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## The effect of the demand side's confidence on the supply side's confidence: the mediating role of financial stress

### Abstract

This paper provides empirical evidence of how financial stress mediates the effect of the demand side's confidence on the supply side's confidence in the United States. Using monthly data from 1994:M2 to 2012:M5, the time-series regression analyses show that changes in the demand side's confidence positively and significantly predicts the supply's side confidence in the United States. The increased changes in the demand's side confidence forecasts lower financial stress. When changes in financial stress and demand side's confidence included in the regression to predict the changes in supply side's confidence, the demand side's confidence coefficient becomes statistically insignificant but the changes in financial stress coefficient is negative and statistically significant. The findings of this study imply that in a demand-driven economy, health of the financial sector plays a very important role in economic growth and prosperity because stressful financial sector puts downward pressures on businesses resulting in a higher unemployment rate in the economy due to workforce downsizing and freeze of new hire.

**Keywords:** business confidence, consumer confidence, financial stress.

**JEL Classification:** E32, E44.

### Introduction

Asset prices, consumption and welfare can significantly decline when the financial sector is stressful. The theory of financial amplification (Jeanne & Korinek, 2010) posits that a feedback loop exists between decline in asset prices, tightening borrow constraint and decline in consumption when borrowing is subject to constraint which depends on the value of asset. Likewise, this feedback loop is also known as financial accelerator, a mechanism by which declining asset net worth, tightening borrowing capacity, contracting economic activity and falling prices mutually reinforce each other (Jeanne & Korinek, 2010). In a demand-driven economy, the demand (consumer) side's confidence has a significant effect on the confidence of the suppliers (businesses). Many studies have empirically examined the role of consumer confidence in economic growth. Howrey (2001) finds a significant linkage between consumer confidence and real future GDP growth. Bernanke (1993) asserts that the economy can contract if consumers are reluctant to make spending decisions. Furthermore, weak consumer confidence has been empirically documented to have a negative impact on the financial market. Romer (1990) speculates that consumer confidence and the late October 1929 stock market crash are related. Blanchard (1993) provides evidence of the linkage between the early 1990s recession and shocks to consumption. Otoo's (1999) empirically documents a link between consumer sentiment and stock prices. Fisher and Statman (2003) also find that stock market returns are highly associated with consumer confidence. Likewise, Jansen and Nahujs (2003) show that changes in sentiment are correlated with equity returns; Lemmon and Portniaguina (2006) provide

similar results. Moreover, a recent study conducted by Chen (2011) shows that during the bearish markets, weak consumer confidence has a significantly negative impact on the performance of equity markets. In a joint analysis of cross-sectional data, Sum (2012) shows that consumer confidence predicts negative stock returns holding business confidence constant.

The financial sector plays a very important role in the real economy because this sector facilitates various activities including saving mobilization and credit allocation, payment and fund transfer services. The services and products offered by the financial sector are vital to both businesses and consumers; households and businesses can manage risks by holding various financial assets. A sound financial sector should offer market participants opportunities to produce and trade goods and services more cost-effectively with minimum risks. When the financial sector is less stressful, households and businesses can have access to more credit due to credit availability and lower cost of finance, which are key to economic growth and prosperity because credit availability and low cost of finance are desirable conditions for consumption and investment. Nonetheless, deterioration in the health of the financial sector can hurt the real economy. When the financial sector is stressful, businesses, consumers, and creditors become more conservative when it comes to investment, spending, and extending credit (Hakkio & Keeton, 2009). Tightened credit condition can cause the interest rate to rise significantly. Higher cost of capital puts downward pressure on the firms' capital expenditure and investment activities (Gilchrist et al., 2010; Fernandez-Villaverde et al., 2012). The economy can slip into recession if firms reduce their production capacities and delay their investment activities (Bernanke, 1983). Potential layoff and freeze of hiring are direct results of investment delay.

Up to this point, no prior study investigates the mediating role of the stress in the financial sector on the effect of consumer confidence on business confidence. Consequently, it is set up to examine if financial stress mediates the effect of consumer confidence on business confidence in the United States. This study is necessary because little is known about the mediating role of the stress in the financial sector in the effect of consumer confidence on business confidence. The findings of this study add crucial information to the field of financial economics.

## 1. Method and data

Monthly changes of the U.S. business and consumer confidence indices from 1994:M2 to 2012:M5 are

provided by the Global Financial Data database. These business and consumer confidence indices are developed by the Organization for Economic Co-operation and Development (OECD). Details on how these indices are constructed are available at the OECD's website located at <http://stats.oecd.org/>. The monthly changes in the financial stress in the United States are obtained from the Federal Reserve Bank of St. Louis. This study uses time-series OLS regressions (equation (1), (2) and (3)) to empirically document the mediating role of financial stress in the effect of consumer confidence on business confidence. The OLS regression analysis is appropriate and sufficient in modeling the mediating effect.

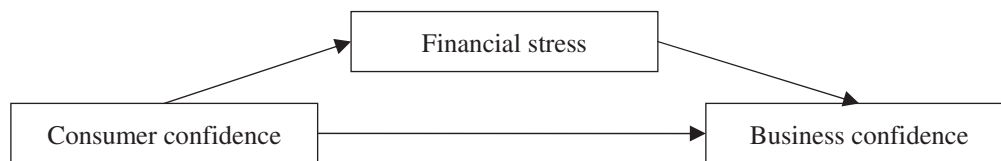


Fig. 1. The mediating effect of financial stress

The mediating effect of financial stress (see Figure 1) exists if and only if the following conditions are met:

1. The coefficients  $\gamma$  and  $\theta$  in equation (1) and (2), respectively, are statistically significant.
2. The coefficients  $\delta$  in equation (3) is statistically significant.
3. The coefficient  $\beta$  in equation (3) is smaller than the coefficient  $\gamma$  in equation (1) and statistically insignificant.

Three sets of hypotheses can be tested to see if the above mentioned conditions are met:

*Null hypothesis 1: Changes in consumer confidence cannot statistically and significantly explain changes in business confidence.*

*Alternative hypothesis 1: Changes in consumer confidence can statistically and significantly explain changes in business confidence.*

*Null hypothesis 2: Changes in consumer confidence cannot statistically and significantly explain changes in financial stress.*

*Alternative hypothesis 2: Changes in consumer confidence can statistically and significantly explain changes in financial stress.*

*Null hypothesis 3: Changes in financial stress, when joined together with changes in consumer confidence as predictors, cannot statistically and significantly explain changes in business confidence.*

*Alternative hypothesis 3: Changes in financial stress, when joined together with changes in consumer confidence as predictors, can statistically and significantly explain changes in business confidence.*

$$\Delta BC_t = \alpha + \gamma \Delta CC_t + \varepsilon_t, \quad (1)$$

$$\Delta FS_t = \alpha + \theta \Delta CC_t + \varepsilon_t, \quad (2)$$

$$\Delta BC_t = \alpha + \beta \Delta CC_t + \delta \Delta FS_t + \varepsilon_t, \quad (2)$$

where  $\Delta BC_t$  is the change in the index of business confidence by taking the first difference; that is the value of business confidence index in month  $t$  less month  $t-1$ ;  $\Delta CC_t$  is the change in the index of consumer confidence by taking the first difference; that is the value of consumer confidence index in month  $t$  less month  $t-1$ ;  $\Delta FS_t$  is the change in the index of financial stress by taking the first difference; that is the value of financial stress index in month  $t$  less month  $t-1$ .

## 2. Results

Table 1 and 2 provide a summary of descriptive statistics and correlations among the variables.

This study uses time-series regressions (equation (1), (2) and (3)) to empirically document the mediating role of financial stress in the effect of consumer confidence on business confidence. The mediating effect of financial stress exists if and only if the following conditions are met:

1. The coefficients  $\gamma$  and  $\theta$  in equation (1) and (2), respectively, are statistically significant.
2. The coefficients  $\delta$  in equation (3) is statistically significant.
3. The coefficient  $\beta$  in equation (3) is smaller than the coefficient  $\gamma$  in equation (1) and statistically insignificant.

As shown in Tables 3 and 4, the results show the coefficients  $\gamma$  and  $\theta$  in equation (1) and (2), respectively, are statistically significant which satisfy the first condition. As reported in Table 3, the consumer confidence coefficient ( $\gamma = 0.15506$ ,  $t = 2.18$ ) is positive and statistically significant at the 5% level indicating that, on average, a unit change in consumer confidence predicts a 0.155 unit increase in business confidence. The consumer confidence coefficient ( $\theta = -0.08610$ ,  $t = -2.18$ ), obtained from running the regression using equation (2), is positive and statistically significant at the 5% level meaning that a unit increase in consumer confidence lowers financial stress by -0.086, on average. In addition, the financial stress coefficient

( $\delta = -0.73530$ ,  $t = -6.59$ ), obtained from running the regression using equation (3) (see Table 5), is negative and statistically significant at the 1% level indicating that a unit increase in financial stress is associated with a 0.735 unit decrease in business confidence. However, the consumer confidence coefficient ( $\beta = 0.09175$ ,  $t = 1.39$ ), obtained from running the regression using equation (3) (see Table 5), is smaller than the coefficient  $\gamma$  in equation (1) and statistically insignificant. The results from the regression analyses using equation (1), (2) and (3) show that the demand's side (consumer) confidence has a positive effect on the supplier's (business) confidence; however, this effect is mediated by financial stress.

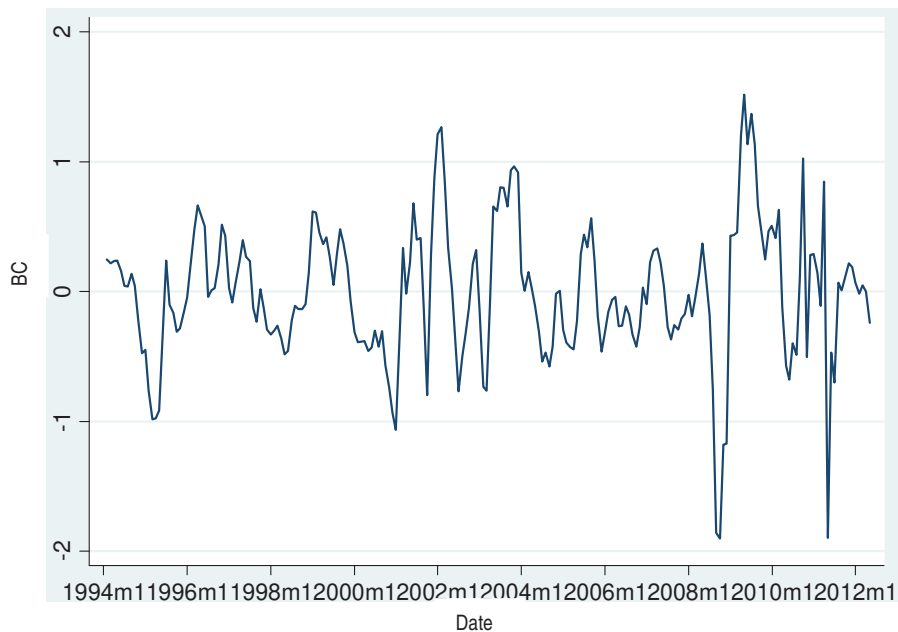


Fig. 2. Changes in business confidence index

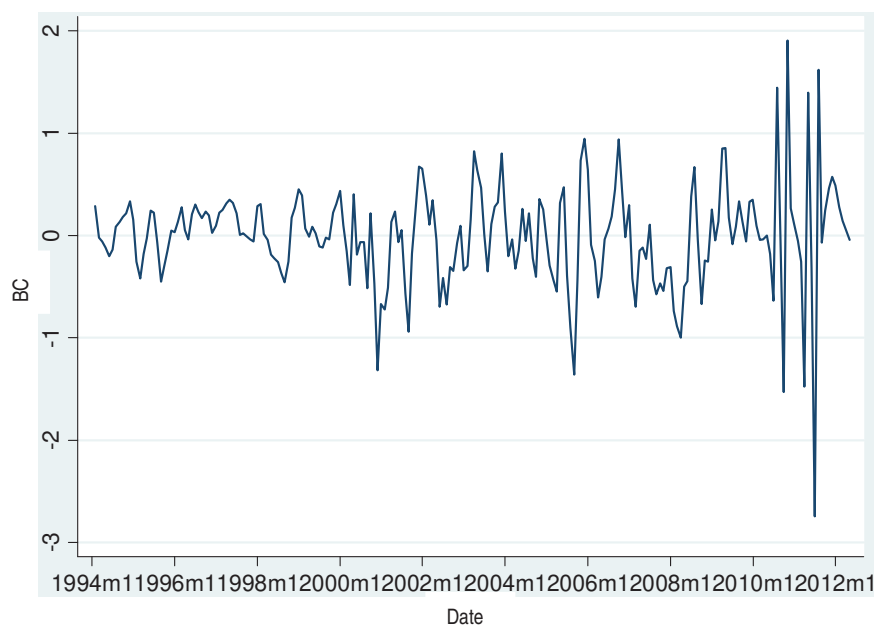


Fig. 3. Changes in consumer confidence index

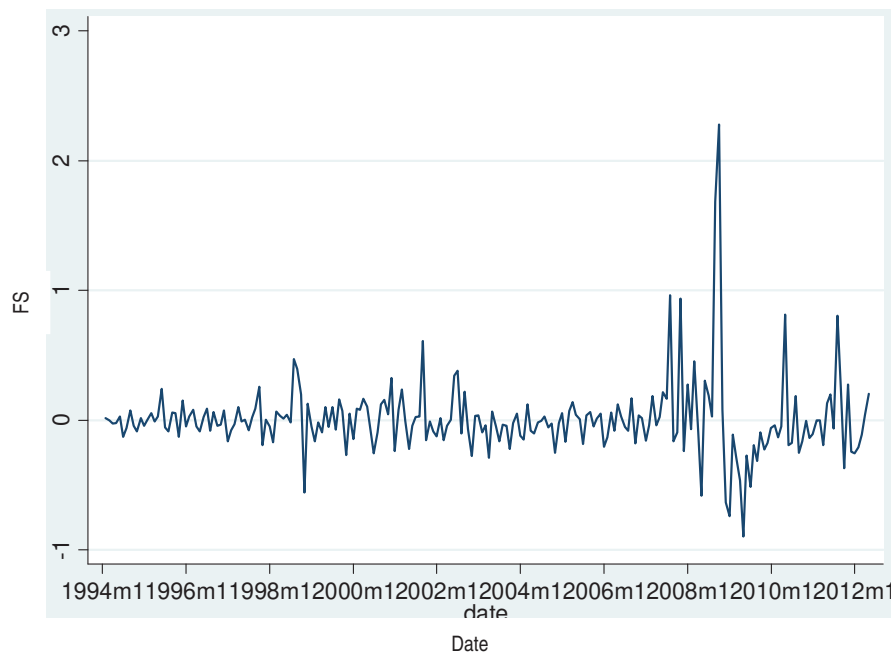


Fig. 4. Changes in financial stress index

Table 1. Descriptive statistics

Variables	Mean	Standard deviation	# of obs.
$\Delta FS$	0.003918	0.293432	220
$\Delta BC$	-0.006186	0.528665	220
$\Delta CC$	-0.011059	0.498077	220

Table 2. Correlations

	$\Delta FS$	$\Delta BC$	$\Delta CC$
$\Delta FS$	1		
$\Delta BC$	-0.4208	1	
$\Delta CC$	-0.1461	0.1461	1

Table 3. Time-series regression results

$$\Delta BC_t = \alpha + \gamma \Delta CC_t + \varepsilon_t$$

	Coefficient	Std. err.	<i>t</i>	Sig.
Constant	-0.00447	0.22009	-0.13	0.899
$\gamma$	0.15506	0.07111	2.18	0.030
<i>R</i> -square	0.0213			
Adj. <i>R</i> -square	0.0169			
<i>F</i> (1, 218)	4.75			0.030

Note: Number of observation = 220; Durbin-Watson *d*-statistic (2, 220) = 1.95.

Table 4. Time-series regression results

$$\Delta FS_t = \alpha + \theta \Delta CC_t + \varepsilon_t$$

	Coefficient	Std. err.	<i>t</i>	Sig.
Constant	0.00296	0.01962	0.15	0.880
$\theta$	-0.08610	0.03947	-2.18	0.030
<i>R</i> -square	0.0214			
Adj. <i>R</i> -square	0.0169			
<i>F</i> (1, 218)	4.76			0.030

Note: Number of observation = 220; Durbin-Watson *d*-statistic (2, 220) = 1.97.

Table 5. Time-series regression results

$$\Delta BC_t = \alpha + \beta \Delta CC_t + \delta \Delta FS_t + \varepsilon_t$$

	Coefficient	Std. err.	<i>t</i>	Sig.
Constant	-0.00229	0.03234	-0.07	0.944
$\beta$	0.09175	0.06578	1.39	0.164
$\delta$	-0.73530	0.11165	-6.59	0.000
<i>R</i> -square	0.1844			
Adj. <i>R</i> -square	0.1768			
<i>F</i> (2, 217)	24.52			0.000

Note: Number of observation = 220; Durbin-Watson *d*-statistic (3, 220) = 2.07.

## Conclusion

Because very little is known about the mediating role of the stress in the financial sector in the effect of consumer confidence on business confidence, it is the problem of this study to investigate if financial stress mediates the effect of consumer confidence on business confidence in the United States. Using monthly data from 1994:M2 to 2012:M5, the time-series regression analyses show that changes in the demand side's confidence positively and significantly predicts the supply's side confidence in the United States. The increased changes in the demand's side confidence forecasts lower financial stress. When changes in financial stress and demand side's confidence included in the regression to predict the changes in supply side's confidence, the demand side's confidence coefficient becomes statistically insignificant but the changes in financial stress coefficient is negative and statistically significant. The findings of this study imply that in a demand-driven economy, health of the financial sector plays a

very important role in economic growth and prosperity because stressful financial sector puts downward pressures on businesses resulting in a higher unemployment rate in the economy due to workforce downsizing and freeze of new hire.

One of the shortcomings of this study is the sample size; there are only 220 observations in this study. A direction for future research is to examine the mediating effect of financial stress using cross-section or panel data.

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