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The effects of liquidity on inventory: Evidence form forestry products subsector in Turkey

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Abstract
As a part of Agriculture sector, forestry subsector is the main provider for the forestry products industry which has been neglected in terms of short-term liabilities and liquidity analysis. Liquidity is a function of the liabilities of the businesses in the short-run and it is expected to consist much of trade credit rather than bank credit. This study tries to reveal the long-term dependence of the short-term inventories on cash and cash equivalents, short-term bank credit used, and short-term accounts receivable as a percentage of short-term liabilities in the forestry products subsector in Turkey. We analyze the sectoral three years averages of aggregate balance sheet data in the long-term (1998 - 2016) and we depict that inventories have correlations with cash and cash equivalents, short-term bank credit and short-term accounts receivable and we also reveal that the sector's short-term liabilities have had a diminishing trend in the very long-run. After introducing the model, we have run the linear regression of the model and we share the robust results of the tests. The findings give evidence that inventories, which are in fact the most illiquid part of the current assets, have bank credit dependency as much as accounts receivable though decreasing liabilities in the short-term. We therefore offer suggestions on the results for the forestry products subsector so as to hedge against the potentially adverse liquidity conditions in the near future. Each precaution held for a subsector will therefore help the sustainability of the forestry and the agriculture sector as a whole and it will also contribute as an example therein integrated especially with the marketing strategies.

Key words: Forestry products subsector, financial analysis, liquidity, inventory, bank credit.

Introduction

Forestry products industry is related to the manufacturing sector. In the literature, there is a lack of short-term liabilities and liquidity analysis on the forestry products subsector. As a function of the liabilities in the short-run for the businesses, liquidity mostly consists of cash and equivalents, accounts receivable, and inventories. Trade credit and bank credit, on the other hand, increase short-term liabilities, and furthermore they could be a source at the same time. This study tries to reveal the dependence of the short-term inventories on especially short-term bank credit used in the forestry products subsector in Turkey along with the relations to accounts receivable and cash. We analyze the sectoral data in the long-term and we depict

that inventories have low degrees of correlations with cash and cash equivalents, accounts receivable, and short-term bank credit, though the sector's short-term liabilities have had a diminishing trend in the very long-run.

We have run the linear regression of the model presented and we offer the robust results of the tests. The findings give evidence on the bank credit dependency of the inventories, which are in fact the most illiquid part of the current assets, as much as accounts receivable. Cash, however, is the most significant independent variable.

The study offers suggestions on the results for the forestry products subsector so as to hedge against the potentially negative liquidity conditions which are potentially ahead in the future with a profound uprising wave of short-term bank credit. Any precaution held for a subsector will therefore help the sustainability of the main providing sectors and such precautions will contribute as a good example to improve the integration of liquidity with the marketing strategies of the firms in these sectors.

Materials and Method

The study uses real sector statistics of the Central Bank of Turkey from 1996 to 2017 as three years aggregate balance sheet averages available from 1998 to 2016 (CBRT, 2018). The data consists of 57 observations for each variable and note that the average data in 1998 is the average of last three years 1996, 1997, and 1998; in 1999 is the average of last three years 1997, 1998, and 1999; and so up to 2016. CBRT data is a set of NACE Rev. II classification including the forestry products subsector. We have analyzed the data of forestry products subsector which informs on a total of 1,749 businesses of all scales for 19 years and an average of 78 businesses for each year within the time span (1998-2016) as series of three years aggregate balance sheet averages to normalize the data. The study uses the data of forestry products industry for the years 1998 to 2009 and from 2010 to 2016 uses three years averages of the aggregate sectoral data of the sector's subtitles (Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials; Manufacture of paper and paper products; Manufacture of pulp, paper and paperboard; Manufacture of products of wood, cork, straw and plaiting materials). The idea beyond the study is the Acid-Test Ratio which has only recently reached the ideal minimum of 1.00 by 2011 after a long cruise of below from 1998 in the subsector. However, this ratio is omitted in the predictors since the independent variable is selected as the short –term inventories. Thereafter, we design and run a linear regression model and related statistical tests using contemporary statistical software. The ***nomenclature*** used in the study is given below:

STL (Short-Term Liabilities)
STI (Short-Term Inventories)
C&CER (Cash and Cash Equivalents Ratio: Cash and cash equivalents as a percentage of STL)
STBC (Short-Term Bank Credit)
STAR (Short-Term Accounts Receivable)
STL/TL (STL as a percentage of Total Liabilities)
ATR (Acid Test Ratio; calculated as (Current Assets – STI) / STL))

Net Working Capital (**NWC**) is the excess part of Current Assets (**CA**) over Current Liabilities (**CL**) in the firms or it can be given as the equation below:

NWC = (CA – CL)
CA = (C&CE + SEC + STAR + STI + OCA)
CL or STL = (STTC + STBC + OCL)
TL = (STL + LTL + EQU)

CL is also called STL (Short-Term Liabilities) and with LTL (Long-Term Liabilities) they form the Total Liabilities or TL of the firms.
C&CE or (Cash and Cash Equivalents) refer to the cash available in the firm and in its bank accounts. The study omits or excludes the SEC (Securities) which are very rare and/or limited in quantity. STAR stands for the Short-Term Accounts Receivable and STI for the Short-Term Inventories available. The liabilities of one year ahead are named as the Short-Term Liabilities (STL). STL consist of STTC (Short-Term Trade Credit) and STBC (Short-Term Bank Credit). Similarly, LTL (Long-Term Liabilities) are the sum of LTTC (Long-Term Trade Credit) and LTBC (Long-Term Bank Credit). EQU refers to the shareholders' Equity. The omitted OCA and OCL stand for Other Current Assets and Other Current Liabilities respectively. The study focuses on the variables of C&CER, STBC, and STAR with their effects on STI for the assumption of the risky and solid nature of the latter variable with a novel model among the net working capital components.

The designed model given below has a Bartlett's test of sphericity significance where the most significant results of 0.000 significance for the regression and sphericity were taken from the model, 81.215 per cent of the cumulative percentage of variance is at the second component level of initial Eigenvalues (Bartlett, 1950). Reliability statistics of all variables included in the test reports 0.60 Cronbach's Alpha and 0.70 Cronbach's Alpha based on standardized items (Cronbach, 1951; Cronbach, 2004) with 0.000 significance between items and 0.001 between residuals for Friedman's Test and Tukey's Test for nonadditivity (Friedman, 1937; Friedman 1939; Tukey, 1949). Then, from the contemporary software (SPSS 22 and Eviews 9) along with other tests, Pearson correlations, inter-item covariance matrix, model summaries and ANOVA results are obtained and reported (Pearson, 1920; Fisher, 1925; Fisher, 1932; Durbin and Watson, 1950; Durbin, 1970; Durbin and Watson, 1971; Kutner et al., 2005). The tests confirming the assumptions of the regression model are Breusch-Godfrey Serial Correlation LM Test for serial correlation (Breusch, 1978; Godfrey, 1978a), Breusch-Pagan-Godfrey heteroscedasticity test for the presence of heteroscedasticity (Breusch and Pagan, 1979; Godfrey, 1978b), and Jarque Bera Test for normality (Jarque and Bera, 1980; Jarque and Bera, 1987). Along with the fundamental analysis, the study then uses post statistical methodology which includes inquiries for spurious regression, unit root and stationary series, co-integration in unrestricted VAR, and causality (Granger, 1969; Granger and Newbold, 1974; Sims, 1980; Engle and Granger, 1987; Johansen, 1988; Johansen, 1995; Levin et al., 2002; Im et al., 2003; Dickey and Fuller, 1979; Fisher, 1932; Phillips and Perron, 1988; Pesaran and Shin, 1998). Further analysis would be forming an error correction model in vectors (Pesaran et al., 2000), however, the study recesses at the causality level. Therefore, the study also reports the results of lag length, group unit root tests at the level of first differences, Johansen cointegration test by an unrestricted cointegration rank test with both trace and maximum Eigenvalues for p values of MacKinnon-Haug-Michelis (1999), and pairwise Granger causality results (Akaike, 1973; Akaike, 1974; Akaike 1979; Schwarz, 1978; Lutkepohl, 1991; Lutkepohl, 2004). The tests report that the series are stationary at the first differences. Using variables as a percentage of STL normalizes the data and increases the comparability among businesses of different scales. The equation refers to the model of the study where STI is taken into consideration as the dependent variable with the

independent variables which are C&CER, STBC, and STAR. The constant is $\boldsymbol{\beta_0}$ and the error terms are $\boldsymbol{\varepsilon_{it}}$. All variables are assessed as a percentage of STL. The equation of the linear regression run is given below:

$$\boldsymbol{Y_{STI\,it} = \beta_0 + \beta_1 x_{C\&CER\,it} + \beta_2 x_{STBC\,it} + \beta_3 x_{STAR\,it} + \varepsilon_{it}}$$

Results and Discussion

The forest industry is among sectors of global importance (Dieter and Englert, 2007), and it has also attractive economic impact and contribution along with the effects on employment in the world (Kupcak and Smida, 2015; Henderson et al., 2017). Being export oriented and innovative are seen as assets (Valimaki et al., 2004) so the circumstances have always been challenging for this sector. In a specific country, the sector could be vulnerable under the negative effects of both local and global economic conditions (Koulelis, 2016) as well. The sector also faces challenges to change for and adopt into new circumstances (Maksymets and Lonnstedt, 2015) for which firm level financial stability is required.

In Turkey, the sector has difficulties within its subsectors, not only with decreasing domestic production which is much dependent on imports (Bayram et al., 2015), but also in terms of the prices of imported raw materials and high cost in its own subsectors (Istek et al., 2017). Thus, we think that a strong liquidity would add much at this point. Liquidity has been assessed by the use of financial ratios in the relevant literature and it has been among the failure indicators for businesses (Beaver, 1966; Altman, 1968; Altman and Narayan, 1997).

The forestry products subsector reflects most of the long-term liquidity characteristics and dimensions of the agriculture sector in Turkey (Acikgoz et al., 2016; Acikgoz et al., 2018). Short-term liabilities and current assets with their components are the main indicators of liquidity for every business.

The flexible part of short-term liabilities is trade credit whereas bank credit is not. The most illiquid part of current assets is inventories on the other hand. Any increase in the scale of the businesses may negatively affect liquidity (Ponikvar et al., 2009).

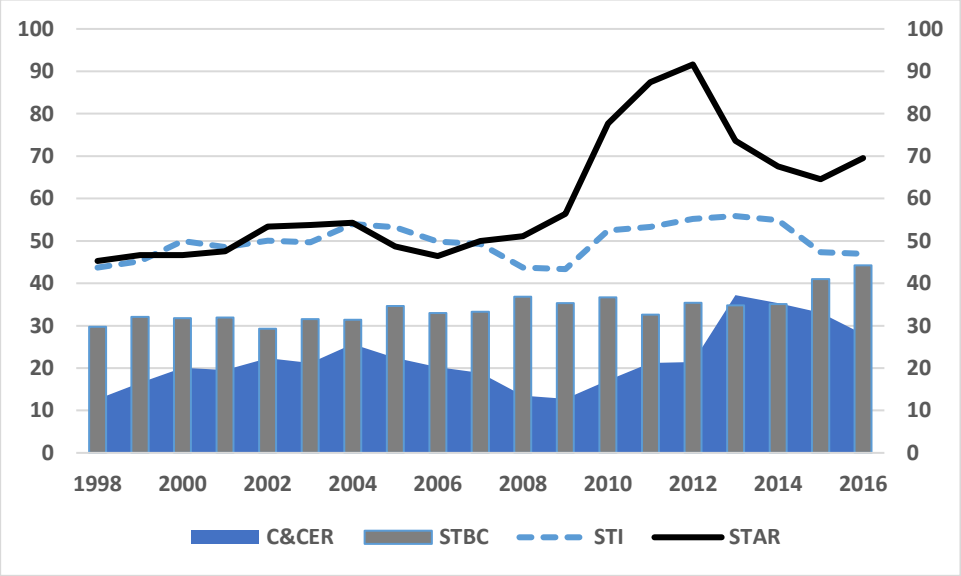
Liquidity in terms of cash is required in the easy provision of financial credit (Sohn and Kim, 2013; Apak et al., 2016). Businesses will comfort their own payment and collection policies (Michalski, 2008) and accounts receivable will also generate cash. Businesses may also look for additional short-term loans if they have volatility in cash generation (Keefe and Yaghoubi, 2016). Bank credit has permanently been an alternative for trade credit (Burkart and Ellingsen, 2004; Chong and Yi, 2011; Psillaki and Eleftheriou, 2015).

There have been new challenges in the forestry sector in marketing (Hansen and Juslin, 2005) with which business finance and liquidity has correlations in terms of collection of accounts receivable and sales policies on cash or credit.

Nonetheless, financial difficulties may force businesses to increase incompetent liquidity from inventories (Dasgupta et al., 2014).

Figure 1 reports the independent variables of the study versus the dependent STI which has had become more dependent on accounts receivable by 2010, and on cash and short-term bank credit by 2014. The liquidity from inventories and accounts receivable are also a result of the marketing strategies and circumstances in which the forestry products sector in Turkey may live difficulties. The leading title among the most serious marketing-related difficulties reported as the condition of the stagnation in domestic markets (Aksu et al., 2011). Supply agreements and/or contracts may create difference with the forestry subsector (Li and Zhang, 2014).

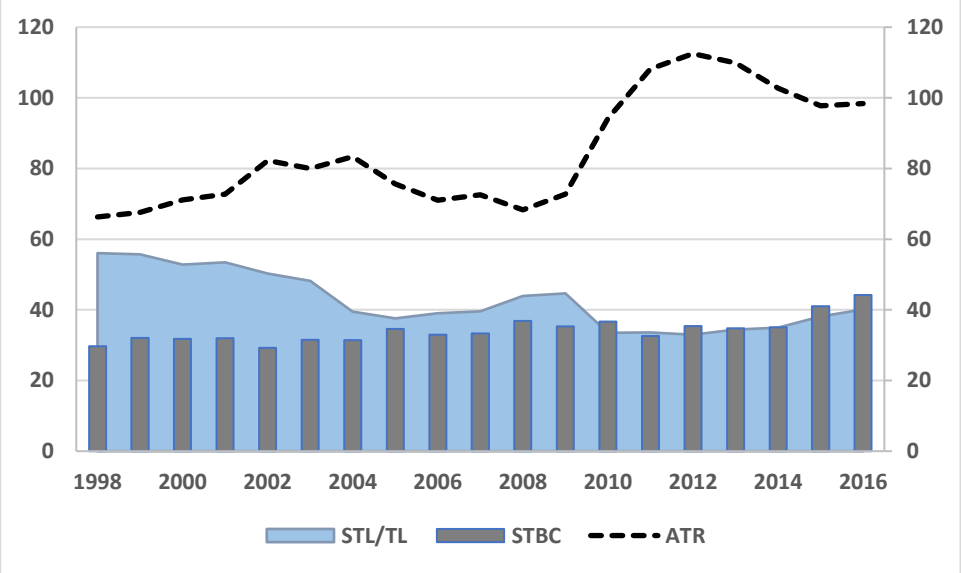
Figure 1. C&CER, STBC, and STAR vs. STI as percentage of STL in forestry products sector-Turkey (1998 – 2016)



Source: Calculations on CBRT data.

A wide use of those agreements or contracts may help in balancing the levels of inventories and accounts receivable and create additional motives of sustainability in cash flow and accumulation for the firms in the subsector. Therefore, inventory level and its relative contribution to the liquidity deserves further analysis in micro scale and under sector specific circumstances. The study reveals that the forestry products subsector has an accounts receivable driven trend on liquidity in the long-run.

Figure 2. STL/TL and ATR vs. STBC as percentage of STL in forestry products sector-Turkey (1998 – 2016)



Source: Calculations on CBRT data.

Figure 2 depicts the increasing trend in short-term bank credit of this subsector, even though the short-term liabilities decrease as a percentage of the total liabilities in the time span.
Table 1 reveals the descriptive statistics on the selected variables. Table 2 reports the relatively low degrees of Pearson correlations of the research data. The inter-item covariance matrix, the summaries of the model, the ANOVA results, coefficients, and residual statistics are given in Tables 3, 4, 5, 6, and 7 respectively.

Table 1. Descriptive characteristics of the selected data in forestry products sector-Turkey (1998 – 2016)

As a percentage of STL	**Minimum**	**Year**	**Maximum**	**Year**	**Average**
STI/STL	43.34	2009	55.86	2013	49.8212
C&CER	12.69	1998	37.21	2013	22.0623
STBC/STL	29.27	2002	**44.22**	**2016**	34.2461
STAR/STL	45.27	1998	91.62	2012	59.5813
ATR	66.28	1998	112.49	2012	84.5839

Source: Calculations of the authors on CBRT data. Note that STBC/STL is at the maximum in 2016.

Table 2. Pearson correlations of the variables

Variables	STI/STL	C&CER	STAR/STL
C&CER	**0.604****		
	0.006		
STBC/STL	-0.091	0.364	
	0.711	0.125	
STAR/STL	**0.552***	0.379	0.411
	0.014	0.110	0.080

*. Correlation is significant at the 0.05 level (2-tailed). **. Correlation is significant at the 0.01 level (2-tailed). Note that N =19 for each variable from 57 observations as three years averages (19 x 3).

Table 3. Inter-item covariance matrix

Variables	STI/STL	C&CER	STBC/STL	STAR/STL
STI/STL	16.321	17.312	-1.354	32.240
C&CER	17.312	50.278	9.502	38.827
STBC/STL	-1.354	9.502	13.519	21.873
STAR/STL	32.240	38.827	21.873	209.173

Note that N =19 for each variable from 57 observations as three years averages (19 x 3).

Table 4. Model summaries

R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
0.841[a]	0.707	0.649	2.39481	1.497

[a]. Predictors: (Constant), C&CER, STBC/STL, and STAR/STL. STI/STL is the dependent variable and the independent variables are C&CER, STBC/STL, and STAR/STL for the model.

Table 5. ANOVA results of the model

Models	Sum of Squares	df	Mean Square	F	Sig.
Regression	207.760	3	69.253	12.075	0.000[a]**
Residual	86.026	15	5.735		
Total	293.786	18			

[a]. Predictors: (Constant), C&CER, STBC/STL, and STAR/STL. STI/STL is the dependent variable and the independent variables are C&CER, STBC/STL, and STAR/STL for the model. **. Significant at the 0.01 level.

Table 6. Coefficients of the model

	Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
	B	Std. Error	Beta	*t*	Sig.	Tolerance	VIF
(Constant)	53.288	5.294		10.066	0.000		
C&CER	0.337	0.089	0.591	3.794	0.002	0.804	1.243
STBC/STL	-0.584	0.174	-0.531	-3.359	0.004	0.780	1.282
STAR/STL	0.153	0.044	0.547	3.434	0.004	0.771	1.298

Note that N =19 for each variable from 57 observations as three years averages (19 x 3). STI/STL is the dependent variable for the model, the independent variables are C&CER, STBC/STL, and STAR/STL for the model. VIFs and tolerances are very close to 1.

Table 7. Residuals statistics

	Minimum	Maximum	Mean	Std. Deviation
Predicted Value	44.1261	56.7429	49.8212	3.39738
Residual	-3.41689	5.14784	0.00000	2.18615
Std. Predicted Value	-1.676	2.037	0.000	1.000
Std. Residual	-1.427	2.150	0.000	0.913

STI/STL is the dependent variable for the model. The independent variables are C&CER, STBC/STL, and STAR/STL for the model.

ANOVA results are significant at 0.01 per cent in the estimation of STI with the independent variables of C&CER, STBC/STL, and STAR/STL. Along with collinearity diagnostics of the model for each variable from 57 observations as three years averages (Table 8), we have also tested the assumptions of the regression on serial correlation, heteroscedasticity, and normality (Table 9). Afterwards, we have further analyzed the data to reveal the appropriate lag length as lag 1 according to Akaike information criterion which is the smallest, nevertheless all criteria reflect lag 1 as well (Table 10).

Table 8. Collinearity diagnostics of the model

			Variance Proportions			
Dimension	Eigenvalue	Condition Index	(Constant)	C&CER	STBC/STL	STAR/STL
1	3.908	1.000	0.00	0.00	0.00	0.00
2	0.056	8.325	0.03	0.95	0.01	0.03
3	0.031	11.262	0.07	0.02	0.03	0.94
4	0.005	27.927	0.91	0.03	0.96	0.03

Note that N=19 for each variable from 57 observations as three years averages (19 x 3). Condition index for the model are below 20 up to the third dimension. STI/STL is the dependent variable and the independent variables are C&CER, STBC/STL, and STAR/STL for the model.

Table 9. Test confirming assumptions of the regression

Test	Prob. *
Breusch-Godfrey Serial Correlation LM Test: Obs*R-squared Prob. Chi-Square (10)	0.2808
Breusch-Pagan-Godfrey Heteroscedasticity Test: Obs*R-squared Prob. Chi-Square (3)	0.7973
Jarque Bera Test: Prob.	0.6706

All tests confirm no serial correlation, no heteroscedasticity, and normality for the model as p values > 0.05 (Breusch, 1978; Godfrey, 1978a; Breusch and Pagan, 1979; Godfrey, 1978b; Jarque and Bera, 1980; Jarque and Bera, 1987). STI/STL is the dependent variable and the independent variables are C&CER, STBC/STL, and STAR/STL for the model.

Table 10. VAR Lag order selection

Lag	LogL	LR	FPE	AIC	SC
0	-216.3371	NA	504262.7	24.48190	24.67976
1	-173.0616	62.50907*	25841.56*	21.45129*	22.44059*

* indicates lag order selected by the criterion at VAR (Akaike, 1973; Akaike, 1974; Akaike 1979; Schwarz, 1978; Lutkepohl, 1991; Lutkepohl, 2004). Exogenous variables: C. Sample: 1998-2016. Included observations: 18. LR: sequential modified LR test statistic (each test at 5% level). FPE: Final prediction error. AIC: Akaike information criterion. SC: Schwarz information criterion.

Table 11. Group unit root tests at level of first differences.

Group of the series	Method	Statistic	Prob.**	Cross-sections	Obs
STI, C&CER, STBC, and STAR	Null: Unit root (assumes common unit root process)				
	Levin, Lin and Chu t	-4.45014	0.0000	4	68
	Null: Unit root (assumes individual unit root process)				
	Im, Pesaran and Shin W-stat	-4.63592	0.0000	4	68
	ADF - Fisher Chi-square	34.2823	0.0000	4	68
	PP - Fisher Chi-square	34.2394	0.0000	4	68

** Probabilities for Fisher tests are using an asymptotic Chi-square distribution. All other tests assume asymptotic normality (Levin et al., 2002; Im et al., 2003; Dickey and Fuller, 1979; Fisher, 1932; Phillips and Perron, 1988). Sample: 1998-2016. Exogenous variables: Individual effects. Automatic selection of maximum lags. Automatic lag length selection based on SIC: 0. Newey-West automatic bandwidth selection and Bartlett kernel. Balanced observations for each test.

To eliminate the probability of the presence for a spurious regression, group unit root test is also conducted, and significant results are given (Table 11).

Table 12. Unrestricted cointegration rank tests for the group of the series

Hyp. No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.886129	88.01883	47.85613	0.0000
At most 1 *	0.836981	51.08305	29.79707	0.0001
At most 2 *	0.556811	20.24696	15.49471	0.0089
At most 3 *	0.314247	6.413047	3.841466	0.0113
Hyp. No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.886129	36.93578	27.58434	0.0024
At most 1 *	0.836981	30.83609	21.13162	0.0016
At most 2	0.556811	13.83392	14.26460	0.0584
At most 3 *	0.314247	6.413047	3.841466	0.0113

Group: STI, C&CER, STBC, and STAR. Unrestricted Cointegration Rank Test: Trace and Maximum Eigenvalue (Johansen, 1988; Johansen, 1995; Pesaran and Shin, 1998). Sample (adjusted): 2000 2016. Included observations: 17 after adjustments. Trend assumption: Linear deterministic trend. Lags interval (in first differences): 1 to 1. * denotes rejection of the hypothesis at the 0.05 level. **MacKinnon-Haug-Michelis (1999) p-values. Trace test indicates 4 cointegrating eqn(s) at the 0.05 level. Max-eigenvalue test indicates 2 cointegrating eqn(s) at the 0.05 level.

Table 13. Significant results of pairwise Granger causality tests for the group of series.

Lag	Null Hypothesis:	Obs	F-Statistic	Prob.
1	STI does not Granger Cause STAR	18	7.98634	0.0128
1	STAR does not Granger Cause C&CER	18	9.38310	0.0079
2	C&CER does not Granger Cause STBC	17	5.53551	0.0198
2	STAR does not Granger Cause C&CER	17	4.90193	0.0278
2	STBC does not Granger Cause STAR	17	11.8486	0.0014
3	C&CER does not Granger Cause STBC	16	4.54038	0.0335
3	STBC does not Granger Cause STAR	16	7.31097	0.0087
4	C&CER does not Granger Cause STBC	15	5.32004	0.0355

Reports only the significant results at the 0.05 level for Pairwise Granger Causality Tests on the group of the series for Lag 1–4. Sample 1998–2016.

Then, cointegration has been analyzed and at least 2 cointegrating equations are reported by the Johansen cointegration test (Table 12). Finally, causalities among the series of the group are revealed as well. The results depict granger causality between the variables of the study from first up to fourth lag (Table 13).

Short-term inventories have granger causality relation with short-term accounts receivable at the first lag and the latter does granger cause cash and cash equivalents in the forestry products subsector. Finally, we conclude that the presence of stationary series and the cointegration equations confirm the model in both the time span studied or short and the long run.

Conclusion

The subsector of forestry products in Turkey has a liquidity which could be explained in terms of cash, accounts receivable, and inventories in the long-run as expected in many sectors and subsectors. The inventories have had a steady cruise with a changing dependency. Nevertheless, along with the relations with accounts receivable and cash, the results of the study reveal the dependence of the short-term inventories on short-term bank credit used with a relatively negative coefficient though the decreasing level of short-term liabilities in the long-run.

After analyzing the sub-sectoral selected data on liquidity in the long-term, we may conclude that the inventories in the forestry products subsector has relatively low degrees of correlations with cash and cash equivalents, accounts receivable, and short-term bank credit; though the diminishing trend of short-term liabilities from 1998 to 2016 as three years aggregate balance sheet averages in the very long-run. However, the model designed in the study has the regression with significant and robust results of the tests. The findings depict the evidence of cash and cash equivalents dependency of the inventories with higher significance and a deuce in significance of short-term accounts receivable and short-term bank credit for the subsector. The results also confirm the existence of stationary series and cointegrating equations for the variables in the model of the study in which the series have significant Granger causalities as well.

Inventories of a business consisting of the most illiquid part in the current assets are funded by short-term bank credits which are seen as an inflexible source of finance tying up the collateral potential or credit limits. We therefore emphasize the recently squeezing condition of liquidity in the subsector analyzed and offer suggestions on the results in order to hedge against the potentially negative liquidity conditions of the future. Since a profound uprising wave of short-term bank credit has been revealed, the below given precautions will much help the subsector and ensure the sustainability in the forestry products subsector. Therefore, the businesses operating in this explicit subsector would better:

1. Try to readapt marketing strategies which will assess the significance of cash and accounts receivable on their liquidity.
2. Provide an upper limit for their inventories in order to limit the short-term bank credit financing on this most illiquid component of their current assets.
3. Redesign receivables to payables due times so as to favor the diminishing trend of their short-term liabilities.
4. Supply agreements and/or contracts will help in balancing the levels of inventories and accounts receivable and add on sustainability in cash flows.
5. Concentrate on the leading significance of cash and cash equivalents over their inventories.

The study is expected to offer favorable clues on the concealing aspects of liquidity for the forestry products subsector and businesses. A set of limitations is also present for the study; such as the use of ratio analysis and aggregate local data which may not reflect the whole forestry products industry in Turkey with the constraints and assumptions of the CBRT methodology. However, the results of the study might be a milestone for the future research in enlightening the other titles of financial analysis for the subsector which has been studied only in terms of liquidity herein.

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