Disconnection between the Financial Sphere and the Real Sphere: Theoretical Foundations and Empirical Investigation

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Abstract
Although several studies of theoretical and empirical ones converge on the financial dimension in economic growth, they do not actually provide real common response to the problem of the possible interaction between the real economy and the financial. In fact, the interrelationship between financial development and economic growth arises more acutely and becomes increasingly uncertain to know is that the financial activity that stimulates real or vice versa. Who rightly, Schumpeter argues that: "Financial institutions are required to technological innovation underlying growth" or Robinson says, "Where growth leads; finance follows. »The question posed in this article question then is at the intersection of two areas, namely finance and economics. We will be interested throughout this research to the Tunisian context by using a methodology that is first to apply the test cointegration between the rate of return on equity and the rate of growth in economic activity real. While in second place, we will adopt the technique of error correction (VECM) to be considered in order to understand the dynamics between the variables studied in the short and long term. Finally, the causality test will be the third step of our methodology to detect the direction and magnitude of the causal relationship between the two spheres studied.
Keywords: Real Sphere, Financial Sphere, Disconnection, Causality, Cointegration, VECM

Introduction

The relation treated between development of financial activity and economic growth made the object of a very controversial debate of economic history. The fact remains that major difficulty tied to these problems domiciles mainly in the highlighting of the sense of causality between these two dimensions to specify if finance is the driving sector of economic growth or if it is simply about a result of economic performances; is therefore what is reason and which is effect??

Traditionally, the Keynesian school supports hypothesis that the development of the financial sphere results completely from economic growth what lets predict that finance resides as being a true endogenous answer to the request expressed by the economic agents from this perspective. Other visions; such of Robinson (1979); recommend an ambiguous

relation between the financial sphere and that real by adding that during the initial state of development exchange of which is not organized yet; economic growth is of rather weak largeness. In fact, the more national income augments, the more financial structures become established progressively and by consequences, economic growth becomes more speeded up. At the level of this stadium of maturity, we differentiate an economy which has financial structures of a stable system of sharing out of incomes which procreates a higher growth rate in comparison with the initial stadium. Since then, the more the financial sphere is developed thanks to economic growth, the more this last is likely to develop finance.

Given that finance is a particular area of economy, therefore any stock exchange fluctuations can be partly explained by those economic: it is for this reason; we cannot be unaware of the impact of the real sphere on the financial sphere in sense that anticipations of Stock Exchange prices reflect anticipations of fundamental economic. So, any anticipation will be forcing linked to the visions of the markets of point of view economic growth: let be the financial market is considered as being an advanced indicator of economy. It follows therefore that it is possible to explain the erratic fluctuations of Stock Exchange prices via the study of the movements of the economic indicators. Moreover, financial markets during these last years were shaken by many speculative incidents and financial crises.

Literature Review
Links between financial activity and real economic activity

The recent crisis has given new impetus to efforts to include the importance of the financial sector in macroeconomic models (Borio, 2011). Recently, the literature has focused on changes in the monetary transmission mechanisms. It assumes that monetary conditions affecting the real sector by affecting the financial conditions that have direct links to economic behavior. Boivin *et al* (2009); Gertler & Karadi (2010) who conducted a study of unconventional monetary policies they incorporate integrated financial intermediaries. Gertler & Kiyotaki (2010); Christiano *et al* (2011) studied the influence of the financial sector in the development of the economic cycle. Our work is also closely related to a literature that remains at the heart of the issue of financial stability (Bordo *et al*., 2000; Illing & Liu, 2006; Hollo *et al.*, 2012; Hatzius *et al.*, 2010).

Several explanation were moved forward where they called the macroeconomic factors, we differentiate principally jobs of Balke and Wohar (2001); Carlson and Thinks (1997); Heaton and Lucas (2000); Kopcke (1997); Mc Grattan and Prescott (2000) and others who aim at clarifying phenomenon of this crack. Another shutter of research works such as those of Binswanger (1999,2000 and 2004) and Shiller support hypothesis that any recent variations of the prices of actions is not explained by the fundamental macroeconomic factors; in fact these jobs suggest another explanation of these erratic movements of stock exchange outputs: the speculative exogenous bubbles or else irrational exuberance[1]. Are by examining papers of Binswanger [2000,2004][2] which examined the speculative incidents and the role played by real activity in the explanation of financial activity in American context, the author deducted an independence between stock exchange outputs and real economic activity where from the violation of a property which was traditionally accepted in classical

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[1] « Irrational exuberance» is an expression used by the ancient representative of EDF, Alan Greenspan, in a speech given in front of the American Enterprise Institute during the Internet bubble of 1990s. This expression was a bet in guard against a probable overvaluation of the market of actions. "Wikipédia".

[2] "How important are fundamentals?-Evidence from a structural VAR model for the stock markets in the US, Japan and Europe". International Financial Markets Institutions. and Money, 14 (2004) 185–201.

literature. Indeed, this conclusion drove subsequent research jobs towards another alternative with the intention of explaining the variations of stock exchange outputs, by surpassing itself the model of the value updated of cash flows futures. This model which considers real economy (real sphere) as a variable which causes and explains financial activity (financial sphere): in this respect, we underline jobs of Fama (1990) which were at the origin of interpretations and of new explanation suggested by Binswanger [on 2000, 2004 old] which introduce the speculative bubbles or the fads as the main determiners of any break between both appraised spheres.

We also underline another wave of research works which aim at explaining beforehand these recent stock exchange fluctuations via an analysis concerning the stock prices which generate significant information on the economic growth rate. As part of the model of actualization or of the cash flows futures (dividends are), we assume that the price of action is an indication which must reflect forcing any anticipations formulated by the different actors gift on the financial market; the investors are particularly; concerning future real economic activity. Explanation was moved forward in this frame which proves appraised pronunciation, since then, economic literature measures real economic activity by industrial production or GDP by considering these aggregates as being of proxies of the benefits of firms. We deduct from it a strong correlation between Stock Exchange prices and real activity due to the fact that the indications of financial activity are constructed when all is said and done on the basis of anticipations of economic activity as part of the real sphere. We can say that Stock Exchange prices have to reflect real economic activity: hypothesis which will be tested as part of our research work within the limits of paradoxes determined between what was postulated on theoretical plan and empirical official reports. We differentiate several empirical studies which were led on the different international financial markets to examine appraised problems better; we differentiate mainly the study of Binswanger [on 2000, on 2004] which was accomplished on the countries of G7[3]: it is a study which consists in analyzing relation between the real sphere and the financial sphere by carrying link out between the rate of output of actions and the economic growth rate real :l' hypothesis of disconnection between the real sphere and the financial sphere was confirmed as part of American financial market and countries G7 (Binswanger, 2004).

Hypotheses

The objective in this section is to identify factors that explain the real economic activity. The study of the mechanisms of the relationship between the real economy and the financial is largely motivated by the succession of financial crises in the financial sector from the late 1980s. In this regard, we perform a variety of tests to verify the relationship between economic growth and financial activity with the following your assumptions:

H (1): There is a permanent disconnect between the real economy and the financial.

H (2): The financial activity does not Granger cause real economic activity.

Methodology of Econometric Analysis & Data

On the way, we are going to be interested throughout this research work in Tunisian context by making appeal in a methodology which consists above all in applying the test of cointegration between the rate of output of actions and the growth rate of real economic

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[3] A group of debate and of economic partnership of seven countries among most economic Great Powers of the World: The United States, Japan, Germany, France, the United Kingdom, Italy, Canada.

activity[4]. While secondly, we will adopt the technology of correction of errors (VECM) which will be envisaged with the intention of surrounding dynamics between variables studied in court and long-term. Finally, the test of causality is going to make the object of the third stage of our methodology to discern sense and largeness of the relation of causality between both studied spheres. As part of this empirical study led on the case of Tunisia, we are going to keep; always in napierian logarithm, the variables which serve for putting the emphasis on phenomenon studied to know the outputs of stock exchange indication TUNINDEX (variable translating the rate of real output of actions) and the growth rate of the gross domestic product GDP (indicator of real economic activity) for an annual frequency spreading out from 1962 to 2011. But of bonus aboard, he remains useful to make sure of the stability of variables and of absence of cointegration between parameters bets in force to avoid any fallacious decline.

Application of the augmented Dickey Fuller test ADF

Before exploiting the test of cointegration, it will be useful and judicious to examine the notion of stability of series studied to treat better the phenomenon of disconnection between the real sphere and the appraised financial sphere. On the way, the results which we reached, via the test of augmented Dickey-Fuller (ADF) notices that series in logarithm of GDP (Gross domestic product) as well as of stock exchange indication TUNINDEX are not stationary in level seen the presence of an unit root therefore them introduce an order of unit integration; that is I (1); or stationary in first difference.

Table 1
ADF test of the logarithm of the GDP

ADF test of the logarithm of the GDP in level				
ADF Test Statistic	-1,411035	1% Critical Value*		- 2,616203
		5% Critical Value		- 1,948140
		10% Critical Value		- 1,612320
ADF test of the logarithm of the GDP in first difference.				
ADF Test Statistic	-7,178201	1% Critical Value*		- 2,616203
		5% Critical Value		- 1,948140
		10% Critical Value		- 1,612320
*MacKinnon critical values for rejection of hypothesis of a unit root				

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[4] The interest granted near Johansen and Juselius (1990) is; above all; to test the existence of one or several relations of cointegration between series studied on the contrary of technology in two stages postulated by Engel-Granger who allows having only an only relation of cointegration. Secondly, we differentiate advantage which the procedure of Johansen allows us to tell the problems of simultaneity unaware of hypothesis of éxogènéité of variables where it is not necessary any more to impose restrictions on parameters estimated as part of the study of short-term relation. Therefore this technology of Johansen; considered to be a multi-various test; the number of relation or vectors of cointegration of examined series allows us to work out and to analyze.

The series of the GDP in logarithm which represents real economic activity is not stationary in level while it is stationary in first difference: or therefore we can deduct from it that the logarithm of the GDP is included of unit order I (1).

Table 2
ADF test of the logarithm of the Real Price

ADF test of the logarithm of the Real Price in level				
ADF Test Statistic	-1,758908	1%	Critical Value*	- 3,571310
		5% Critical Value		- 2,922449
		10%	Critical Value	- 2,599224
ADF test of the logarithm of the Real Price in first difference.				
ADF Test Statistic	-8,172367	1%	Critical Value*	- 3,574446
		5% Critical Value		- 2,923780
		10%	Critical Value	- 2,599925
*MacKinnon critical values for rejection of hypothesis of a unit root				

Also, we can judge the series of the logarithm of real price am not stationary in level because the statistics calculated according to the test of augmented Dickey-Fuller is superior to that tabulated (are in a 1 % threshold; 5 % and 10 %) while it is stationary in first difference (Or $t_{cal} \prec t_{tab1\%;5\% \, et10\%}$): by consequence we can deduct from it its order of integration which is equal to one I (1).

Application of the Tests of Cointegration

Having stationeries appraised series, we are secondly going to have recourse to the application of the test of cointegration between both variables studied to test the existence of a stable relation of long term between two not stationary variables while including variables of delays and exogenous variables what can allow us to identify true relation apparently between two parameters: the technology of Johansen is the most using which includes a vector of specification into correction of introducing error k delays of following form:

$$\Delta y_t = \alpha + \beta x_t + \pi y_{t-1} + \sum_{i=1}^{k-1} \eta_i \Delta y_{t-i} + \varepsilon_t$$

(1)

With y_t a vector of order (2×1) is variables included by order 1.

On the way, the results of the application of the test of cointegration in the sense of Johansen are brought back in the table 3.

Table 3
Cointegration in the sense of Johansen

	Likelihood	5 Percent	1 Percent	Hypothesized
e	Eigenvalue	Ratio	Critical Value*	Critical Value**	No. Of CE(s)
	0,325082	3,919596	15,49471	22,81857	None
	0,078933	0,0836126	3,841460	3,946690	At most 1
*(**) denotes rejection of the hypothesis at 5%(1%)significance level				
LR rejects any cointegration at 5 % significance level				

Results found in the existent of the application of the test of cointegration postulate rejection of hypothesis of cointegration between both implemented series where from this absence of cointegration can manifest a lasting disconnection between the financial sphere and that real. In this sense, we can refer to jobs worked out by Binswanger [on 2000, 2000a] when it was a matter to examine this relation as part of American economy as well as other savings of G7. Official reports and interpretations led as part of our research work support furthermore what was confirmed for other savings. To refine advantage the econometric analysis worked out to assess relation between financial and real activity, it is necessary to call a decline of the slightest ordinary squares as well as a mechanism of correction of errors. In fact, the test of decline by MCO has as objective to make depend the growth rate of the aggregate reflecting real economy (that is GDP) of past and current stock exchange outputs. The order of delay of stock exchange outputs adapted will be determined via the criterion of minimization of the Akaike Information Criterion:

$$g_t = \lambda + \sum_{k=0}^{K} \delta_k TUINIDEX_{t-k} + \varepsilon_t$$

(2)

Table 4
Result of regression OLS

Variable	Coefficient	Standard deviation	t-statistic	Prob
C	4,701847	1,425400	3,298616	0,0019
LOG [D(R)]	-0,000856	0,001400	-0,611270	0,5440
LOG [D(R (-1))]	0,000430	0,001356	0,317246	0,7525
R-squared =0,032405				
Adjusted R-squared=-0,009664				
Durbin-Watson= 1,976915			Prob (F-statistic)	0,468763

The test of decline MCO lets predict the absence of a significant relation between the rate of economic growth in real term and current financial activity and passed what always coincides with results coming from the test of cointegration. Moreover, we can underline from the picture above a very weak explicative power of the even negative model a significativity total weak of the model [Prb (F-statistic) =0.468763] of which we also differentiate.

At this stadium, we are going to adopt another technology which consists in modeling the necessary adjustments driving to a situation of balance of long term. This last allows specifying a real link between studied variables: let be the model with correction of error. It is about a dynamic model which makes include short-term dynamics and of long term at the same time. We differentiate the model officially with correction of error for two cointegrated variables X_t and Y_t:

$$\Delta X_t = \gamma_1 z_{t-1} + \sum_i \beta_i \Delta X_{t-i} + \sum_j \lambda_j \Delta Y_{t-j} + d_1(L)\varepsilon_{X_t}$$
(3)

$$\Delta Y_t = \gamma_2 z_{t-1} + \sum_i \alpha_i \Delta X_{t-i} + \sum_j \delta_j \Delta Y_{t-j} + d_1(L)\varepsilon_{Y_t}$$
(4)

Where: ε_{X_t} and ε_{Y_t} is two white noise.

$z_t = X_t - aY_t$: Residue of the relationship of cointegration between X and Y.

γ_i ; (i=1; 2): Force of recall towards the long-term target (given by the relation of cointegration).

It is to note that the phenomenon back in balance is proved only if γ_i is strictly negative $(\gamma_i \prec 0)$ and $|\gamma_1| + |\gamma_2| \neq 0$. In fact, the model with correction of error is going to allow us as part of our problems to make include short-term dynamics at the same time (that is variables in first difference) and the long-term dynamics (represented by the residue of the relation of cointegration): the application of this econometric approach lets predict the following results pointed out in the table [5].

With regard to this output, it proves to be that results exploited by the model with correction of errors are in harmonization with the wave of conclusions deducted by the previous tests due to the fact that the coefficients of stock exchange output in real term (R_t) are not significant in smoothing in the decline of the growth rate of the GDP and conversely. Also, stock exchange outputs cannot be explained by economic growth entirely because none of coefficients is significant. Besides, the coefficients of force of recall towards the long-term balance γ_i are every inferior in zero. So their sum is equal in $0.656 \neq 0$: this can be to interpret by the existence of a possibility back in balance.

Application of the Test of Causality

On theoretical plan, we go about things to head with the relations of causality between economic variables to refine advantage the previous interpretations due to the fact that the highlighting of these causative relations gives elements of reflexion advantageous for a better understanding of economic phenomena. While practically, the knowledge of largeness and sense of causality is imperative as part of the formulation of a correct economic policy.

Granger (1969) offered the concept of causality and of heterogeneity. Variable X_{1t} is reason of X_{2t} ; if the predictability of is improved when relating information in is incorporated in the analysis.

The model is VAR (k) for which variables X_{1t} and X_{2t} are stationary.

$$\begin{bmatrix} X_{1t} \\ X_{2t} \end{bmatrix} = \begin{bmatrix} a_0 \\ b_0 \end{bmatrix} + \begin{bmatrix} a_1^1 & b_1^1 \\ a_1^2 & b_1^2 \end{bmatrix} \begin{bmatrix} X_{1;t-1} \\ X_{2;t-1} \end{bmatrix} + \begin{bmatrix} a_2^1 & b_2^1 \\ a_2^2 & b_2^2 \end{bmatrix} \begin{bmatrix} X_{1;t-2} \\ X_{2;t-2} \end{bmatrix} + \cdots + \begin{bmatrix} a_k^1 & b_k^1 \\ a_k^2 & b_k^2 \end{bmatrix} \begin{bmatrix} X_{1;t-k} \\ X_{2;t-k} \end{bmatrix} + \begin{bmatrix} \varepsilon_{1;t} \\ \varepsilon_{2;t} \end{bmatrix}$$

(5)

Where :   t : Time Index.

a_i^j : The coefficients associated with a vector autoregressive matrices VAR.

$\sum_t \left(\varepsilon_{1;t} ; \varepsilon_{2;t} \right)$: Vector error term uncorrelated.

a_0 And b_0 : constants.

The determination among delays (k) is performed by criteria AIC and SC in a system of two equations. Is:

$$\begin{cases} X_{1;t} = a_0 + \sum_{i=1}^{k} a_i^1 X_{1;t-i} + \sum_{j=1}^{k} b_j^1 X_{2;t-j} + \varepsilon_{1;t} \\ X_{2;t} = b_0 + \sum_{i=1}^{k} a_i^2 X_{1;t-i} + \sum_{j=1}^{k} b_j^2 X_{2;t-j} + \varepsilon_{2;t} \end{cases}$$

Consider the following assumptions:

X_{2t} Does not cause X_{1t} if H_0 is accepted.

$H_0 : b_1^1 = b_2^1 = b_3^1 = \ldots\ldots = b_k^1 = 0$

X_{1t} Does not cause X_{2t} if the following hypothesis is validated.

$H_0 = a_1^2 = a_2^2 = a_3^2 = \ldots\ldots\ldots = a_k^2 = 0$

On the light of results brought back in the tables 5 and 6 we note in this respect that the no hypothesis according to which the indicator of real economic activity GDP (real sphere) does not cause stock exchange indication TUNINDEX (financial sphere) is accepted for a number of delays p=2. Indeed, linked likelihood is in the order of 99,50 %; is widely superior at the beginning of significativity of 5% where from we can deduct from it that real activity does not cause financial activity in Tunisia and by consequences; a disconnection very demonstrated in this sense between the real sphere and that financial.

Table 5

Investigation of the relationship between stock returns and GDP growth [VECM]

Standard errors & t-statistics in parentheses		
Error Correction :	D[log(g)]	D[log(r)]
CointEq1	**-0,630385**	**0,028976**
	(0,22000)	(0,01536)
	(-2,86542)	(1,88674)
D[log(PIB(-1))]	-0,196882	-0,015223
	(0,18299)	(0,01277)
	(-1,07593)	-(1,19174)
D[log(PIB(-2))]	-0,030879	0,003000
	(0,14125)	(0,00986)
	(-0,21861)	(0,30428)
D[log(Tunindex(-1))]	-8,989142	-0,207810
	(4,10210)	(0,28636)
	(-2,19135)	(-0,72570)
D[log(Tunindex(-2))]	2,421666	-0,182655
	(3,29463)	(0,22999)
	(0,73503)	(-0,79418)
C	0,194860	-0,032706
	(0,48728)	(0,03402)
	(-0,39990)	(-0,96148)
R-squared	0,577542	0,364651
Adj. R-squared	0,526023	0,287169
F-statistic	11,21022	4,706290

Table 6

Testing Granger Causality between stock returns and GDP growth

Null Hypothesis	Obs	F-Statistic	Prob
LnTUNINDEX does not Granger cause LnGPD	48	0,00499	0,9950
LnGPD does not Granger cause LnTUNINDEX		1,02155	0,3686

In this respect, the examination of the relation of causality in sense where financial activity predicts that real will be specified by testing the no hypothesis according to which parameter LN TUNINDEX does not cause that LN GPD. We conclude according to results brought back in the picture 6 that no hypothesis is kept with a 36, 86 % > 5 % what lets predict that the real activity in Tunisia is not supported by financial activity. Graphic representation (graphic 1) confirms of advantage the disconnection pronounced between both studied parameters.
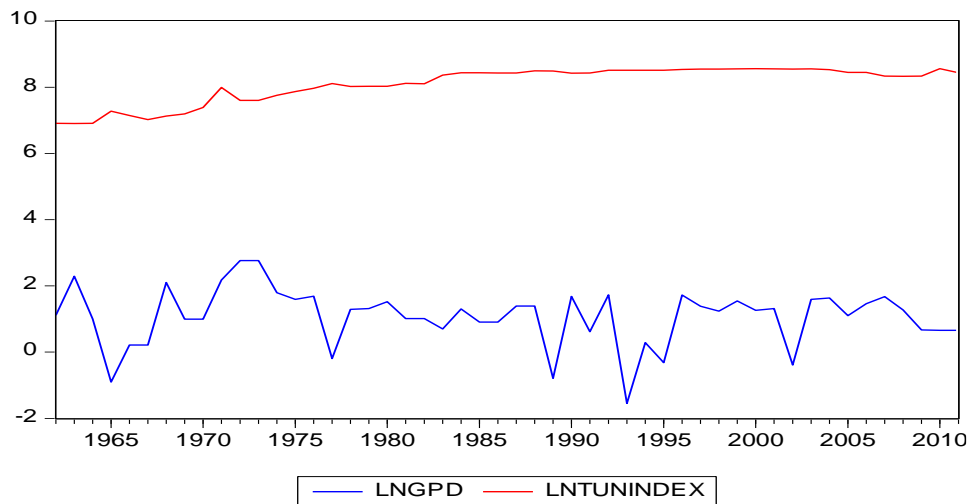
Graphic 1. Evolution of stock returns and GDP growth

Conclusions

The absence of sense of causality in Tunisian context can be allocated in the fact like the financial system adopted in measure that he is rudimentary, strongly managed and still suffering from the absence of a true stock exchange activity without forgetting that the mechanisms of the current financial system thinks still capable of mobilizing savings discounted and of allocate it in an efficient way. This can be explained to a great extent in slowness and laxity of reforms in modernization, in restructuring and in adjustment undertaken by the authorities of Tunisian tutelage in the course of the eighties.

Besides, the disconnection recalled in this research context between real activity and financier deeply recommends that he remains desirable of the economic activity via that financial is not to encourage and aims poured due to the fact that the manipulation of economic growth by financial parameters remains difficult view that:

i. The financial and banking system is vulnerable and unable to satisfy requirements of a politics of healthy financial liberalization.

ii. The complexity of the installation of the reforms which still suffer from lacunas, from laxismes and from simplicity.

By way of conclusion, the disconnection between the real and financial sphere is confirmed well via the technology of correction of errors where from we can deduct from it more than the financial activity in Tunisia is not supported by the real meeting while examining significativity of coefficients. It remains to signal in this research sense that conclusions postulated as part of our study confirm conclusions underlined by Brinswanger [on 2000; 2000a], in the context of its studies led on the American market and other the most industrialized big countries of the group seven (G7).

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