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The Impact of Green Logistics-Based Activities on the Sustainable Monetary Expansion Indicators of Oman

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Abstract:

Purpose: The purpose of this study is to examine green logistics activities using a three-axis approach (financial-economic, social and environmental activities) and how these activities affect the sustainable monetary expansion indicators for the Sultanate of Oman.

Design/methodology/approach: This study begins by defining elements of green logistics and how this concept has evolved in recent years. This concept is analyzed after surveying previous studies on green logistics. The independent variables of green logistics are threefold: financial-economic, social and environmental, and are applied to clarify the impact on monetary expansion indicators (broad, narrow and reserve money), which are important indications for determining the economic condition of a country. This study used data published in the annual statistical report by the Central Bank of Oman as representative of the economic condition of the Sultanate of Oman during the period 2008 to 2015.

Findings: Two variables within the environmental activities were found to be statistically significant at 1% and 5%: government support to the electricity sector (GSE) and subsidy on soft loans to the private housing sector (SSLPH). Only one variable (transport and communication (TC)) within the financial-economic activities was statistically significant at 1% and 5%, but all variables (community, social and personal (CSP) relations; cultural and religious affairs (CRA); and social security and welfare (SSW)) within the social activities were statistically significant at 1%, 5% and 10%. Finally, a multiple regression test was also performed on all the variables within the

green logistics activities and all the monetary expansion indicators, and they were found to be statistically significant at 1% and 5%. The study recommends that attention should be given to financial-economic activities as a quantitative standard that contributes to developing green logistics. This would entail a diagnosis of the priorities and the existing economic and financial system that contributes to sustainable development of the country's economy. It would also be important to activate the industrial sectors by reducing operating costs and improving the quality of service provided to customers, an indicator of the social activities that conform green logistics, and to increase corporate awareness of the environmental variables and the behavior of consumers in order to establish a financial-economic system based on the concept of green logistics.

Research limitations: The available data in the annual statistical report for Oman is limited, which limits the period and all the variables of the study.

Practical implications: The management of companies should be adopting green logistics operations if they compare the results of the concepts considered in this study with those of their competitors in the market, in order to consolidate their position in the market. Furthermore, the concept of green logistics helps companies build an intellectual model that contributes to enhancing added value. The results of this study enhance the stability of monetary expansion indicators reflecting economic growth.

Social implications: Green logistics plays a behavioral role in the company's and country's performance and determines the trends and attitudes for the future growth of companies, especially regarding the environmental indicators.

Originality/value: This study aims to analyze green logistics in the financial-economic, social and environmental areas, which reflect the greatest variations, especially as they are affected by changes in global markets, particularly with respect to oil prices, the main source of revenue for the Sultanate of Oman. This is of particular interest as green logistics is one of the modern concepts that are influencing the development of corporate strategies to implement economic plans in the country. This study has also supplied a conceptual research framework to explain green logistics in preparation for many future studies that will examine its elements.

Keywords: green logistics activities, monetary expansion, sustainable development, sultanate of Oman

1. Introduction

In recent years, increased interest has been observed in influencing the financial-economic, social and environmental activities, whose impact in the economy could be extended to the macro level, prompting the government's interest in implementing procedures and policies to try and mitigate the environmental impact and to preserve the resources in order to contribute to an increase in the gross domestic product and add economic value to the country in the form of interesting companies (Hans, 2011). The private sector has also dedicated more effort to developing strategies to deal with an environmental crisis, through attention to green logistics and different actions aimed to preserve both the institution and the country's resources (Diabat & Govindan, 2011).

Increasing globalization has led to companies intensifying their efforts to integrate their activities, and in this regard, the environment has taken on greater importance and provides an indication of the keys to success or failure, depending on a company's accuracy in the analysis of environmental elements. Provisions must be made for potential losses, and therefore an increase awareness is required of the environmental conditions that can occur, which may affect the economic development of the country's monetary and fiscal policy (McKinnon, Browne & Whiteing, 2010). Companies integrate activities from various industrial, financial, service and insurance sectors within the green logistics channel, involved in the formulation of a monetary policy. If there is a strong supply chain, there may also be a strong cash index that contributes to building the country's economy (Markley & Davis, 2007).

Since the operations and corporate policies threaten the environment if they are beyond control, thus producing negative environmental indicators, companies play an important role in pressing for appropriate environmentally-friendly operating processes that are consistent with the competitive environment in the market. Accordingly, companies must deal with internal and external factors in green logistics that impact them greatly (Kleindorfer, Singhal & Van Wassenhove, 2005).

The aim of green logistics is to reduce logistics costs and increase profits in order to maintain sustainable development; in other words, it affects the financial statements, by taking into account the cost element, the cost components and their direct impact on corporate profitability (Piecyk & Alan, 2010).

The modern crises that occurred affected the companies and the countries that are planning for sustainable development, to prevent the waste and loss of resources, in order to attain a green economy. However, it is also the social responsibility of all individuals, companies and sectors of government to play a part in the integration and interaction of all activities, in order to build a green economy through green logistics (Kumar, 2015).

Logistics is a tool to move goods, materials and people from one place at a specific time to another place at another time. It is considered relevant for operations in modern systems, not only at a local level, but also at an international level, where we observe a decentralization and globalization of logistical support in the development of products and services within the supply chain, an indicative of green logistics, according to which the optimal use of the costs and time is important in order to add real value to the economy and finance at the macro level (Lehtonen, 2004).

The evolution of technology quickly led to an imbalance in the ecological area, and therefore a lack of awareness of the concept of social environment. However, the recent years have witnessed an increased importance of the social environment, which has become a key element in green logistics, and the appearance and evolution of the economic and financial sectors, which have taken on an important, vital role in a country's monetary and fiscal policy. This is because they are the components of the output of governmental decisions, and they also influence the societal behavior toward economic decisions (Monnet, 2008).

The basic elements of the modern concept of green logistics are time and costs, which interact with one another in the environment in order to produce products according to an optimal method, and to distribute the products at the lowest cost and in the shortest time possible, while reducing the rate of product damage and loss and working on recycling waste to achieve an optimal use (Kumar, 2015).

This study aims to integrate, coordinate and use the data published in the annual statistical report by the Central Bank of Oman as representative of the economic situation in the Sultanate of Oman during the period 2008 to 2015. The intent is that the effective and efficient use of the supply chain will reduce the operating costs of any part of the cash concept within the green logistics concept. This study contributes to establishing, as part of a philosophical concept, the importance of green logistics activities in building a strong economy based on the fiscal and monetary policy of the country. This study will examine the three components of green logistics which contribute to cost reduction. The study is organized into six sections; after the introduction, the study explains green logistics and sustainable monetary expansion, and then presents a literature review, followed by the methodology, empirical results and discussion. Finally, the conclusions are presented.

2. Green Logistics and Sustainable Monetary Expansion

Green logistics is based on the administrative policies of supply chain production and how to achieve sustainable monetary development considering the related administration, proper management and the transfer of resources between companies and market sectors in order to reduce costs (Rodriguez, Slack & Comtois, 2001). Green logistics represents all activities that provide information for the purposes of consumer goods production about all specifications wished by the consumer and needed for their conversion, and strive to increase market demand (Lee & Klassen, 2008).

Green logistics is a measurement of business activity through the integration of elements of supply chain management, which contribute the added value of environmental performance (Bin & Chaoyuan, 2005). Green logistics can also be defined in terms of the integration among private, operational, strategic, local and global elements, in terms of government intervention as representative of the general government sector, in terms of pressure on the private sector to contribute to the construction of the financial-economic sector and to solve public sector problems and support it, and in terms of the integration of different sectors with one another, which also means observing the operational processes of the other sectors and adapting them to the elements and principles of the particular environmental strategy. Over the long term, all of these contribute to building the economy; here is where a third perspective comes in, a view that looks beyond the local context to the larger global framework (McKinnon et al., 2010). Green logistics refers to activities which measure the environmental impact of the distribution of products and services, and look for strategies which mitigate damage, leading to sustainable development (Sibihi & Eglese, 2009).

Green logistics is a cutting-edge concept defined as the production and distribution of products in the market so that environmental, social and financial-economic components are taken into account in the process of sustainable development. Some researchers, such as Turkay and Funda (2011) and Sibihi and Eglese (2009), explain green logistics as an intensification of efforts to find methods, standards and criteria to reduce costs and achieve a balance among the three elements (environmental, social and economic components). In recent years, the reverse logistics concept has emerged; it considers the flow of products and services to the customer before they are supplied to the market, which leads to lower costs in terms of both time and resources. Thus, reverse logistics is naturally included within the concept of green logistics, and we can see that it stimulates considerations in different environments for inclusion within the green logistics concept (Pagell & Wu, 2009).

Reverse logistics includes reducing operational costs, and saving money and increasing value by reselling or recycling resources in the environment in order to cover any potential losses or operational costs (Voigt & Thiell, 2004). Green logistics focuses on eco-friendly resources and saving money to create an

image of the company in the market. Therefore, as indicated by Hans (2011), green logistics flows forward within the supply chain, while reverse logistics refers to sustainable development. Along these lines, Voigt and Thiell (2004) equates green logistics to ecological logistics by examining the environmental impact of reducing consumption costs for products and services, hence the integration of reverse logistics with green logistics, through the recycling, re-use and re-industrialization of resources, which effectively contribute to harmonizing the impact in this economically efficient environment.

3. Literature Review

The green supply chain has grown in recent years in the business sector, in response to increased challenges in logistics management. The result has been green logistics management in the supply chain and sustainable development. We see that green logistics focuses on product design and development according to competitive standards in terms of price, features, quality, etc. In other words, green logistics contributes to internal and external resource management, including risk management and cooperation with suppliers to manage the supply chain. Voigt and Thiell (2004) indicated that reverse logistics covers many goods transferring and storage costs and adds value to the service over the lifetime of the product and the company through continuity of the quality of raw materials and effectively testing that goods are produced and distributed to consumers efficiently. Bin and Chaoyuan (2005) understood logistics operations to symbolize the administrative integration of all activities to produce the goods to be marketed within the supply chain, while continuing to reduce costs and thus favor the cash market.

Meade, Sarkis and Presley (2007) explained a significant aspect of reverse logistics, according to which many companies bear the responsibility in terms of the products in the market so as to meet the desires and needs of consumers, thus achieving a high degree of persuasion and loyalty to the product, especially over the long term. Meanwhile, Lewis and Fitzpatrick (2007) analyzed the industry in terms of the pressure on companies in general to reduce operating costs and losses by stimulating the recycling of products, which works to contribute an added value to the operational process.

The study by Carter and Rogers (2008) indicated that the environmental and social activities are a positive move towards green logistics, but so is the integration of economic activities, so as to achieve a competitive advantage for the company, helping it to grow and survive in the market. Pagell and Wu (2009) emphasized that sustainable development will continue in the companies, thanks to the administrative examination practices that lead to the good management of the supply chain, which is a combination of financial-economic and social activities, thereby achieving the goals of the green logistics concept. Thiell (2010) indicated that green logistics includes activities related to effective management which act on the flow of products and information from the point of origin to consumers, in an effort to

meet consumer demands. Fischer (2011) explained that the transport sector represents a great challenge in terms of the technology and the building of the infrastructure of the economy in any country. Therefore, the market is always variable, and thus making reference to the environment is an important activity in the planning of green logistics.

Gold and Seuring (2011) indicated that sustainable development is part of green logistics, which companies seek to take into account in terms of creativity at work and the differentiation of action in order to achieve competitiveness in the market and improve the quality of services provided to customers. McKinnon, Cullinane, Browne and Whiteing (2012) claimed that the green logistics indicators include good governance and building relationships with the market, for the purposes of developing alternatives and trying to adapt to environmental crises, in order for companies to lay the foundation for continuity and growth. Jakubauskas (2012) indicated that the production system of the companies determines the level of well-being at work, which reflects positively on the performance achieved by green logistics. Stolka (2014) found that the environmental component of green logistics is the most influential factor in sustainable development, and that resources must be consistent with the goals of organizations. Kumar (2015) explained that the environmental component of green logistics provokes changes in the decision-making processes in companies, and these contribute to the development of the concept of sustainable development.

After perusing the literature review, we can classify these studies in two groups: those such as the works by Stolka (2014), McKinnon et al. (2012) and Carter and Rogers (2008), which found that corporate managers must take into account environmental standards in the construction of corporate strategies that could undergo constant change, according to the development environment; and those by Kumar (2015), Gold and Seuring (2011), Pagell and Wu (2009) and Bin and Chaoyuan (2005), which found that the determinants of green logistics vary from company to company, depending on the activity sector, geographical location and level of environmental requirements. Furthermore, there is the study by Voigt and Thiell (2004), which found that important factors in determining a company's behavior are environmental pressures and the associated development of different companies in the environment. Recent studies such as that by Kannan, Khodaverdi, Olfat, Jafarian and Diabat (2013), have noted that the best green logistics provider is the one who offers a suitable price, high quality service, and environmental safety; together, all these factors provide for green products in a company. Chung, Chao and Lou (2016) explained that environmental regulations, finance sources and technological competence are the drivers of green logistics in companies, in terms of sustainability. Wang, Ho, Luo and Lin (2017) demonstrates that there are specific industrial sectors that show positive signs in terms of technical aspects and the effects of green logistics, resulting in high levels of efficiency.

We see that the important operational and technological processes must be taken into account when thinking about incorporating green logistics, as customer and corporate awareness of delivering a high-quality product also contributes to the provision of green logistics. Finally, the legislation and laws of a country and the extent of their flexibility also reflects the image of integration and interaction of companies in the market in terms of green logistics.

This study contributes to the enrichment and enhancement of the previous literature on the concept of green logistics, in that this study characterizes the previous literature in order to analyze all the elements of green logistics that contribute to the economic growth of the country, based on building a balanced and strong monetary policy. It also shows the government's role in supporting environmental and social sector factors that will lead to lower costs and enhance the added value.

4. The Study Methodology

Empirical methodology is used to test the hypotheses of this study problem. This study used data from all sectors of the economy in Oman. This study used 8 years of data published in a statistical annual report from the Central Bank of Oman 2008-2015 as representative of the economic condition of the Sultanate of Oman during the period 2008 to 2015.

4.1. Study Hypotheses

After review of the literature, it became evident that many studies, such as those by Pagell and Wu (2009), Kumar (2015) and Thiell (2010), used many different variables, locations and equations. Based on these previous studies, I designed 12 equations explaining the independent variables to measure green logistics activities considering as dependent variables the sustainable monetary expansion indicators, in order to test the following hypothesis statements:

> ***HO-1:*** *The impact of each type of green logistics activities (financial-economic, social and environmental) and the M2 broad money indicator as the monetary expansion indicator in the Sultanate of Oman.*
>
> ***HO-2:*** *The impact of each type of green logistics activities (financial-economic, social and environmental) and the M1 narrow money indicator as the monetary expansion indicator in the Sultanate of Oman.*
>
> ***HO-3:*** *The impact of each type of green logistics activities (financial-economic, social and environmental) and the reserve money indicator as the monetary expansion indicator in the Sultanate of Oman.*

HO-4: *The impact of all the variables of each type of green logistics activities (financial-economic, social and environmental) and all the monetary expansion indicators (M2 broad money, M1 narrow money and reserve money) in the Sultanate of Oman.*

4.2. The Variables and Equations

4.2.1. Study Variables

The study variables were collected from the 8 years of data published in the annual statistical report by the Central Bank of Oman (2008-2015). The dependent variables of the sustainable monetary expansion indicators (SMEI) are measured by the M2 broad money indicator, measured by the M1 narrow money indicator and short-term deposits in banks and certain money market funds; the M1 narrow money indicator, measured by coins and notes that are in circulation and other money equivalents that can be easily converted into cash; and the reserve money indicator, measured by M2 and long-term deposits. The three independent variables of green logistic activities (GLA) are measured by the following:

- **Financial-economic activity, as measured by:** data on mining, manufacturing and construction (MMC); transport and communication (TC); and fuel and energy (FE).
- **Social activity, as measured by:** data on community, social and personal (CSP); cultural and religious affairs (CRA); and social security and welfare (SSW).
- **Environmental activity, as measured by:** data on government support to electricity sector (GSE);, subsidy on soft loans to the private housing sector (SSLPH); and participation in domestic, regional and international interests (PDRII).

4.2.2. Study Equations

To test the hypotheses, the study formulized these following equations:

$BM_{it} = \alpha_0 + b_1\ GSE_{it} + b_2 SSLPH_{it} + b_3 PDRII_{it} + \varepsilon_{it}$	H0-1	(1)
$BM_{it} = \alpha_0 + b_1\ MMC_{it} + b_2 TC_{it} + b_3 FE_{it} + \varepsilon_{it}$		(2)
$BM_{it} = \alpha_0 + b_1\ CSP_{it} + b_2 CRA_{it} + b_3 SSW_{it} + \varepsilon_{it}$		(3)
$NM_{it} = \alpha_0 + b_1\ GSE_{it} + b_2 SSLPH_{it} + b_3 PDRII_{it} + \varepsilon_{it}$	H0-2	(4)
$NM_{it} = \alpha_0 + b_1\ MMC_{it} + b_2 TC_{it} + b_3 FE_{it} + \varepsilon_{it}$		(5)
$NM_{it} = \alpha_0 + b_1\ CSP_{it} + b_2 CRA_{it} + b_3 SSW_{it} + \varepsilon_{it}$		(6)

$RM_{it} = \alpha_0 + b_1\ GSE_{it} + b_2 SSLPH_{it} + b_3 PDRII_{it} + \varepsilon_{it}$	H0-3	(7)
$RM_{it} = \alpha_0 + b_1\ MMC_{it} + b_2 TC_{it} + b_3 FE_{it} + \varepsilon_{it}$		(8)
$RM_{it} = \alpha_0 + b_1\ CSP_{it} + b_2 CRA_{it} + b_3 SSW_{it} + \varepsilon_{it}$		(9)
$SMEI_{it} = \alpha_0 + b_1\ FEGLA + \varepsilon_{it}$	H0-4	(10)
$SMEI_{it} = \alpha_0 + b_1\ SGLA + \varepsilon_{it}$		(11)
$SMEI_{it} = \alpha_0 + b_1\ ENGLA + \varepsilon_{it}$		(12)

Where BM_{it} = M2 broad money; NM_{it} = M1 narrow money; RM_{it} = reserve money; and $SMEI_{it}$ = sustainable monetary expansion indicators. The latter is divided into three equations, as follows: financial-economic green logistics activities ($FEGLA_{it}$), social green logistics activities ($SGLA_{it}$) and environmental green logistics activities ($ENGLA_{it}$)

5. Empirical Results and Discussion

5.1. Simple Regression Analysis

Table 1 tests the first three equations by simple regression analysis, using an OLS test. * Significant at ($p < 0.10$), ** significant at ($p < 0.05$), *** significant at ($p < 0.01$) for the analysis of the impact of each green logistics activity (environmental, financial-economic and social) on the M2 broad money indicator, considered to be the monetary expansion indicator for the Sultanate of Oman. The results of the study explain the high significance of all social activities at 1% and 5%. Two environmental activities also are significant at 1%, but only one financial-economic activity, transport and communication (TC), is significant at 1%. Finally, the correlation is high between variables, from 72% to 94%, while the coefficient of determination (R^2) is between 51% and 89%. These results demonstrate that the activities in the social and environmental sectors are considered effective in influencing monetary policy activities with regard to money supply in the market; these are the green logistics activities that provide effective money supply control, which confirms to the need for the government to pay attention to these activities. Meanwhile, financial-economic activities have had a weaker influence on the expansionary monetary policy in the market.

Ind. Var.	Ind. Variables	R	R-Square	T-V	Significant	Un stand. Coefficient	
						STD-Error	Beta
Environment Activities	(GSE)	0.939	0.868	7.690	0.000***	4.082	31.392
	(SSLPH)	0.834	0.695	4.533	0.001***	101.155	458.500
	(PDRII)	0.458	0.210	1.547	0.156	4.954	7.663
Financial Economic Activities	(MMC)	0.239	0.057	0.739	0.479	439.733	324.968
	(TC)	0.910	0.828	6.581	0.000***	1.842	12.123
	(FE)	0.452	0.204	1.521	0.163	27.152	-41.287
Social Activities	(CSP)	0.945	0.893	8.668	0.000***	5.834	50.571
	(CRA)	0.838	0.702	4.610	0.001***	31.468	145.065
	(SSW)	0.721	0.519	3.117	0.012**	199.610	622.210

Table 1. Simple regression analysis of each green logistics activity and M2 broad money indicator as the monetary expansion indicator

Table 2 tests equations 4-6 by simple regression analysis to analyze the impact of each green logistics activity type (environmental, financial-economic and social) on the M1 narrow money indicator as the monetary expansion indicator for the Sultanate of Oman. The results of the study explain the high significance of all social activities at 1% and 5%. Two environmental activities also are significant at 1%, but only one financial-economic activity, transport and communication (TC), is significant at 1%. Finally, the correlation is high between variables, from 68% to 94%, while the coefficient of determination (R^2) is between 47% and 89%. The results can be explained as results of broad money, which is consistent with the composition of the money supply in the market; here we emphasize the importance of the transport and communications variable as an effective variable in influencing narrow money.

Ind. Var.	Ind. Variables	R	R-Square	T-V	Significant	Un stand. Coefficient	
						STD-Error	Beta
Environment Activities	(GSE)	0.933	0.870	7.770	0.000***	1.528	11.874
	(SSLPH)	0.851	0.724	4.862	0.001***	36.354	176.746
	(PDRII)	0.355	0.126	1.138	0.284	1.969	2.240
Financial Economic Activities	(MMC)	0.251	0.063	0.777	0.457	165.598	128.707
	(TC)	0.883	0.780	5.643	0.000***	0.787	4.444
	(FE)	0.462	0.214	-1.564	0.152	10.196	-15.947
Social Activities	(CSP)	0.946	0.894	8.723	0.000***	2.191	18.115
	(CRA)	0.854	0.729	4.923	0.001***	11.341	55.827
	(SSW)	0.689	0.474	2.851	0.019**	78.821	224.693

Table 2. Simple regression analysis of each green logistics activity and M1 narrow money indicator as the monetary expansion indicator

Table 3 tests equations 7-9 by simple regression analysis to analyze the impact of each green logistics activity type (environmental, financial-economic and social) on the reserve money indicator as the monetary expansion indicator for the Sultanate of Oman. The results of the study explain the high significance of all social activities at 1%, 5% and 10%. Two environmental activities also are significant at 1% and 5%, but only one financial-economic activity, transport and communication (TC), is significant at 5%. Finally, the correlation is high between variables, from 55% to 88%, while the coefficient of determination (R^2) is between 31% and 77%. The results can be explained in that the social activities have a disproportionate impact on the dependent variable, which, however, shows a significantly lower variance than the other previously presented dependent variables, and are less significant as compared to other activities.

Ind. Var.	Ind. Variables	R	R-Square	T-V	Significant	Un stand. Coefficient	
						STD-Error	Beta
Environment Activities	(GSE)	0.882	0.777	5.601	0.000***	2.031	11.378
	(SSLPH)	0.647	0.419	2.548	0.031**	53.512	136.335
	(PDRII)	0.282	0.080	0.883	0.400	2.048	1.808
Financial Economic Activities	(MMC)	0.510	0.260	1.779	0.109	149.218	265.434
	(TC)	0.696	0.484	2.907	0.017**	1.222	3.552
	(FE)	0.454	0.206	-1.527	0.161	10.392	-15.866
Social Activities	(CSP)	0.810	0.656	4.141	0.003***	4.009	16.601
	(CRA)	0.670	0.449	2.708	0.024**	16.404	44.426
	(SSW)	0.559	0.312	2.020	0.074*	91.461	184.764

Table 3. Simple regression analysis of each green logistics activity and reserve money indicator as the monetary expansion indicator

Although many of the studies previously discussed in the literature review have considered the concept of sustainable development from the perspective of the supply chain, the importance of the green logistics concept and its role in sustainable development (the logistic operations that integrate all management activities in the company to move products through the supply chain with the green logistics costs) is still weak. In order to implement green logistics, companies are using their entire assets and increasing the size of their business units, at the same time that they reduce the amount of time and the rate of loss.

Many companies have special reasons for establishing the concept of sustainable development within the green logistics concept, as the result of pressure by customers and the desire to promote the company's image and challenge the green competition in the market. Here, green logistics establishes the

financial-economic terms, improves consumer conversion and the relations with said consumers, and provides a positive image of a product or service. It also results in the planning and distribution of products in an optimal manner, which motivates employees to provide high levels of productivity and reduces taxes and other obligations, improving the investment portfolio and performance risks. As for the social aspect, companies attempt to reduce their environmental impact, improve the optimal use of resources, develop a culture centered on this concept, reduce social and health costs, improve the quality of life, create new jobs and provide a cleaner, more efficient environment based on creativity and innovation. Finally, the environmental side refers to environmental support from the government or the private sector in assisting the local community, through building planning and the stimulation of local business activities and sectors towards a level of productivity that is high enough to create a friendly and cooperative environment in terms of the development of scientific research, in order to achieve social and economic goals.

5.2. Multiple Regression Analysis

Table 4 tests equations 10-12 using multiple regression analysis to analyze the impact of all the variables of green logistics activities (environmental, financial-economic and social) and each monetary expansion indicator (M2 broad money, M1 narrow money and reserve money) listed for the Sultanate of Oman. The results show that all independent variables are significant in terms of each dependent variable of the monetary expansion indicators at 1% and 5%. Finally, the correlation is high between variables, from 82% to 96%, while the coefficient of determination (R^2) is between 68% and 92%.

Ind. Var.	Dependent Variables	R	R-Square	F- Value	Significant
Environment Activities	Broad Money M2 Indicator	0.961	0.924	28.424	0.000***
	Narrow Money M1 Indicator	0.953	0.907	22.837	0.001***
	Reserve Money Indicator	0.887	0.787	8.618	0.009***
Financial Economic Activities	Broad Money M2 Indicator	0.949	0.901	21.347	0.001***
	Narrow Money M1 Indicator	0.932	0.868	15.473	0.002***
	Reserve Money Indicator	0.918	0.844	12.590	0.003***
Social Activities	Broad Money M2 Indicator	0.953	0.908	23.160	0.001***
	Narrow Money M1 Indicator	0.958	0.918	26.009	0.000***
	Reserve Money Indicator	0.826	0.681	4.992	0.037**

Table 4. Multiple regression analysis of all variables of green logistics activities and each monetary expansion indicator

The results can be interpreted to explain that all variables strongly and significantly affect the dependent variable indicators of monetary expansion, which means that there is a strong and effective relationship between all activities undertaken by the country of Oman to, in an integrated and coordinated manner, construct its economy. This shows that the Sultanate of Oman follows a balanced approach between monetary and fiscal policy. We can also interpret that green logistics includes the four elements company, community, policies and customers, according to which customers want to obtain green products and services that meet their needs within a constantly changing environment. Therefore, there must be increased environmental awareness, in which supply and demand support green logistics in the market. This affects companies that are working to build policies in support of green logistics standards by understanding the customer's requirements and its image in the company and the community.

We can examine factors and determinants influencing green logistics and that can affect the environment, including the pressures by shareholders in terms of the environment, size and resources of companies in the industrial sector; the size; the geographical location; and the incentive managerial and administrative characteristics. Meanwhile, the obstacles to green logistics could be the lack of knowledge, skills, professional work, and foresight for the environmental and resource shortages, as well as the increasing costs of products and distribution.

6. Conclusion

This study analyzes green logistics activities based on financial-economic, social and environmental activities to show the impact on sustainable monetary expansion indicators, according to three variables: broad, narrow and reserve money, all of which have been collected from 8 years of data published in the annual statistical report showing the economic condition of the Sultanate of Oman during the period 2008-2015.

Simple and multiple regressions were performed in this study to test the four main hypotheses. The results found two variables, government support of the electricity sector (GSE) and subsidy on soft loans to the private housing sector (SSLPH) based on environmental activities, that were statistically significant at 1% and 5%. Only one variable, transport and communication (TC), in financial-economic activities, was statistically significant at 1% and 5%, but all variables, community, social and personal (CSP), cultural and religious affairs (CRA) and social security and welfare (SSW), in the area of social activities were statistically significant at 1%, 5% and 10%. Finally, the multiple regression test performed on all variables of green logistics activities and each monetary expansion indicator found there was a statistically significant relationship at 1% and 5%.

These results demonstrate the importance of the integration of green logistics activities with each other to build a strong monetary system that contributes to increasing the effectiveness and support of the government's activities. These results found that social and environmental activities have a more important effect than financial-economic activities in terms of green logistics to provide for the expansion of the monetary policy. Many previous studies discuss and focus on how to achieve green logistical elements. As an example, Lewis and Fitzpatrick (2007) focused on reducing operating costs, which helps improve performance and profitability, while Bin and Chaoyuan (2005) concentrated on the integration of administrative costs for the purpose of reducing the industrial process, and other studies, such as Pagell and Wu (2009) and Thiell (2010), proposed that there was a need to address administrative practices, which reflected positively on the green economic growth. Some studies discussed green logistics by focusing on improving the quality of the product for the purposes of customer satisfaction with the service or product provided (Meade et al., 2007). In another work, Voigt and Thiell (2004) said that the cost of raw materials is determinant in creating an appropriate pricing policy, which is aimed at pleasing customers. Carter and Rogers (2008) focused on the integration of industrial activities for the purposes of green logistics. In recent studies such as that by Fischer (2011), it has been noted that the element of technology is playing a vital role in increasing the competitive advantage achieved through logistics. McKinnon et al. (2012) explained the element of government relations and the extent of cooperation with companies within the country, as well as foreign relations, which determine the extent of development and green growth. Now, however, safety, the environment, price and the high quality of services have become important elements in achieving green logistics, according to Kumar (2015) and Kannan et al. (2013). Meanwhile, Wang et al. (2017) indicated that there are specific industrial sectors in which to achieve the green logistics concept. While the results of this study included the need to address and integrate all the elements of green logistics, environmental and social elements are especially relevant, as they influence monetary policy and economic growth.

The study recommends that attention should be paid to financial-economic activities as a quantitative standard that contributes to implementing green logistics by diagnosing the priorities and the existing economic and financial system that contributes to a system of sustainable development in terms of the country's economy. This occurs through supply chain management, and also through giving great importance to activating the industrial sectors in the market by reducing operating costs and improving the quality of service provided to customers as an indicator of the implementation of green logistics. Another factor is increased corporate awareness of environmental variables and the behavior of consumers, in order to establish a financial and economic system based on the concept of green logistics. Other variables can be used in future studies to examine the green logistics concept according to different methodologies.

References

Bin, S., & Chaoyuan, S. (2005). *The correlativity analysis between logistics industry and national economy development.* www.seiofbluemountain.com/upload

Carter, C.R., & Rogers, D.S. (2008). A framework of sustainable supply chain management: moving toward new theory. *International Journal of Physical Distribution & Logistics Management*, 38(5), 360-387. https://doi.org/10.1108/09600030810882816

Central Bank of Oman (2008-2015). *Annual Statistical Bulletin.* http://www.cbooman.org/ (Accessed: October 2016).

Chung, C.C., Chao, L.C.,& Lou, S.J. (2016). The Establishment of a Green Supplier Selection and Guidance Mechanism with the ANP and IPA. *Sustainability*, 8(259), 1-24. https://doi.org/10.3390/su8030259

Diabat, A., & Govindan, K. (2011). An analysis of the drivers affecting the implementation of green supply chain management. *Resources, Conservation and Recycling*, 55(6), 659-667. https://doi.org/10.1016/j.resconrec.2010.12.002

Fischer, R. (2011). *Brief background summary on the status of biofuels policy framework in South Africa* [online]. http://www.90x2030.org/oid%5Cdownloads%5C1%5C2_2_6_19_50_AM_biofuel_background_P90_RF.pdf

Gold, S., & Seuring, S. (2011). Supply chain and logistics issues of bio-energy production. *Journal of Cleaner Production*, 19(1), 32-42. https://doi.org/10.1016/j.jclepro.2010.08.009

Hans, I.W. (2011). *Green Supply Chains – a new priority for supply chain managers CSIR Built Environment.* http://researchspace.csir.co.za/dspace/bitstream/10204/5224/1/Ittmann_2011.pdf (Accessed: January 2013).

Jakubauskas, G. (2012). Lithuania Policy and Implementation: Status Quo and Basic Changes in Forming ITS Agenda [Lietuvos politika ir įgyvendinimas: status quo ir esminiai pokyčiai formuojant ITS darbotvarkę] (In Lithuanian). http://www.sumin.lt/files/uploads/G.Jakubauskas-2012-05-22-ITS-Transbaltica.pdf

Kannan, D., Khodaverdi, R., Olfat, L., Jafarian, A., & Diabat, A. (2013). Integrated fuzzy multi criteria decision making method and multi-objective programming approach for supplier selection and order allocation in a green supply chain. *Journal of Cleaner Production,* 47, 355-367. https://doi.org/10.1016/j.jclepro.2013.02.010

Kleindorfer, P.R., Singhal, K., & Van Wassenhove, L.N. (2005). Sustainable operations management. *Production and Operations Management*, 14(4), 482-492. https://doi.org/10.1111/j.1937-5956.2005.tb00235.x

Kumar, A. (2015). Green Logistics for sustainable development: an analytical review. *IOSRD International Journal of Business*, 1(1), 07-13.

Lehtonen, M. (2004). The environmental – social interface of sustainable development: capabilities, social capital, institutions. *Ecological Economics*, 49(2), 199-214. https://doi.org/10.1016/j.ecolecon.2004.03.019

Lewis, H., & Fitzpatrick, L. (2007). *Sustainable Packaging Redefined* [online]. http://nbis.org/nbisresources/packaging/sustainable_packaging_guidelines.pdf

Lee, S., & Klassen, D. (2008). Drivers and Enablers That Foster Environmental Management Capabilities in Small- and Medium- Sized Suppliers in Supply Chains. *Production and Operations Management Society,* 17(6), 573-586. http://www.econstor.eu https://doi.org/10.3401/poms.1080.0063

Markley, M.J., & Davis, L. (2007). Exploring future competitive advantage through sustainable supply chains. *International Journal of Physical Distribution & Logistics Management,* 37(9), 763-774. https://doi.org/10.1108/09600030710840859

McKinnon, A., Cullinane, S., Browne, M., & Whiteing, A. (2012). *Green Logistics: Improving the Environmental Sustainability of Logistics*. 372. ISBN 100749456787.

McKinnon, A., Browne, M., & Whiteing, A. (2010). *Green Logistics: Improving the environmental sustainability of logistics* (3nd Ed.). London: Published by Kogan Page.

Meade, L., Sarkis, J., & Presley, A. (2007). The theory and practice of reverse logistics. *International Journal of Logistics Systems and Management,* 3(1), 56-84. https://doi.org/10.1504/IJLSM.2007.012070

Monnet, M. (2008). The intermediary conditions of logistics service providers in the context of sustainable development. *Supply Chain Forum,* 9(2), 78-87.

Pagell, M., & Wu, Z. (2009). Building more complete theory of sustainable supply chain management using case studies of ten exemplars. *Journal of Supply Chain Management*, 45(2), 37-56. https://doi.org/10.1111/j.1745-493X.2009.03162.x

Piecyk, M.I., & Alan, M. (2010). Forecasting the carbon footprint of road freight transport in 2020. *International Journal of Production Economics*, 128(1), 31-42. https://doi.org/10.1016/j.ijpe.2009.08.027

Rodrigue, J., Slack, B., & Comtois, C. (2001). *Green Logistics. The Handbook of Logistics and Supply-Chain Management*. London: Pergamon/Elsevier. ISBN: 0-08-043593-9.

Sbihi, A., & Eglese, R.W. (2009). Combinatorial optimization and Green Logistics. *Annals of Operations Research,* 175(1), 159-175.

Thiell, M. (2010). *Green Logistics: Global Practices and their Implementation in Emerging Markets* [online] http://www.irma-international.org/viewtitle/53258/

Turkay, Y., & Funda, Y. (2011). Environmental reporting of industrial and supply chain business processes within the context of sustainable development. *Business: Theory and Practice,* 12(1), 5-14.

Voigt, K.-I., & Thiell, M. (2004). Industrial reverse logistics systems–a model-based analysis of alternative organizational forms using the example of the automotive industry. In Prockl, G., Bauer, A., Pflaum, A., & Müller-Steinfahrt, U. (Eds.). *Entwicklungspfade und eilensteine moderner Logistik – Skizzen einer Roadmap* (389-418). Wiesbaden.

Stolka, O. (2014). The development of green logistics for implementation sustainable development strategy in companies. *1st International Conference Green Cities 2014 – Green Logistics for Greener Cities.* www.sciencedirect.com

Wang, C., Ho, H., Luo, S., & Lin., T. (2017). An Integrated Approach to Evaluating and Selecting Green Logistics Providers for Sustainable Development. *Sustainability,* 9(218), 1-21. https://doi.org/10.3390/su9020218