 \neq 0$). The null hypothesis of non-cointegration is verified when (H0: $\alpha_3 = \alpha_4 = 0$) against the alternative hypothesis (H1: $\alpha_3 \neq \alpha_4 \neq 0$).

Pesaran and Pesaran (1997) and Pesaran et al. (2001) have fixed for each level of significance two classes of critical values relative to the lower and upper bounds, corresponding to the case where the variables are I(0) and I(1), respectively. If the calculated statistical value is higher than the upper bounds, hypothesis H0 is rejected and the presence of a long-term cointegration relation is confirmed. However, if the calculated statistical value is lower than the lower bounds of the ARDL test, hypothesis H0 is validated, hence the absence of a long-term cointegration relation. However,

if the calculated statistical value is between the two bounds, in this case the cointegration test is judged to be inconclusive and therefore we cannot be interpreted.

The long term relationship between UR and SE is examined using the ARDL cointegration procedure. The first step is to determine the number of delays in equations (1) and (2) based on the Akaike Information Criterion (AIC) and the Schwarz Criterion (SC). Table 2 below shows the optimal number of delays according to the two criteria mentioned above. The optimum number of delays detected corresponds to a delay. The second step is to apply the ARDL bounds value test for equations (1) and (2) in order to detect the existence of long-term relationships between the studied variables. Once one or more long-term relationships are determined, the third step is to estimate this cointegration relationship (see table 4).

Table 2: Determination of the optimum number of delays

	AIC	SC
0	7,832	7,922
1	7,187*	7,459*
2	7,257	7,711
3	7,385	8,020

*denote the significance at the threshold of 10%

Table 3 Detection of the long-term relationship

Case 1: UR is the endogenous variable

Variable with trend and constant	Nombre of lag length	F-statistic	probability	result
UR endogenous	1	5,975*	0,036 (5%)	cointegration

Asymptotic critical values	1%		5%		10%	
	I(0)	I(1)	I(0)	I(1)	I(0)	I(1)
36	7,593	8,350	5,377	5,963	4,427	4,957

Case 2: SE is the endogenous variable

Variable with trend and constant	Nombre of lag length	F-statistic	probability	result
SE endogenous	1	5,982**	0,022 (5%)	cointegration

Asymptotic critical values	1%		5%		10%	
	I(0)	I(1)	I(0)	I(1)	I(0)	I(1)
36	6,027	6,760	4,090	4,663	3,303	3,797

The asymptotic critical values are obtained from Narayan (2005), p. 1987.

Table 4 Estimation of the long-term relationship

Case 1: UR is the endogenous variable

UR endogenous	coefficient	significance
Constant	4,8245**	5%
SE	-0,0774**	5%

R2 = 0,709

Case 2: SE is the endogenous variable

SE endogenous	coefficient	significance
Constant	1,30702**	5%
UR	0,0916*	10%

R2 = 0,709

Interpretation of the Estimation Results

According to the results presented in table 4, the effect of unemployment on self-employment is found to positive and significant. We can therefore say that the increase of the unemployment rate leads to the increase of that of self-employment. This shows that the "refugee effect" is verified in Tunisia. Actually, table 4 shows that the effect of self-employment on unemployment is negative and significant. This suggests that an increase in self-employment rate logically leads to the decrease of the unemployment rate. Indeed, both the "entrepreneurial effect" and the "refugee effect" are verified in Tunisia. On the other hand, a solution that can be applied to reduce unemployment in Tunisia is self-employment. For this reason, policies should be directed towards encouraging private investment to be able to control the rise of unemployment in Tunisia, especially after the 2011 revolution.

Conclusion

The objective of this article was to test the existence of the "refugee effect" and the "entrepreneurial effect" in the case of Tunisia. This objective was achieved through the use of the technique of Pesaran et al. (2001) about the co-integration of the ARDL approach.

Moreover, our work provides new evidence on the relationship between self-employment and unemployment. The results revealed that there is a bi-directional relationship between these two variables in the case of Tunisia. In fact, Tunisia supports positive impact of unemployment on self-employment and supports negative impact of self-employment on unemployment. This suggests that increasing unemployment will stimulate the start-up of new firms. This start-up of new company will subsequently lead to the reduction of the unemployment rate. We have thus verified the "refugee effect" and the "entrepreneurial effect" in the case of Tunisia. Nevertheless, Tunisia should offer other incentives for entrepreneurship to control the rising unemployment and achieve sound and sustainable economic growth.

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