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**REGENERATIVE MANAGEMENT ACCOUNTING IN THE
CONTEXT OF CIRCULAR ECONOMY**

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Abstract

Sustainability is an approach adopted by more and more companies. The importance of sustainable development is reflected in the company's financial results. The circular economy is a key to sustainable development. The circular economy requires resources to be used for as long as possible, extracting the maximum value and then recovering and regenerating the materials at the end of each lifetime. Regenerative cost accounting framework offers managers the tools and critical thinking skills necessary to succeed in business while taking into account the costs of regeneration right from the beginning of the production processes. The role of regenerative management accounting model is to help companies lower the operational and regeneration costs. How can an economic entity large or small control its costs of production and maximize its profit while tackling a green approach through a circular economy model? The aim of this paper is to identify how regenerative managerial accounting is used for a sustainable economic development in the context of a circular economy. Applying circular economy models business owners or managers can improve cash flows, create master budgets that advertise the longevity of products by using circular models that reduce the company's cost and save them money while analyzing necessary and unnecessary cash expenditures.

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Keywords: Regenerative management accounting, costs, circular economy, decision making, resources.



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1. Introduction

In the last decade the scarcity of economic resources and the inefficient business model of using resources, making products and generating wastes have brought to consumer attention the need of a more green and sustainable business and regenerative development (Owen, 2008; Mirza et al., 2011).

The aim of this paper is to identify how regenerative managerial accounting is used for a sustainable economic development in the context of a circular economy. Regenerative cost accounting framework offers managers the tools and critical thinking skills necessary to succeed in business while taking into account the costs of regeneration right from the beginning of the production processes (Mirza et al., 2011).

Controlling and calculating regenerative costs serves managers, offering information regarding the efficiency of the product they are launching and overall regarding the efficiency of the economic entity they are managing. Calculating regenerative costs has applicability in production and service industries (Cioca et al., 2014). The information system on which regenerative management in a circular economy operates is a system which generates outputs using the inputs and processes necessary to satisfy the objectives specific to circular economy.

Regenerative cost analysis bases upon a flexible system based on three management objectives:

- To offer information regarding the regeneration cost and life cycle of products, projects and services
- To supply information regarding the process of planning, developing, evaluating and acting regarding the production or service process.
- To supply information in order to sustain the decision making process.

The objectives presented above illustrate that manager, shareholders, policy makers, third parties and other users need regenerative computing accounting framework but most importantly they desire the tool for interpreting and using the information supplied by regenerative cost analysis.

2. Research Questions

How can an economic entity large or small control its costs of production and maximize its profit while tackling a green approach through a circular economy model?

Is it possible that regenerative management accounting takes into consideration the three major environmental footprints in the Deming circle process regarding the lifecycle of a product?

Will regenerative computing accounting framework support managers, shareholders, policy makers and other users in the decision making process?

Can management accounting tools for calculating direct and indirect costs help provide information about regenerative costs in the production, distribution and recycling phase of a product lifecycle?

3. Purpose of the Study

The aim of this paper is to identify how regenerative managerial accounting is used for a sustainable economic development in the context of a circular economy. Regenerative cost accounting

framework offers managers the tools and critical thinking skills necessary to succeed in business while taking into account the costs of regeneration right from the beginning of the production processes (Baleanu et al, 2014). Regarding circular economy model, regenerative cost accounting must take into consideration the three major environmental footprints (Carbon Footprint, Water Footprint and Ecological Footprint) while using the Deming quality improvement model regarding the lifecycle of a product (Bebbington et al., 2014).

The purpose of this paper is to identify if regenerative management accounting models provide solid information which are not limited to production economic entities but can be applied to all type of economic entities whatever they are in production, commerce or services.

4. Research Methods

Research methods consist of a fundamental positive and constructive research, using empirical, and statistic models. Our objective consists of a positive and constructive research to further deepening the researched field of circular economy and regenerative accounting system, relying on empirical and statistic models. The topic of regenerative management system in the context of a circular economy most definitely is on the path of the current global economic research priorities in term s of circular economy.

5. Findings

The role of regenerative management accounting model is to help companies lower the operational and regeneration costs. Applying circular economy models business owners or managers can improve cash flows, create master budgets that advertise the longevity of products by using circular models that reduce the company s cost and save them money while analyzing necessary and unnecessary cash expenditures.

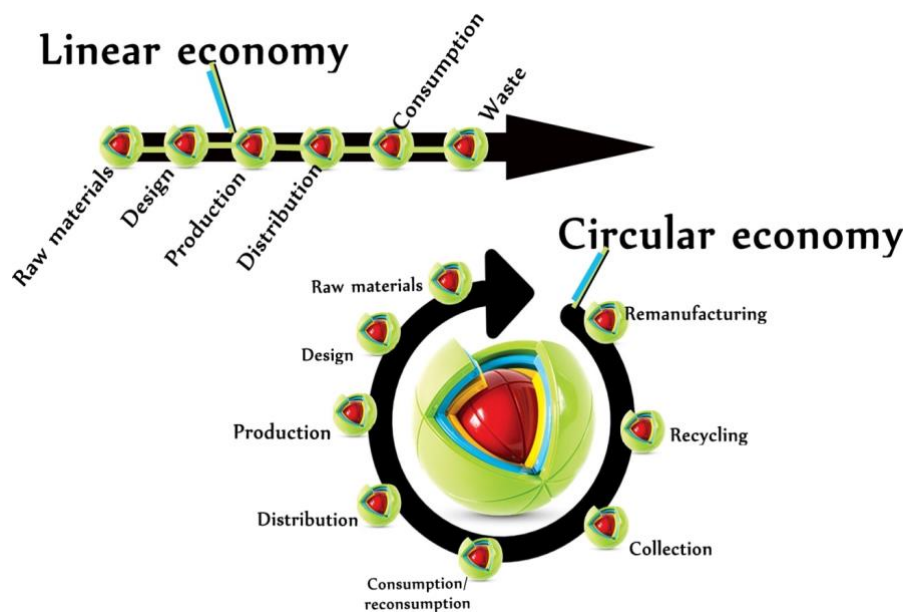


Figure 01. Difference between linear and circular economy model¹

¹ <http://www.acceleratio.eu/circular-economy/>

The entire range of regenerative cost accounting information users do not use the information given regarding financial costs and environmental regenerative costs in raw state, only those who have previously passed the accounting information system and processed, measured, analyzed and administered and synthesized in financial-accounting registers (Malsch, 2013).

As we determine the role of regeneration costs regarding a product in the process of forming the final cost of production or service regenerative cost bearers can be final or intermediary.

In order for the RMA (regenerative management accounting) to work the most important aspect is the master data management system regardless if it is generic descriptive analysis, prescriptive analysis or cognitive computing. The system can use a lot of source data, such as supply data, sourcing agents to find out who is the best supplier for shipping and distribution process in order to improve overall profitability in the company.

RMS framework can architect the model for the economic entity in order to determine how the system functions and to calculate the output of the regeneration and recycling process in order to include this output in the final price of a product (Domil, 2014). By calculating direct and indirect costs regarding the production process through regenerative management accounting managers can determine the required rate of return for the circular lifecycle of their own products or services (Hopwood, 2009; Gray, 2010).

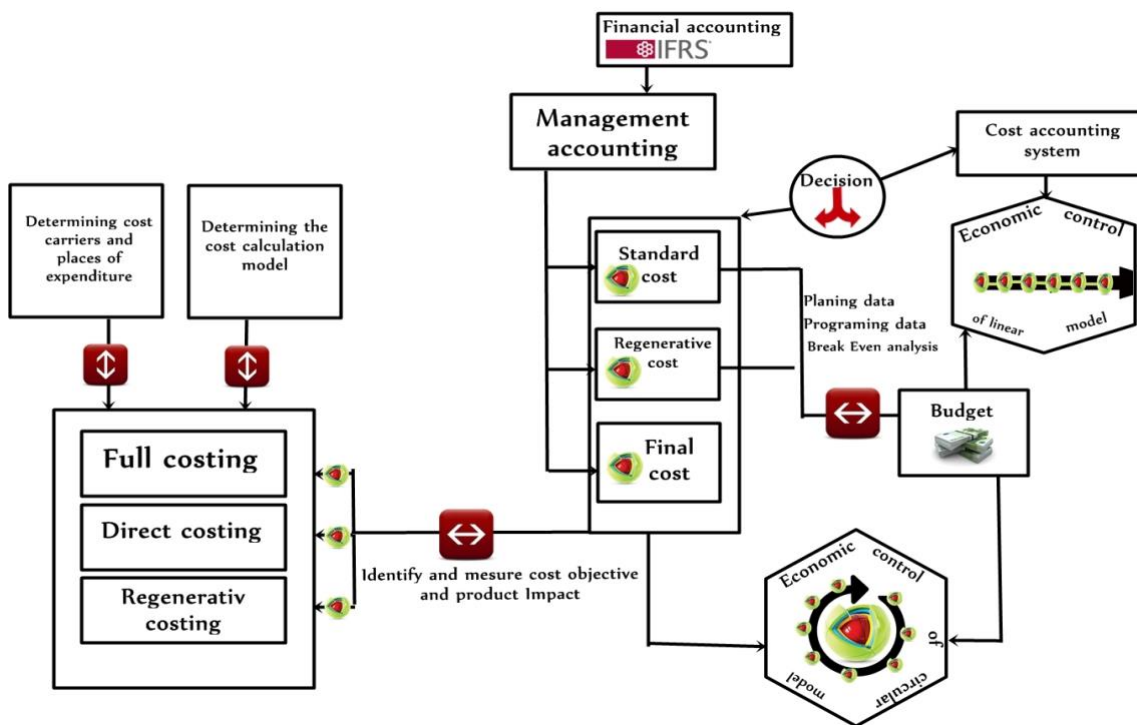


Figure 02. Regeneration cost determination process

Regenerative rate of return (RRR) can be calculated to determine and measure the growth rate of investing in a circular model within the economic entity. This RRR can be determined by the formula:

$$\text{Regenerative rate of return} = \left(\frac{\text{The investment value in the waste faze of the lifecycle}}{\text{The investment value in the production faze of the lifecycle}} \right)^{1/\text{years}} - 1$$

In order to determine the cost of regeneration of a product we can apply the indirect cost allocation process in which the cost of the regenerative activity can be determined by the formula:

$$\text{Cost of regenerating activity} = \text{Fix costs} \times \left(1 - \frac{\text{The actual volume of production}}{\text{Normal production capacity}}\right)$$

If we look at the circular economic model we can see that it is a long term process so it is very difficult to determine the productive consumption of regenerative and recycling costs expressed quantitatively. In order to achieve this goal we propose that the computational model the process of supplementing determined in classic form.

This process implies choosing a computational basis common to all products or services of the economic entity but different in size for each product or service separately. After we selected the computational basis we can calculate the supplementation factor using the formula:

$$\text{Supplementation factor} = \frac{\text{Total amount of indirect costs selected through the computational base}}{\sum \text{computational basis common to all products or services}}$$

Based upon the number and characteristics of the supplementing process we can determine globally the costs of regeneration or using differentiated coefficients or selective coefficients. Regenerative management accounting can improve the visibility and value of a company through enhancing the goodwill thus increasing the overall intangible assets. Intangible assets represent assets without physical substance what means we cannot see or touch the asset therefore many managers don't take into account these types of assets especially goodwill (Mates et al., 2012). Because they do not recognize the intangible assets within their own economic entities they are not aware of the future economic benefits these types of assets generate for the company (Thomson, 2014).

If we turn our attention to Renault car manufacturer how estimates that implementing circular economy to just EU countries alone could value around 630 billion dollars.

6. Conclusion

Regenerative management accounting can improve the decision making process through reviewing each circular opportunity through quantitative and qualitative analysis that in the end will transform in increasing financial returns.

By calculating direct and indirect costs regarding the production process through regenerative management accounting managers can determine the required rate of return for the circular lifecycle of their own products or services. Regenerative management accounting can improve the visibility and value of a company through enhancing the goodwill thus increasing the overall intangible assets.

By 2025 World Bank estimate that humans will generate 2 trillion kilograms of waste in urban areas alone most of which come from linear economy which does not recuperate a large amount of wastes that are being generated. Regenerative management accounting has a determining role in economic entities in the new circular economy because it's based on the creation of value. Through circular economy economic entities can create value for all parties starting from stakeholders who can obtain higher return on their investments, the employees who will have stable working environment in which they can grow and

develop a career, to large public and customers who will have as a partner a firm which is socially responsible and bases its strategy on a long term through regenerating resources and creating a circular model of business in a world with so many limited resources. Regenerative management accounting can give higher value to customers at a lower expense of the supplier or employer due to the income generated from the regeneration and recycling process of all wastes created which are reusable up to 75%.

A real challenge is to implement this circular model in companies worldwide keeping in mind that the global waste market is estimated at around 400 billion dollars. On the other hand circular economy will provide a market where products will be disassembled and materials reused in the production process which will decrease the price of raw materials in some extent.

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