An Empirical Study on the Relationship between Informal Finance and Economic Growth in Wenzhou

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Abstract-Developing informal finance normally and improving the economic ability of financial service for entity is not only essential to the healthy development of Wenzhou, but also has an important exploration significance on national financial reform and economic development. This paper shows the detailed empirical analysis through ADF test, co-integration test and granger causality test, which suggests that the informal financial development in Wenzhou promotes local economy. What's more, there is a stably long-term equilibrium relationship between them. This conclusion has political inspiration significance for us to know the relationship between informal finance and economic development, so that we can explore the reasonable way for economic development from the perspective of the development of informal finance.

Key words-informal finance; economic development; co-integration test

1. Introduction

Informal finance is a commonly financial phenomenon in the world. The rise of informal finance eases the financing difficulties of SMEs and plays an important role in developing economy. The study of Huaihong Diao (2002) showed that informal finance could solve the problems of financing in private economy so that it could promote the economy to grow. Tsai indicated that informal finance accelerated the development of private SMEs, thus it made a miracle of Chinese economic growth since our reform and openness. Xu Wei and Guo Wei (2004) pointed out that informal finance had the effect which couldn't be ignored on the economic growth as a formally financial supplement. The empirical research of Guo Wei (2004) made it clear that informal finance was an important supplement in economic growth. Shi Jincuan (2004) thought that informal finance played an important role in the process of the development of private economy in Wenzhou. Therefore, existing literature made the conclusion through qualitative perspective. And what is the relationship between informal finance and economic growth through quantitative perspective? Does the former promote the latter or the opposite? The answer is here. This paper makes an empirical analysis of the dynamic

relationship between them on the base of their data in Wenzhou, which reaches some significant conclusions and gives pertinently related policy suggestions.

2. The empirical analysis of informal finance and economic growth

2.1 Selection and description of indicators and data

As we all know, the scale of informal finance has underground and hidden features. So we can't obtain accurate statistics of the scale. In the case of the absence of official statistics, scholar calculated the scale of informal finance by relying on theoretical   methods, in addition to get   research data through field survey. For example, Jianjun Li (2010) estimated unobserved credit scale from the point of view of the demand for credit in China. Taking the possibility of data into account, the research indicates that not all but some parts when $0<\theta<1$ of the savings can be turned into investment. So that only partial savings can be turned into investment of private enterprises through informal financial departments. Because of this, we will draw Gexiu Zhu's (2006) informal investment as informal finance, which we can express it with FCT and economic growth with GDP. Then, we conduct quantitative analysis by Eview6.0 statistical software through 31 samples from Wenzhou Statistic Yearbook in 2010.

In order to eliminate the impact of heteroscedasticity in the data of time series, this paper will turn GDP and FCT into their natural logarithm expressed as LNGDP and LNFCT. From picture 1 we can see that two groups of time series data which are LNGDP and LNFCT show a clearly rising trend. If we directly make regression analysis, there may appear the phenomenon of spurious regression. So it is necessary for us to use the difference method when study LNGDP and LNFCT. But the time series after difference method represented as DLNGDP and DLNFCT have no time trend item and constant term. Instead, they level off. We can see that in picture 2.
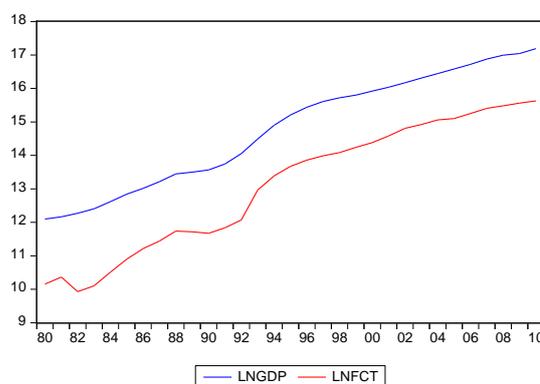
Picture 1: The trend of LNGDP and LNFCT
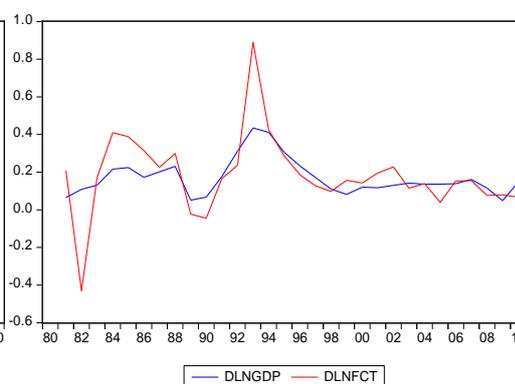
Picture 2: The trend of DLNGDP and DLNFCT

2.2 Stationary Tests of ADF

Table 1 Unit root test results by ADF of LNGDP and LNFCT

Variables	Inspection form (c,t,k)	ADF test value	1% of critical value	5% of critical value	10% of critical value	results
LNGDP	(c,t,2)	−1.444808	−4.323979	−3.580623	−3.225334	Nonststionary
D(LNGDP)	(c,t,1)	−3.343237	−4.323979	−3.580623	−3.225334	Stable
LNFCT	(c,t,1)	−2.077510	−4.309824	−3.574224	−3.221728	Nonststionary
D(LNFCT)	(c,t,0)	−3.738345	−4.309824	−3.574244	−3.221728	Stable

Attention: The characters in test form (c.t.k) respectively represent constant term, trend item and lag intervals for endogenous. D(LNGDP) and D(LNFCT) respectively represent the value of first order difference of LNGDP and LNFCT.

From Table 1 we can see that in 10% of the significant level, the value of ADF of LNGDP and LNFCT are higher than their critical price. So we accept the null hypothesis H0, which shows that the two series both contain unit roots and have no stability. But after difference method, the value of ADF of LNGDP and LNFCT are lower than their critical price in 10% of the significant level, and perform stationary feature. So they all belong to sequence (1).

2.3 Co-integration Test

Through ADF Test, we can find that LNGDP and LNFCT are integrated of order one I (1), which meets necessary conditions of co-integration. In another words, their orders are the same. First, we should create a least-square regression equation of the variable LNGDP and LNFCT.

$$LNGDP = \beta_0 + \beta_1 LNFCT + \mu_t \quad (1)$$

The analysis results are as follows:

$$LNGDP = 3.252878 + 0.880610 LNFCT + \mu_t \quad (2)$$
$$t = (21.02473) \quad (75.33138)$$
$$R^2 = 0.994916$$
$$F = 5674.817 \quad D.W = 1.120620$$

From the above equation we can see that the regression equation has passed the t test and F test, which proves that the independent variable LNFCT has a significant effect on the dependent variable LNGDP. What's more, R^2 is very large which shows that goodness of fit of the equation is very good. In order to further confirm that whether there is co-integratial relationship between variable LNGDP and LNFCT, we still need to have the stationarity test on residual series which is μ_t. We can get the residual sequence μ_t from the equation 1 available

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$$u_t = LNGDP ⏊ 3.252878 ⏊ 0.880610 LNFCT \quad (3)$$

The results after the ADF unit root test on μ_t are shown in Table 2.

Table 2   Results of ADF unit root test for the residual sequence μ_t

Variables	Test Type (c,t,k)	Test Value of ADF	1% of Critical Value	5% of Critical Value	10% of Critical Value	Results
u_t	(c,0,0)	−3.251263	−3.670170	−2.963972	−2.621007	Stable

From Table 2 we can know that the residual sequence u_t has the feature of stability. So we can have the conclusion that there is co-integration relationship between variable LNGDP and LNFCT which is significant positive correlation. So there exists long equilibrium relationship between them. Equation 2 shows that GDP will increase 0.880610 units when informal financial investment FCT increase one unit, which also explains that informal financial investment has the effect of promotion on economic growth in Wenzhou and there is long-term stable relationship between them.

2.4 Granger Causality Relationship Test

After the co-integration test above, we can see that there is long-term stable relationship between LNGDP and LNFCT. However, in order to determine whether there is causal relationship in the long-term equilibrium, we also need to test it with Granger Test. The results are as follows.

Table 3 Granger Causality Relationship Test in second period of lag phase

Null hypothesis	Observation	F-statistic	Value P	Results
LNGDP isn't the Granger reason of LNFCT	29	19.3603	0.1315	Null hypothesis is accepted
LNFCT isn't the Granger reason of LNGDP	29	2.21064	0.01163	Null hypothesis is refused

Test results show that there exist one-way Granger causal relationship between LNGDP and LNFCT. In another words, LNGDP is the Granger reason of LNFCT. But LNFCT isn't the Granger reason of LNGDP. The growth effect caused by informal financial investment in Wenzhou is slightly higher than the confidence level. But the growth of GDP will promote the growth of informal financial investment.

2.5 Short-term Dynamic Relationship Test based on the Error Correction Model

If we regard stable residual sequence μ_t as error correction term, we can get error correct model:

D(LNGDP)= β_0 + β_1 D(LNFCT) + $\beta_3 u_{t-1}$ + ξ_t (4)

Results of estimation are as follows:

D(LNGDP)= － 0.097378 ＋ 0.388881D(LNFCT) － 0.236025   (5)

The estimation results show that: GDP in Wenzhou is not only influenced by the fluctuation of informal financial investment, but also depends on the degree of informal financial investment deviating from the equilibrium level in last period. The estimated coefficient of error correction term is negative, which embodies the correction of deviation. From the equation we can be see that when the short-term fluctuations deviates from the long-term equilibrium, it will be pulled back to equilibrium state by adjustment of -0.236025.

3. Conclusions and Policy Analysis

The empirical analysis above shows that there is a long-run equilibrium relationship between informal finance and economic growth during 1980 and 2010. The co-integration relationship shows that this long-term relationship is positively correlated. In another words, informal finance plays a stimulating role on economic growth in Wenzhou. Granger causal analysis shows that the growth of GDP caused by informal finance is a bit higher than 10% of confidence level, and the growth of GDP will promote the growth of informal investment. Analysis of error correction model indicates that when informal financial investment LNFCT deviates from the long-term equilibrium, error correction model will negatively adjust it toward the equilibrium state.

The conclusion above helps us to better understand the relationship between informal finance and economic growth. Thus, we can explore the reasonable remedy for economic growth as follows:

First, it is necessary to realize the important role of informal finance and take support attitude towards informal finance but not cancel it. According to the evidence above, Wenzhou's informal finance has an undoubted effect on improving local economy. In fact, informal finance cannot be canceled. To adopt a cancellation policy will only make the financial activities transferred from ground to underground. This will definitely increase the risk of informal finance and have an influence on the stability of economy and society. Providing informal finance with stable and clear policy can give informal financial activity confidence. What's more, it provides the government with basis for policy making so that create an good polity environment for the development of informal finance.

Second, encourage and guide the informal financial investment, effectively improved the informal capital development environment. Even though informal financial plays an important role in boosting the economic growth, this kind of effect cannot be amplified blindly, or it may lead to inflation and unreasonable industrial structure. Xiaojing Chao's and Baoping Ren's study shows that government investment may expand the total market and stimulate economic growth, but informal financial investment is the impulsion for sustained economic growth. As a general rule, government investment is mainly to the public products and noncompetitive field; accordingly, the informal financial investment should be more to competitive field. During the Twelfth Five-year plan period, According to the national development strategy to expand domestic demand and conforming to the national industrial policy development tendency, we should encourage to expand informal financial investment, expand market access, support informal finance into the fundamental industry, infrastructure, municipal utilities, and social welfare, financial services, etc. And extend the diversification of informal financial investment channels.

Last, we should also strengthen the supervision of informal finance, create the all-round execute system, and establish informal financial legal system framework. Now informal financial legislation is lag in practice

obviously, and relevant legal rules are also barely seen in the general principles of the civil law, contract laws and other laws. And this exposes the scattered lawmaking defect. Informal financial market regulation also vacancies, lacking of effective supervision of the informal finance will definitely affect the harmonious development of economic society. So it is necessary to make a complete standard informal finance law which is suitable for China's condition, specify informal financial legal status, and guide the informal finance to the orbit of ruling by law.

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Vitae

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