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PIOTRA CYPLIKA

MICHAŁA ADAMCZAKA



# WYBRANE PROBLEMY WSPOŁCZESNEJ LOGISTYKI W ŚWIETLE BADAŃ NAUKOWYCH I PRAKTYKI BIZNESOWEJ

## ROZDZIAŁ 9

THE IMPACT OF THE ECONOMIC CRISIS  
ON GLOBAL LOGISTIC'S OPERATORS LIABILITIES  
**TOMASZ P. TYC, POLITECHNIKA WARSZAWSKA**



WYŻSZA SZKOŁA  
LOGISTYKI  
WYDAWNICTWO

## **ROZDZIAŁ 9.**

# **THE IMPACT OF THE ECONOMIC CRISIS ON GLOBAL LOGISTIC'S OPERATORS LIABILITIES**

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### **1. Introduction**

Active economic entities encompassing the broad Transport – Spedition – Logistic are largely seen by many economist and management practitioners as a leading indicator for the general state of both the national and global economy. Several global indicators are today used to show the ups and downs of the global economic cycle. However those indicators seldom concerns the economic situation of individual companies.

The majority of analysis presented in economic papers that concerns TSL companies are concentrated on the income statement (or profit and loss account – P&L). Quite often they are supplemented by cash flow statements analysis, which show how do the changes in balance sheet accounts and income affects the company liquidity (through cash and cash equivalents), and thus – the ability of a company to sustain its present business model. Additionally information concerning the asset-side of a statement of financial position (or balance sheet).

However we still lack an in-depth knowledge on how TSL companies are financing their operations. This information is hidden within the liabilities side of the balance sheet. Information provided by the companies themselves can be used to assess the efficiency of their model in terms of solvency, sustainability as well as

balancing the different financing schemes needed to run the daily operations of the entity itself, as described by ie. [Kim, Tesar, Zhang ,2015; Bleakley, Cowan, 2009].

The analysis of the changes to the liabilities-side of the statement of financial position can assess the efficiency of business models of TSL companies in time of important economic downturn or high market volatility. External factors concerning incomes levels or profit margins have strong transposition on the financing structure of a company [Tsoy, Heshmati, 2017]. When external factors lower the profitability of a company, they also worsen the entities access to competitively-priced market-side financing mechanism (leasing, credit, money & debt market). Thus forcing the company to resort to other means of sustaining it's assets, as described by Tektas, [Ozkan-Gunay, Gunay, 2005].

Both the global financial crisis of the 2007-2010, as well as the outburst of the so-called dot-com bubble from the beginnings of the years 2000 have had an important impact on both the global economy, as well as TSL companies. Thus the crisis impact on the liabilities-side of balance sheets of entities making the Transport – Spedition – Logistic sector should be analysed. In order to ensure the completeness of data as well as to provide a high level of comparability, the author assess only publicly-traded entities belonging to one of the following market indexes: RAY3000 (American-broad market), SP/TSX(Canadian-broad market), STOXX (Western European – EU15, EEA, Switzerland) and WIG (Warsaw).

## **2. Materials and methods**

The first challenge was to define quoted entities belonging to the broad Transport – Spedition – Logistic sector of companies (publicly listed on various European and North American stock exchange). In order to allow an easy data access the author has chosen to limit the companies to those that according to The Industry Classification Benchmark [ICB, 2017] were active in the Industrial transportation sector. This sector is further broken into five subsectors that are broadly representing services the closest to the classical definition of TSL services. Those subsectors are the following:

- Delivery Service,
- Marine Transportation,
- Railroads,
- Transportation service,
- Trucking.

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The Industry Classification Benchmark classification was created by the FTSE (a subsidiary of the London Stock Exchange - LSE) and by Dow Jones & Company (a subsidiary of the NY-listed and based News Corp). However – ICB is only one of the three major sectorial and industrial taxonomy in today's operation – the other two being: The Global Industry Classification Standard (created in 1997 by MSCI and Standard & Poor's), and The Bloomberg Industrial Classification System (created by Bloomberg).

Tab. 9.1. Number of chosen entities from the four market indices by country and ICB subsector classification.

		Delivery Service	Marine Transportation	Railroads	Transportation service	Trucking	Total
Index	Country						
STOXX	Austria	1					1
	Belgium	2					2
	Denmark		3		1		4
	France				4		4
	Germany	1			1		2
	Italy	1			5		6
	Netherlands	2					2
	Norway	1	3		3		7
	Portugal				1		1
	Spain	1			1		2
	Sweden				1		1
	Switzerland		1		2		3
	UK	1			1		2
RAY3000	USA	11	32	5	9	4	61
SPTSX	Canada		3	2	1		6
WIG	Poland			2	2	1	5
	Total	21	42	104	348	69	108

Source: Author's inquiries through Bloomberg Terminal

The entities chosen for the liabilities-side analysis, are all quoted entities, belonging to one of the four index:

- The Russell 3000 Index (TICKER: RA) – this American index is composed of 3000 large U.S. – based companies (the size of entities is determined by their actual market capitalization). Those securities represents approximately 98% of the so-called investable U.S. equity market,

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- The S&P/TSX Composite (TICKER: SPTSX) – This the headline market index for Canada, representing broadly 249 entities.
- STOXX All Europe 800 or Euro Stoxx 800 (TICKER: SXEBMP) – This European index presents the largest 800 companies in Eastern and Western Europe.
- WIG (TICKER: WIG) – The broad market index of the Warsaw Stock Exchange.

A number of entities has been chosen in the different asset classes, their list being presented below<sup>1</sup>.

The author will analyse the following elements of the statement of financial position:

- Net Change to Short Term Debt;
- Net Change to Long Term Debt;
- Net Change in Other Liabilities;
- Reinvested Earnings;

<sup>1</sup> For Delivery Service: Aena SA, Air Transport Services Group Inc, Atlas Air Worldwide Holdings Inc, bpost SA, CH Robinson Worldwide Inc, Deutsche Post AG, Enav SpA, Euronav NV, Expeditors International of Washington Inc, FedEx Corp, Forward Air Corp, Koninklijke Vopak NV, Landstar System Inc, Matson Inc, Oesterreichische Post AG, PostNL NV, Royal Mail PLC, Ryder System Inc, United Parcel Service Inc, Wilh Wilhelmsen ASA, XPO Logistics Inc.

For Marine Transportation: Air Lease Corp, Aircastle Ltd, AP Moller - Maersk A/S, ArcBest Corp, Ardmore Shipping Corp, Avance Gas Holding Ltd, BW LPG Ltd, CAI International Inc, Celadon Group Inc, DHT Holdings Inc, Dorian LPG Ltd, DSV A/S, Echo Global Logistics Inc, Frontline Ltd/Bermuda, Gener Maritime Inc, Hub Group Inc, International Seaways Inc, JB Hunt Transport Services Inc, Kirby Corp, Knight Transportation Inc, Kuehne + Nagel International AG, Marten Transport Ltd, Mullen Group Ltd, Navios Maritime Acquisition Corp, Nordic American Tankers Ltd, Ocean Yield ASA, Overseas Shipholding Group Inc, PAM Transportation Services Inc, PHH Corp, Saia Inc, Scorpio Bulkers Inc, Scorpio Tankers Inc, Swift Transportation Co, Teekay Corp, Textainer Group Holdings Ltd, TFI International Inc, Triton International Ltd/Bermuda, Universal Logistics Holdings Inc, Westshore Terminals Investment Corp, World Fuel Services Corp, YRC Worldwide Inc.

For Railroads: Canadian National Railway Co, Canadian Pacific Railway Ltd, CSX Corp, Genesee & Wyoming Inc, Kansas City Southern, Norfolk Southern Corp, PCC Intermodal SA, PKP Cargo SA, Union Pacific Corp.

For Transportation services: Abertis Infraestructuras SA, Aeroports de Paris, Ansaldo STS SpA, ASTM SpA, Atlantia SpA, BBA Aviation PLC, Bollore SA, Costamare Inc, Covenant Transportation Group Inc, CTT-Correios de Portugal SA, Dfds A/S, Element Fleet Management Corp, Era Group Inc, Financiere de L'Odette, Flughafen Zuerich AG, Fraport AG Frankfurt Airport Services Worldwide, Frontline Ltd/Bermuda, GasLog Ltd, Groupe Eurotunnel SE, Macquarie Infrastructure Corp, Nobina AB, OT Logistics SA, Panalpina Welttransport Holding AG, SAVE SpA/Venezia, Ship Finance International Ltd, Societa Iniziative Autostradali e Servizi SpA, Stolt-Nielsen Ltd, WDX SA, Wesco Aircraft Holdings Inc, Wilh Wilhelmsen Holding ASA, Willis Lease Finance Corp.

- Total Lines of Credit.

The abovementioned indicators can be used to analyse changes in the methods being used by individual business entities to provide cash and liquidity to support their business models. However due to different listings history, as well as the length of fiscal years, of the chosen companies and business entities, the author cannot make a fully comparable study of the abovementioned statement of financial position components and indicators. However that can be circumvented by the use of a value-based index for the said analysis.

Additionally the following indicators will be taken into account to present the impact of the economic crises on the functioning of the different analysed entities:

- Total Debt to Total Capital – in order to identify the amount of leverage utilized by a specific company, and thus the risk taken by the entity;
- Total Debt to Tangible Book Value – in order to assess the net value of the company in the case of its liquidation due to bankruptcy;
- Total Debt to Market Capitalization Ratio – in order to identify the volatility of a particular stock by analyzing the comparison of debt and market value.

However the reader should take into account the fact that DuPont's analysis have many limitations when used to assess entities belonging to different sectors of the economy. And thus the results obtained through it should be treated carefully.

### **3. Results, principal.**

The following figures (Fig. 9.1., Fig. 9.2., Fig. 9.3., Fig. 9.4 and Fig. 9.5.) presents the net change in total liabilities and their components for the five subsector classification of ICB – Industrial transportation for the years 2002 – 2016, thus illustrating the impact of two economic crisis: the dot-com bubble of the 2000's as well as the global slowdowns of the years 2008+.

The impact of the dot-com bubble on TSL entities is varied to say at least on the different analysed market index and the entities there are made of. A clearly negative impact can be seen on both Russell 3000 companies as well as Stoxx All Europe 800 entities making up Marine Transportation and Delivery Service, albeit with some discrepancies between the two indexes. S&P TSX entities seems to be least affected apart for Railroads. Due to data access issue WIG entities were not taken into account during the dot-com bubble impact analyses.

A major difference between companies listed on the various stock exchange can be seen in the net change in access to external equity financing. Whenever all the companies are deleveraging in 2002, in the subsequent years, Euro Stoxx

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entities from 2003 onwards note positive inflows in this category. By contrast both Russel 3000 and S&P TSX entities are noting a deficit in this form of liquidity for their business model.

Please refer to Tab. 9.2. below to a full assessment of the results obtained.

Tab. 9.2. The impact of the dot-com bubble on ICB Subsectors for the four Market Index (in bln EUR).

ICB Subsector	Index	2002	2003
Delivery Service	Russell 3000	A sharp decrease in <i>long term debt*</i> (by more than 1,2 bln), affects <i>total liabilities*</i> (a decrease of more than 0,7 bln). At the same time – growth in <i>short term debt*</i> .	A sharp increase in <i>other liabilities*</i> (by more than 1,4 bln). <i>Total liabilities</i> end positively
	Euro Stoxx	A relative decrease of <i>short term debt</i> (by more than 0,5 bln), however compensated more than enough through <i>long term debt</i> (0,8 bln) and <i>other liabilities</i> (3,5 bln)	A sharp decrease of <i>other liabilities</i> (by more than 9,9 bln). The increase in <i>long</i> (0,8 bln) and <i>short term liabilities</i> (0,2 bln) was not enough to compensate this loss.
Marine Transportation	Russell 3000	A sharp decrease in <i>total liabilities</i> (appr. 0,4 bln) due to <i>long term debt</i> deleveraging (app. 0,5 bln). Some increase in <i>other liabilities</i> .	A sharp increase in <i>total liabilities</i> (app. 2 bln) due to <i>long term debt</i> (app. 1,6 bln) and <i>other liabilities</i> . Additional strength provided by <i>short term debt</i> .
	Euro Stoxx	A sharp decrease of <i>total liabilities</i> (appr. 2,3 bln) due to <i>long term debt</i> deleveraging (app. 3,6) partly compensated by <i>other liabilities</i> .	A sharp decrease of <i>total liabilities</i> (app. 3,5 bln) due to all three components deleveraging.
	S&P TSX	Deleveraging on <i>long term debt</i> (app. 25 mln), leads to a decrease in <i>total liabilities</i> (app. 6 mln).	An increase of <i>total liabilities</i> lead by both <i>other liabilities</i> (app. 84 mln) and <i>long term liabilities</i> (app. 41 mln). A slight decrease in <i>short term liabilities</i> .
Railroads	Russell 3000	<i>Short term liabilities</i> deleveraging fully compensated by <i>long term</i> and <i>other liabilities</i> increase (a surplus of 0,2 bln recorded).	A sharp increase in both <i>long term</i> and <i>other liabilities</i> leads to an increase for <i>total liabilities</i> by app. 1 bln.
	S&P TSX	<i>Long term liabilities</i> deleveraging not compensated by increases in both <i>short term</i> and <i>other liabilities</i> increase (a deficit of 0,3 bln recorded).	Deleveraging in all three components – <i>total liabilities</i> decreases by app. 0,9 bln
Transportation service	Russell 3000	Deleveraging across all components, leads to sharp decrease of <i>total liabilities</i> (app. 0,4 bln)	Strong increase across <i>short</i> and <i>long term liabilities</i> , compensates fully for deleverage in <i>other liabilities</i> (app. 0,8 bln surplus in <i>total liabilities</i> )
	Euro Stoxx	Strong increase across all components, leads to sharp development of <i>total liabilities</i> (app. 11 bln)	Strong increase across <i>other</i> and <i>long term liabilities</i> , compensates fully for deleverage in <i>short term liabilities</i> (app. 5 bln surplus in <i>total liabilities</i> )
Trucking	Russell	Strong increase across <i>other</i>	Strong increase across <i>other</i>

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	3000	<i>liabilities and short term debt, compensates fully for deleverage in long term l debt (app. 0,2 bln surplus in total liabilities)</i>	<i>liabilities and long term debt, compensates fully for deleverage in short term debt (app. 0,4 bln surplus in total liabilities)</i>
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Source: Author's inquiries through Bloomberg Terminal

\* If not written otherwise – only total *net change* of the different components of *liabilities*.

In case of the global slowdowns of the years 2008+, the results obtained are much more complex. The size of the market have an important influence on the liabilities of TSL companies. The force of the above mentioned impact is different across the different ICB-based subsectors. Please refer to Tab. 9.3. below to a full assessment of the results obtained.

Tab. 9.3. The impact of the 2008+ slowdown on ICB Subsectors for the four Market Index (in bln EUR).

ICB Subsector	Index	2008 – 2014 (the slowdowns)	2015 – 2016 (the aftermath)
Delivery Service	Russell 3000	Shortage in <i>total liabilities</i> * can be seen in the years 2008-2009 and 2013, due to deficiency in the three components of <i>liabilities</i> .	Surplus in <i>total liabilities</i> due to overall soundness in all three components.
	Euro Stoxx	Shortage in <i>total liabilities</i> can be seen in the years 2011-2013, due to deficiency in <i>short term debt*</i> and <i>other liabilities</i> *	Shortage in <i>total liabilities</i> can be seen due to deficiency in all three components of <i>liabilities</i> .
Marine Transportation	Russell 3000	Shortage in <i>total liabilities</i> can be seen only in the years 2008-2009, due to deficiency in both <i>long*</i> and <i>short term debt</i> . Albeit <i>other liabilities</i> are positive.	Surplus in <i>total liabilities</i> due to overall soundness in all three components.
	Euro Stoxx	Shortage in <i>total liabilities</i> can be seen in the years 2010 and 2012-2014, due to deficiency in both <i>long term</i> and <i>other liabilities</i> . Surplus in <i>short term liabilities</i> is insufficient to compensate.	Positive balance of <i>total liabilities</i> , even though deficit can be seen in both <i>other liabilities</i> as well as <i>short term debt</i> .
	S&P TSX	Shortage in <i>total liabilities</i> can be seen in the years 2012-2013, due to deleveraging in all three components of <i>liabilities</i> .	Negative balance of <i>total liabilities</i> due to deleveraging in both <i>long term debt</i> and <i>other liabilities</i> . Surplus in <i>short term debt</i> is not sufficient to overcome this imbalance.
Railroads	Russell 3000	Positive balance in <i>total liabilities</i> , even though a deficit in <i>short term debt</i> can be seen in the years 2009, 2011 and 2014.	Surplus in <i>total liabilities</i> due to overall soundness in all three components.
	S&P TSX	Deleveraging in <i>long term debt</i> in the years 2009-2010 leads to deficit in <i>total liabilities</i> . However a surplus in both <i>short term debt</i> and <i>other liabilities</i> recorded, does not compensate for this.	Surplus in <i>total liabilities</i> due to overall soundness in all three components.
	WIG	Deficit in <i>total liabilities</i> is recorded in the years 2009 and 2013 due to deleveraging in either <i>long term debt</i>	Surplus in <i>total liabilities</i> due to overall soundness in all three components. Lack of financial results

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		or other liabilities.	for the year 2016.
Transportation service	Russell 3000	Deleveraging in all components during the years 2009-2011 leads to deficit in <i>total liabilities</i> .	Surplus in <i>total liabilities</i> in 2015 due to overall soundness in all components, apart for <i>short term debt</i> . However in 2016 a deficit of <i>total liabilities</i> is noted due to deleveraging in <i>other liabilities</i> .
	Euro Stoxx	Deleveraging in <i>total liabilities</i> are recorded in the years 2011 and 2014 due to deficit in <i>long term debt</i> . Even though a surplus is noted in other components of liabilities.	Surplus in <i>total liabilities</i> due to overall soundness in all components, apart for <i>other liabilities</i> .
	S&P TSX	Positive balance in <i>total liabilities</i> due to surplus in all three components.	Surplus in <i>total liabilities</i> due to overall soundness in all three components. Lack of financial results for the year 2016.
	WIG	Deleveraging in <i>total liabilities</i> recorded in the years 2009 and 2013 due to deficit in <i>long term debt</i> and <i>other liabilities</i> . However a surplus in <i>short term debt</i> was recorded in the same years.	Deleveraging in <i>total liabilities</i> due to deficit in <i>long term</i> and <i>other liabilities</i> . Lack of financial results for the year 2016.
Trucking	Russell 3000	Deleveraging in <i>total liabilities</i> are recorded in the years 2008 and 2010 due to deficit in <i>long term</i> and <i>short term debt</i> and/or <i>other liabilities</i> .	Surplus in <i>total liabilities</i> in 2015, even though a deficit in <i>short term debt</i> and <i>other liabilities</i> was recorded. However – followed by deleveraging of <i>total liabilities</i> in 2016 due deficit in <i>long term debt</i> and <i>other liabilities</i> .
	WIG	Positive balance in <i>total liabilities</i> due to surplus in all three components.	Deficit in <i>total liabilities</i> due shortage in both <i>long</i> and <i>short term debt</i> . Lack of financial results for the year 2016.

Source: Author's inquiries through Bloomberg Terminal

\* If not written otherwise – only total net change of the different components of liabilities.

The following Figures illustrated the net changes of liabilities for different ICB subsectors. The four Market Index show little common results for the total change of the liabilities components. This is in range with results obtained by Tsoy & Heshmati [2017].

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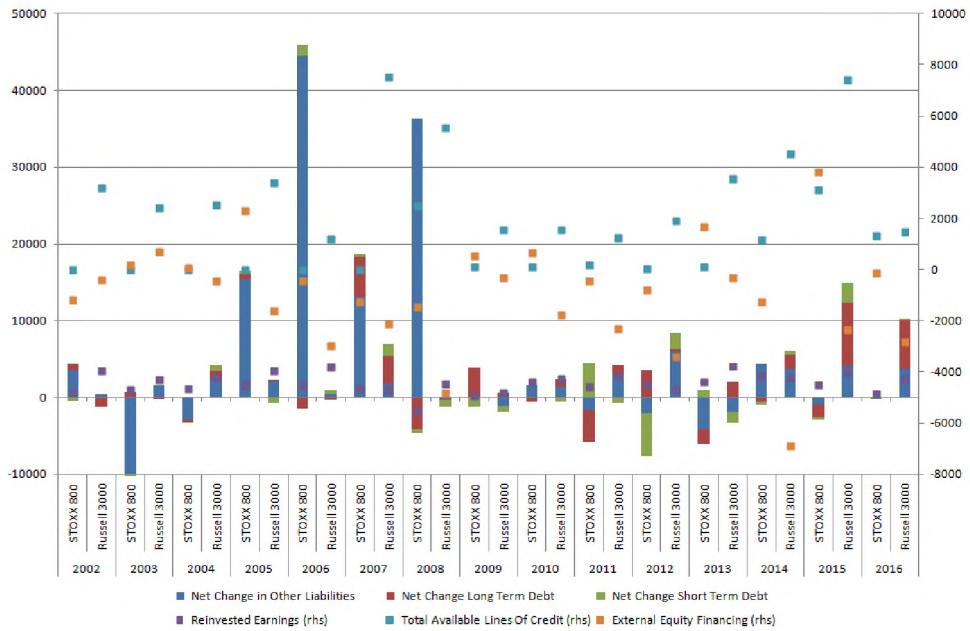


Fig. 9.1. Net Change for Liabilities (and their components) for ICB subsector: Delivery sector.

Source: Author's inquiries through Bloomberg Terminal.

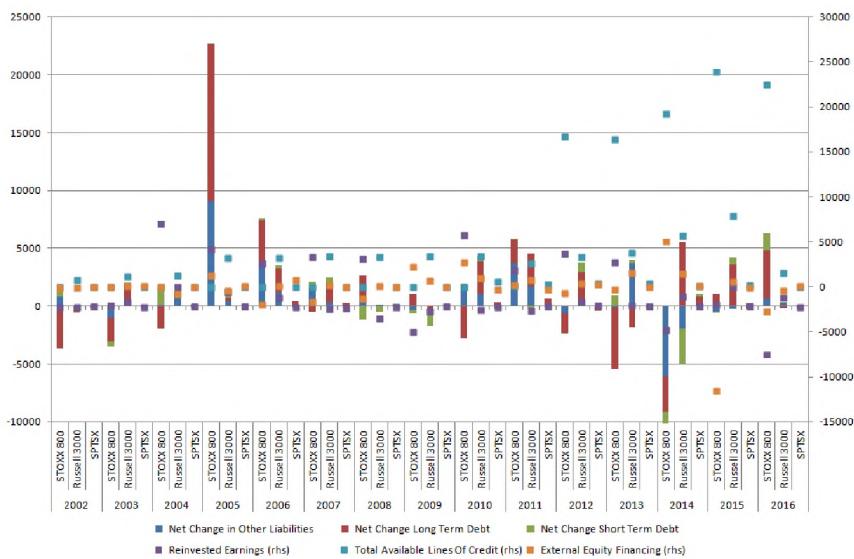


Fig. 9.2. Net Change for Liabilities (and their components) for ICB subsector: Marine Transportation.

Source: Author's inquiries through Bloomberg Terminal.

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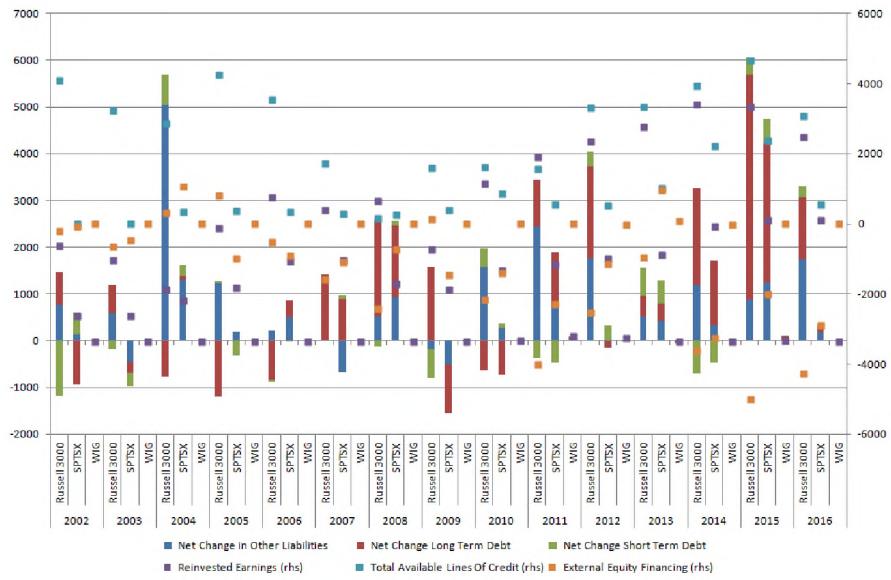


Fig. 9.3. Net Change for Liabilities (and their components) for ICB subsector: Railroads.  
Source: Author's inquiries through Bloomberg Terminal.

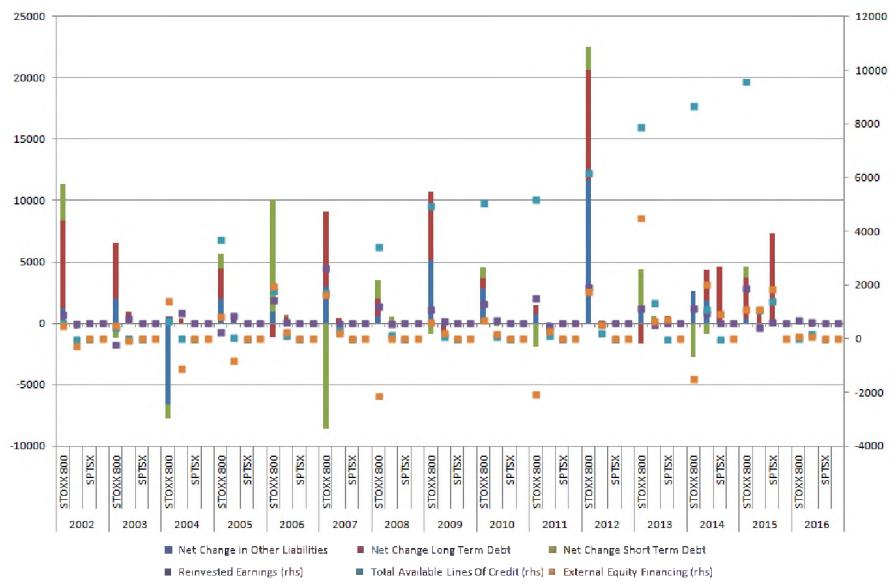


Fig. 9.4. Net Change for Liabilities (and their components) for ICB subsector:  
Transportation Service.  
Source: Author's inquiries through Bloomberg Terminal.

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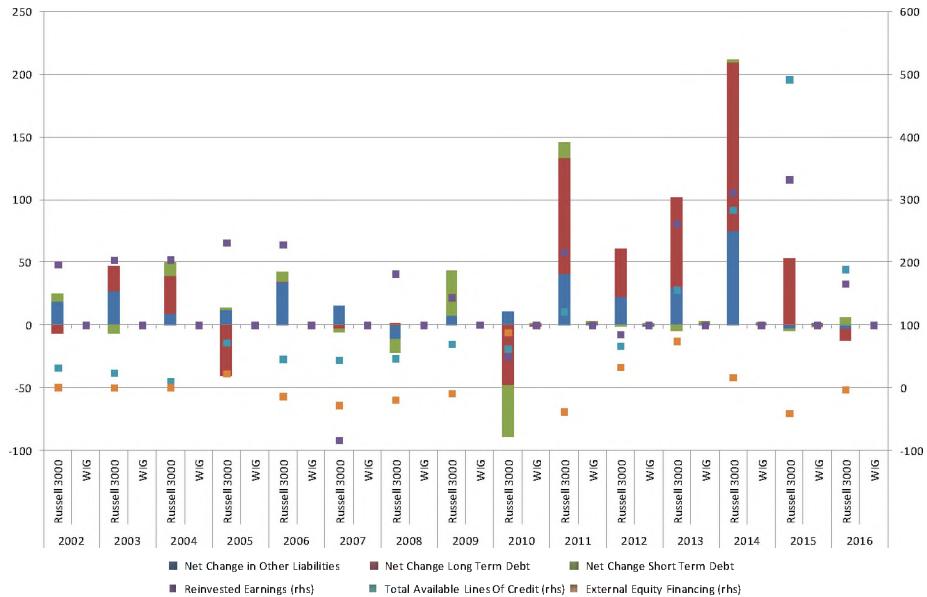


Fig. 9.5. Net Change for Liabilities (and their components) for ICB subsector: Trucking  
Source: Author's inquiries through Bloomberg Terminal.

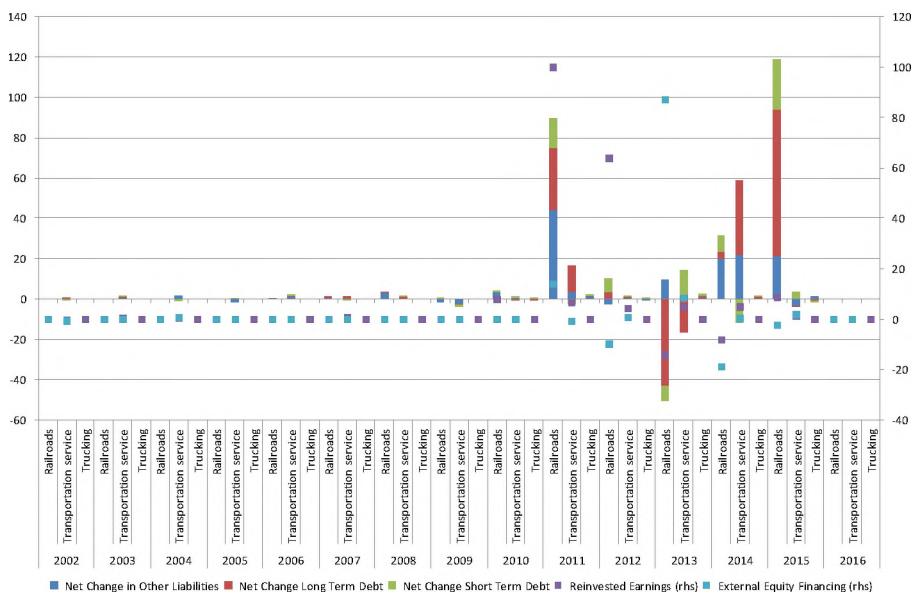


Fig. 9.6. Net Change for Liabilities (and their components) of WIG companies  
Source: Author's inquiries through Bloomberg Terminal.

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The following table presents data for the three analysed DuPont economic ratios indicators that best describes the individual subsector reaction to the economic crisis. Due to lack of sufficient and adequate data to provide long term time series, the table presents below provide data for the years 2014-2016. However even a short sample of the Transport Subsector shows results in line with global data compiled by Demirguc-Kunt, Soledad Martinez-Peria & Tressel [2015].

Index	ICB Subsector	2016	2015	2014	2016	2015	2014	2016	2015	2014
		median			maximum			minimum		
Total Debt to Total Capital Ratio										
Euro Stoxx	Delivery Service	37,92	38,58	45,97	116,56	128,26	186,76	0,83	1,93	2,46
	Marine Transportation	35,91	33,79	30,93	65,59	62,05	58,05	0,69	0,84	1,21
	Transportation service	46,42	44,15	46,55	76,05	80,87	93,42	0,25	0,03	0,09
Russell 3000	Delivery Service	39,86	39,47	33,65	72,43	73,47	72,23	0,00	0,00	0,00
	Marine Transportation	42,41	41,57	39,4	171,65	154,34	174,62	1,77	8,47	0,00
	Railroads	42,36	43,65	40,6	49,13	47,52	46,57	36,01	36,24	36,15
	Transportation service	53,98	54,5	50,73	80,65	80,54	79,5	32,95	36	26,34
	Trucking	0,00	15,8	25,84	0,00	42,39	50,07	0,00	0,00	4,91
S&P TSX	Marine Transportation	28,01	32,79	29,27	42,01	49,19	43,9	0,00	0,00	0,00
	Railroads	53,84	53,11	44,49	65,24	65,13	50,66	42,43	41,09	38,33
	Transportation service	77,66	76,58	74,3	77,66	76,58	74,3	77,66	76,58	74,3
WIG	Railroads	34,02	41,31	30,65	34,02	60,02	45,88	34,02	22,59	15,42
	Transportation service	50,21	47,33	47,26	50,21	47,33	47,26	50,21	47,33	47,26
Total Debt to Tangible Book Value Ratio										
Euro Stoxx	Delivery Service	-0,02	0,10	0,49	1,97	2,71	3,83	-4,03	-3,47	-1,75
	Marine Transportation	0,45	0,87	0,22	1,96	1,69	1,48	-2,63	0,01	-2,19
	Transportation service	-0,09	0,68	-3,71	5,43	8,92	2,36	-16,89	-9,71	-34,8
Russell 3000	Delivery Service	-1,64	0,66	1,55	3,33	6,15	8,94	-8,7	-12,16	0,00
	Marine Transportation	0,77	0,69	0,77	3,42	3,14	2,86	-2,52	-3,24	-2,08
	Railroads	2,82	1,7	0,91	7,95	4,05	1,42	0,61	0,62	0,62
	Transportation service	16,38	15,36	-2,37	77,95	82,42	3,90	0,50	0,57	-14,21
	Trucking	0,00	-0,94	-0,79	0,00	0,00	0,07	0,00	-2,92	-2,25
S&P TSX	Marine Transportation	0,79	1,20	0,77	1,19	1,81	1,15	0,00	0,00	0,00
	Railroads	1,35	1,33	0,84	1,96	1,95	1,06	0,74	0,70	0,62
	Railroads	0,52	0,91	0,52	0,52	1,51	0,85	0,52	0,30	0,19
WIG	Transportation service	1,89	1,42	1,42	1,89	1,42	1,42	1,89	1,42	1,42
	Total Debt to Market Cap Ratio									
Euro Stoxx	Delivery Service	0,26	0,3	0,35	0,85	0,63	0,98	0,00	0,01	0,01
	Marine Transportation	0,79	0,59	0,48	2,36	1,32	1,25	0,00	0,00	0,00
	Transportation service	0,70	0,71	0,70	2,7	2,62	3,34	0,00	0,00	0,00
Russell 3000	Delivery Service	0,45	0,55	0,32	1,42	1,87	1,57	0,00	0,00	0,00
	Marine Transportation	2,85	1,04	0,74	50,2	7,02	2,62	0,01	0,06	0,00
	Railroads	0,37	0,47	0,26	0,55	0,74	0,33	0,27	0,29	0,17
	Transportation service	1,61	1,74	1,35	5,42	5,23	4,56	0,46	0,48	0,42
	Trucking	0,32	0,36	0,27	1,13	1,25	0,58	0,00	0,00	0,01
S&P TSX	Marine Transportation	0,23	0,41	0,24	0,34	0,61	0,36	0,00	0,00	0,00
	Railroads	0,23	0,25	0,14	0,31	0,33	0,15	0,16	0,17	0,13
	Transportation service	2,87	2,90	2,17	2,87	2,90	2,17	2,87	2,90	2,17
WIG	Railroads	0,80	0,60	0,38	0,81	0,89	0,59	0,79	0,32	0,17
	Transportation service	1,04	1,04	0,70	1,04	1,04	0,70	1,04	1,04	0,70

Fig. 9.7. DuPont indicators for the four Market Index.

Source: Author's calculations.

## 4. Conclusions

The analysis of the changes to the liabilities-side of the statement of financial position can assess the efficiency of business models of TSL companies in time of important economic downturn or high market volatility. The analysis is valid for both the so-called dot-com bubble of the 2000s as well as for the global economic slowdown of the years 2008+. However it should be further enhanced using DuPont ratios analysis in order to assess the dynamics of the changes to the different categories of liabilities.

The impact of the dot-com bubble on TSL entities varies not only as a function of their subsequent ICB sector but also on the market indices they belong to. A clearly negative impact of the first economic crisis can be seen on entities belonging to both Russell 3000 and Stoxx All Europe 800 entities. This is especially true for companies making up Marine Transportation and Delivery Service. In the case of S&P TSX entities, the impact of the crisis on the structure of their liabilities seems to be least important as the only affected ICB subsector being Railroads. A major difference between companies listed on the various stock exchange can be seen in the net change in access to external equity financing. Whenever all the companies are deleveraging in 2002, in the subsequent years, Stoxx All Europe 800 entities from 2003 onwards note positive inflows in this category. By contrast both Russel 3000 and S&P TSX entities are noting a deficit in this form of liquidity for their business model.

In case of the global slowdowns of the years 2008+, the impact on TSL companies is more differentiated. The four major markets reacted differently in both net changes to total liabilities (as well as in the case of the major three components) as well as methods of providing liquidity (through the use of equity financing or reinvested earnings). This shows the different potential of entities making up the four market indices. Additionally an analysis of ICB subsectors shows clearly that some sectors were more resilient to market conditions than others. A subsector that clearly stood out was Transportation service. Its performance was above average for both Russell 3000 as well as Stoxx All Europe 800, but lacked some effects in the case of S&P TSX.

Additional insight into the cost-effectiveness of the business models can be obtained through the use of DuPont economic ratios. The results obtained point clearly that access to long term capital (that can be traced back to the size of the market) has indeed a clear impact on the individual entities economic efficiency.

However the results obtained for the four major market indices should be seen as a warrant for further research in this field. Additional consideration should be

given to increasing the size of the analysed population. This is especially true in the case of European stocks. The number of TSL-entities in the Stoxx All Europe 800 index is not as important as in the American Russell 3000 market index. Additionally further analysis should also concern the use of GICS or BICS instead of ICB in order to identify TSL entities.

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