The hypothesized relationship between recycle strategy and organizational performance is positive and significant with an estimate of 0.59 and a t-value of 5.72, which recommended the acceptance of the first hypothesis. To test the effect of resources allocation as a mediator on the hypothesized relation between recycle strategy and organizational performance, the author carried out two regression analyses where the predictor variable (recycle strategy) and moderator variable (resources allocation) were entered in the first step and the interaction of the predictor and the relevant interaction term was entered second. Similarly, two other regression analyses were carried out with reference to profitability and sales growth. The results are presented in Table 6.

Table 6. Moderating effect of resource allocation

			o. Moderann					
Regressi	on of environmen	ntal outcome	s on resource	allocation a	nd recycle str	ategy		
Step	Variable entered	R ²	Adjusted R ²	ΔR^2	ΔR ² Sig	b	βα	Sig
1	Resources Allocation					-0.435	-0.322	0.069
	Recycle Strategy	0.685	0.683			0.229	0.191	0.412
2	$RA \times RS$	0.687	0.68	0.051	0.011	0.150	0.854	0.91
Regressi	on of profitability	y on resource	e allocation an	d recycle st	rategy	•		
Step	Variable entered	R ²	Adjusted R ²	ΔR^2	ΔR ² Sig	b	βα	Sig
1	Resources allocation					0.271	0.181	0.528
	Recycle Strategy	0.029	0.18			0.498	0.188	0.285
2	$RA \times RS$	0.031	0.13	0.001	0.502	-0.52	-0.376	0.503
Regressi	on of sales growt	th on resource	e allocation ar	nd recycle s	trategy	•		
Step	Variable entered	R ²	Adjusted R ²	ΔR^2	ΔR ² Sig	b	βα	Sig
1	Resources allocation					0.741	0.667	0.000
	Recycle Strategy	0.681	0.676			-0.372	-0.315	0.067
2	$RA \times RS$	0.683	0.676	0.003	0.287	0.042	0.189	0.288

^a Coefficients from the final step

As shown in Table 6, the interaction of resource allocation and recycle strategy was significant in all the different the case of environmental outcomes (β =0.854; p < 0.01) explaining 5.1% of its variance. According to the previous results, the second hypothesis was partially accepted.

6. Discussion and Conclusions

The main outcome of the current study is that recycle strategy has a direct and significant effect on organizational performance. On the other hand, resource allocation moderates only the relation between recycle strategy and environmental outcomes. The previous results are consistent with the conclusion reached by Skinner et al., 2008, which states that repair and disposal strategies have a direct impact on the level of performance. In addition, they are consistent with the results of Khor and Udin (2012), which state that repair and recycling strategy has a direct impact on the company's profitability with the presence of resources allocation as a moderator variable that governs this relation.

According to Schulze et al. (2014), a large percentage of purchased goods in the household industries will be returned, which will affect profit, so companies need to use different disposition strategies to reclaim a part of the returned product cost. The current research finding supports the effect of used dispositions strategies (recycle) in the paper industry on performance. The working companies in the Egyptian paper industry should continue to use recycle

strategy as a tool for gaining a competitive advantage through reducing cost and improving performance. In addition, the companies need to allocate adequate resources for such strategy to make sure of its effectiveness.

The current study is one of the few studies in Egypt that evaluated the relation between one of the strategies of disposition and performance levels and also tackled the impact of resource allocation in this relation. Nevertheless, one of its points of weakness is its application on one industrial sector only. Hence, the hypotheses of the study must be reassessed and reapplied to different industrial sectors to form a clear image of the nature of the relation between the variables of the study in Egypt. In addition, this study has not taken into account external environmental variables such as laws and governmental legislations, which have an impact on the given relations between the variables of the study.

Finally, a number of recommendations could be set with the aim of attracting attention to disposition strategies and their impact on the environment:

- 1-The state and its institutions must set a number of mechanisms and legislations to contribute to the application and usage of different disposition strategies due to their positive effect on the environment.
- 2-Non-governmental organizations in Egypt must raise awareness of the importance of protecting the environment and its impact on the level of performance and profitability of companies.
- 3-The private sector and its different companies should work on passing on the experiences of companies in developed countries and the technologies used in handling dispositions in a way that maintains the environment.

References:

- Agrawal S., Singh R. K., Murtaza Q. (2015) 'A literature review and perspectives in reverse logistics', *Resources, Conservation and Recycling*, Vol. 97, No. 4, pp. 76-92.
- Ahire, S. L., Golhar, D. Y. and Waller, M. A. (1996) 'Development and validation of TQM implementation constructs', *Decision Sciences*, Vol.27, No.1, pp.23–56.
- Barney, J. (1991) 'Firm Resources and Sustained Competitive Advantage', *Journal of Management*, Vol.17, No. 1, pp.99-120.
- Blackburn, J. D., Guide, V. D. R., Souza G. C. and Van Wassenhove, L. N. (2004) 'Reverse Supply Chains for Commercial Returns', *California Management Review*, Vol.46, No. 2, pp.6-22.
- Caldwell, B. (1999) 'Reverse Logistics', Information Week, April, No.12, pp.48-52.
- Closs, D.J. and Xu, K. (2000) 'Logistics Information Technology Practice in Manufacturing and Merchandising Firms', *International Journal of Physical Distribution & Logistics Management*, Vol.30, No.10, pp.869-86.
- Conner, K.R. (1991) 'A Historical Comparison of Resource-Based Theory and Five Schools of Thought Within Industrial Organization Economics: Do We Have a New Theory of the Firm?', *Journal of Management*, Vol.17, No.1, pp.121-54.
- Correa, H. and Xavier, L. (2013) 'Concepts, design and implementation of Reverse Logistics Systems for sustainable supply chains in Brazil', *Journal of Operations and Supply Chain Management*, Vol.6, No.1, pp.1-25.
- Daft, R. (1983) Organizational Theory and Design, West, New York, NY.
- Das, T.K. and Teng B.S. (2000) 'A Resource-Based Theory of Strategic Alliances', *Journal of Management*, Vol.26 No.1, pp.31-61.
- Daugherty, P.J., Autry C.W. and Ellinger A.E. (2001) 'Reverse Logistics: The Relationship between Resource Commitment and Program Performance', *Journal of Business Logistics*, Vol.22, No.1, pp.107-124.
- El-Nakib, I. (2012). 'Reverse logistics: A comparison of electronic waste recycling between Switzerland and Egypt', Paper presented at the Global Conference in Operations and Supply Chain Management (GCOM 2012), 12-13march, Bandung, Indonesia, available at: http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2053344 (accessed15 October 2014).
- Fernandez, I., Puente, J., Garcia, N. and Gomez A. (2008) 'A Decision-Making Support System on a Products Recovery Management Framework: A fuzzy Approach', *Concurrent Engineering: Research and Applications*, Vol.16, No.2, pp.129-138.
- Garver, M. S. and Mentzer, J. T. (1999) 'Logistics research methods: Employing structural equation modeling to test for construct validity', *Journal of Business Logistics*, Vol.20, No. 1, pp.33–57.
- Gehin, A., Zwolinski, P. and Brissaud D. (2008) 'A Tool to Implement Sustainable End-of-Life Strategies in the

- Product Development Phase', Journal of Cleaner Production, Vol.16, No.5, pp.566-576.
- Govindan, K., Soleimani, H. and Kannan, D. (2014) 'Reverse logistics and closed-loop supply chain: A comprehensive review to explore the future', *European Journal of Operational Research*. Vol.240, No.3, pp.603-626
- Greve, C. and Davis, J. (2012) An executive's guide to reverse logistics. 1st ed., Greve Davis Publishing, Inc., Pittsburgh, Pennsylvania.
- Guide, V. D. R., Jayaraman, V., Srivastava, R. and Benton W. C. (2000) 'Supply Chain Management for Recoverable Manufacturing System', Interfaces, Vol.30, No.3, pp.125-142.
- Guide Jr, V. and Van W. L. (2009) 'OR FORUM-the evolution of closed-loop supply chain research', *Operations Research*, Vol.57, No.1, pp.10-18.
- Guide, V. D. R. J. and Van Wassenhove L. N. (2003) Business Aspects of Closed Loop Supply Chains, Carnegie Mellon University Press, Pittsburgh, Pennsylvania.
- Hazen, B. (2011) 'Strategic reverse logistics disposition decisions: from theory to practice', *International Journal of Logistics Systems and Management*, Vol.10, No.3, pp.275-292.
- Huscroft, J. R., Hazen, B. T., Hall, D. J., Skipper, J. B. and Hanna, J.B. (2013) 'Reverse logistics: past research, current management issues, and future directions', *The international journal of logistics management*, Vol.24, No. 3, pp.304-327.
- Ijomah, W. L., McMahon, C. A., Hammond, G. P. and Newman S. T. (2007) 'Development of Design for Remanufacturing Guidelines to Support Sustainable Manufacturing', *Robotics and Computer-Integrated Manufacturing*, Vol.23, No.6, pp.712-719.
- Janse, B.J.M. (2008) Exploiting improvement potential in managing reverse logistics: trends and management practices in the European consumer electronics industry, *viewed* 0 4/08/2014, http://essay.utwente.nl/59150/1/scriptie_B_Janse.pdf
- Jayaraman, V. (2007) 'Creating competitive advantages through new value creation: a reverse logistics perspective', *Academy of Management Perspectives*, Vol.21, No.2, pp. 56-73.
- Kenny, DA. (2012) Multiple factor models: Confirmatory factor analysis. Available at http://davidakenny.net/cm/mfactor.htm
- Khor, K. S. and Udin Z. M. (2012) 'Impact of Reverse Logistics Product Disposition towards Business Performance in Malaysian E&E Companies', Journal of Supply Chain and Customer Relationship *Management*, Article ID 699469, pp.1-19.
- Kline, R. B. (1998) Principles and practice of structural equation modeling, New York, NY: Guilford Press.
- Koufteros, X. A. (1999) 'Testing a model of pull production: A paradigm for manufacturing research using structural equation modeling', *Journal of Operations Management*, Vol.17 No.4, pp.467–488.
- Kumar, S. and Putnam V. (2008) 'Cradle to Cradle: Reverse Logistics Strategies and Opportunities across Three Industry Sectors', *International Journal of Production Economics*, Vol.115, No.2, pp.305-315.
- Martinez, R. (2009) Best Practices in returns management, viewed 01/09/2014,
 - http://www.multichannelmerchant.com/opsandfulfillment/1201-best-practices-returns-management
- Mollenkopf, D. and Weathersby H. (2003) 'Creating Value through Reverse Logistics', *Logistics Quarterly*, Vol.9, No.3, pp. 20-24.
- Morgan, N.A., Kaleka, A. and Katsikeas C.S. (2004) 'Antecedents of Export Venture Performance: A Theoretical Model and Empirical Assessment', *Journal of Marketing*, Vol.68, No.1, pp.90-108.
- Norek, C.D. (2003) 'Throwing It into Reverse', DC Velocity, Vol.1, No.1, pp.54-8.
- Nuss, C., Sahamie, R. and Stindt, D. (2014) 'The Reverse Supply Chain Planning Matrix: A Classification Scheme for Planning Problems in Reverse Logistics', *International Journal of Management Reviews*, doi: 10.1111/ijmr.12046 Peteraf, M. (1993) 'the Cornerstones of Competitive Advantage: A Resource-Based View', *Strategic Management Journal*, Vol.14, No. 3, pp.179-91.
- Petersen, J. A. and Kumar, V. (2010) 'Can Product Returns Make You Money?', MIT Sloan Management Review, Vol. 51, No. 3, pp. 85-89.
- Prahinski, C. and Kocabasoglu C. (2006) 'Empirical Research Opportunities in Reverse Supply Chains', *The International Journal of Management Science*, Vol.34, Vol.6, pp.519-532
- Roenisch, S. (2013) Onlinehandel: Wege aus dem Retourendilemma, viewed 01/09/2014, http://www.ibusiness.de/members/aktuell/db/581766SUR.html
- Rogers, D., Melamed, B. and Lembke, R. (2012) 'Modeling and analysis of reverse logistics', *Journal of Business Logistics*, Vol.33, No.2, pp.107-117

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- Rogers, D. S., Rogers, Z. S. and Lembke R. (2010) 'Creating Value through Product Stewardship and Take-Back', Sustainability Accounting, Management and Policy Journal, Vol.1, No.2, pp/133-160.
- Schatteman, Olaf (2006) Reverse Logistics, viewed 09/08/2014,
 - https://www.ashgate.com/pdf/SamplePages/ghsupplych2.pdf
- schulze, c., el kihal, s. and skiera, b. (2014) Product Return Management for Online Retailers. In: *The 4th Theory + Practice in Marketing (TPM) Conference*.
- Skinner, L. R., Bryant, P. T. and Richey, R. G. (2008) 'Examining the Impact of Reverse Logistics Disposition Strategies', *International Journal of Physical Distribution & Logistics Management*, Vol.38, No.7, pp.518-539.
- Slater, S.F. and Olson E.M. (2000) 'Strategy Type and Performance: The Influence of Sales Force Management', *Strategic Management Journal*, Vol.21, No.8, pp.813-29.
- Stock, J., Boyer, S. and Harmon, T. (2010) 'Research opportunities in supply chain management', *Journal of the Academy of Marketing Science*, Vol.38, No.1, pp.32-41
- Thierry, M., Salomon, M., Van Nunen, J. and Van Wassenhove, L. (1995) 'Strategic Issues in Product Recovery Management', *California Management Review*, Vol.37, No.2, pp. 114-135.
- Trebilcock, B. (2001) 'Why Are Returns So Tough?', Modern Materials Handling, Vol.56, No.11, pp.45-51.
- Xie, Y. and Breen, L. (2012) 'Greening community pharmaceutical supply chain in UK: a cross boundary approach', *Supply Chain Management: An International Journal*, Vol.17, No.1, pp. 40-53.

Biography

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