BARRIERS TO CIRCULAR ECONOMY IN EUROPEAN SMES

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Overview

The concept of circular economy (CE) is gaining impetus as a way of moving towards sustainable, low carbon, resource efficient and competitive economies. The transition from a linear to a circular model of production and consumption will only be possible through innovation and technological development (Jesus et al. 2018). In December 2015, the European Commission launched a set of measures to guide European firms and consumers towards the implementation of CE (European Commission 2015). The increasing importance of CE will impact on the use of energy by firms as well as on energy transition. In this paper, we focus our analysis on two of the main energy activities related with CE: the use of renewable energy in firms and energy efficiency or how to re-plan energy usage to minimise consumption. In addition, we also consider other CE activities related with water reduction, waste management and redesigning new products and services to minimise the use of materials.

Although the benefits of adopting CE activities such as cost savings, reduction of CO_2 emissions, economic growth and job creation are increasingly recognised (Ellen MacArthur Foundation 2012) there are still many barriers to the transition to CE. Adopting CE practices involves to overcoming different barriers and challenges according to firms' strategies, resources and capabilities. A firm that was established in the linear economy requires time to modify the way that it produces, does business and to progress towards CE. In this paper, our main research question is what stops firms from getting involved in CE activities and particularly in the introduction of renewable energy and the adoption of measures to increase energy efficiency. In this analysis, we examine two types of perceived barriers in implementing CE activities: revealed and deterring barriers. Therefore we distinguish firms that are aware of the problems in doing CE from firms that do not engage in CE activities because some barriers deter them. In our analysis we examine human resources, expertise, regulation and financial barriers.

Methods

To examine which barriers affect the implementation of CE activities we have carried out an empirical analysis with a large dataset. While the most common research methods are case studies or econometric analysis mainly based on small samples, we work with a dataset built from the Flash Eurobarometer Survey 441 on "European SMEs and the Circular Economy". In this survey, information is drawn from responses from 10,618 managers of SMEs, conducted in 2016. The Flash Eurobarometer Survey 441 includes the 28 member states of the European Union and refers to micro (1–9 employees), small (10–49 employees) and medium (50–249 employees) companies in industry and service sectors.

One of the main advantages of the Flash Eurobarometer Survey 441 is that it is an extensive survey that includes three dimensions: country, sector, and firm. Most environmental empirical databases offer only aggregate information at the country level, so having three dimensions in the same database allows researchers many possible views and perspectives on the data. However, it is a cross-sectional dataset, and so the problem of simultaneity is somewhat unavoidable. We carry out our empirical estimation applying a multinomial probit model instead of univariate probit models. Multivariate probit models allow the error terms to be correlated across equations and with this account for the potential relationship of perceiving more than one barrier jointly. We use the following specification:

$Barriers_i = \alpha_i + \beta_i\, CE_i + \delta_i\, Controls_i + \varepsilon_i$

Where *Barriers* are a lack of human resources, a lack of expertise to implement CE activities, complex administrative or legal procedures and the cost of meeting regulation or standards, and difficulties in accessing finance. CE are circular activities (use of renewable energy, re-plan energy usage to minimize consumption, re-plan of the way water is used to minimize usage and maximize re-usage, minimize waste by recycling or reusing waste or selling it to another company and redesign products and services to minimize the use of materials or use recycled materials). As controls we use size, age, turnover, R&D effort and sector and countries.

Results

The results of the descriptive analysis show that most SMEs (77% of the sample) are undertaking some CE activity to become more resource efficient. However, on average, SMEs are implementing just 1.7 CE activities of the five activities considered. The most common energy CE activity taken up by the firms in the EU28 is improving energy efficiency (43% of the firms). On the other hand, only 18% of firms are using renewable energy. Other CE activities are minimising waste by recycling, reusing waste, or selling it to another company (59% of the firms), the re-designing of products (36%) and re-planning water usage (20%). Regarding the number of CE activities, 24% of the SMEs adopted only one activity while 22% implemented two activities. When observing the intensity in euros, SMEs are concentrated mainly in the low interval (between 1 and 5% of turnover). Looking at the barriers, 38% of firms consider regulation to be the barrier that hampers them most in carrying out CE. In contrast, for the rest of the barriers (lack of human resources, expertise and difficulties in accessing finance) this percentage is below 25%.

Our empirical estimations using a multinomial logit model provide the following results. First, the correlations of the error terms are always positive and significant which suggests that there is a positive relationship in the perception of the different barriers. Second, they show that it is necessary to distinguish in this kind of analysis between revealed and deterring obstacles. A significant number of firms that are adopting CE activities perceive barriers and the estimations show that regulation is the most important revealed barrier. A lack of human resources and difficulties in accessing finance are also significant revealed barriers. Third, financial obstacles are perceived particularly by small and young firms. Fourth, the results of the estimations, taking into account the number of CE activities adopted, reinforce the conclusion that regulation is the most important revealed barrier. On the other hand, a lack of expertise and difficulties in access to finance deter firms from beginning CE activities. Finally, improving energy efficiency is deterred by a lack of expertise while the existence of complex administrative procedures and the cost of regulation appears again as a revealed barrier for firms that are implementing CE activities.

Conclusions

The concept of circular economy is gaining importance from a managerial as well as a policy point of view and this will have effects on the use of energy by firms. In this paper, we have examined the barriers that may hamper or even deter the adoption of CE activities using the information from the Flash Eurobarometer Survey 441 on "European SMEs and the Circular Economy". We have considered two energy activities that are very important from a CE perspective: the use of renewable energy in firms and improving energy efficiency. We have also included in our analysis other CE activities related with the use of water, minimising waste and redesigning products and services.

The results from our analysis highlight the fact that a significant number of firms are implementing CE activities but are facing barriers to this process. Our results also show that it is important to distinguish between revealed and deterring barriers and that some barriers such as the existence of complex administrative procedures and the cost of regulation are particularly important. Some managerial and policy implications from these results are that it seems important that managers devote more resources to meeting the requirements of the regulations on implementing CE activities. In addition, in order to change economic production to a more sustainable system, policy support and incentives are required to convince SMEs to carry out CE activities as a main purpose.

References

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