“Carbon tax policy implications for economic growth and unemployment rates in South Africa: a conceptual thought”

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Carbon tax policy implications for economic growth and unemployment rates in South Africa: a conceptual thought

Abstract

This study provides a conceptual thought on whether the proposed carbon tax in South Africa is appropriate at this time of economic recession and the likely implication for economic growth and unemployment. This study identifies and discusses three critical issues that are likely to impact on economic growth and unemployment when implementing a carbon tax policy. First, a carbon tax may worsen the apparent slow growth of the South African economy and unemployment. Second, a carbon tax is not likely to reduce global warming judging from the experience of other countries that have implemented a carbon tax. Third, proposed revenue neutrality and granting of carbon tax holidays to selected companies may become unrealistic. This study preferred a mix of qualitative and quantitative exploratory research method which involves relevant review of literature where themes relevant to current debate on the proposed carbon tax in South Africa are reviewed. The study recommends that policy makers should be fully aware of such issues in carbon tax policy that could threaten a host of businesses's bottom line.

Keywords: carbon tax, unemployment, economic growth, emissions reduction, South Africa.
JEL Classification: H23, M40, Q48.

Introduction

A lot of literature exists on the effect of carbon tax on unemployment and economic growth within various economies (Koskela & Schöb, 1999; Bye, 2002). The use of the CGE model is popular, whereas others have extended earlier works by developing a model of the labor market that incorporates relevant features for analysis of this issue within the context of developing countries (Carraro et al., 1996). Notwithstanding, this study provides a conceptual thought on whether the proposed carbon tax in South Africa is appropriate at this time and what are the likely implications for economic growth and unemployment. This study identifies and discusses three critical issues that are likely to impact economic growth and unemployment when implementing a carbon tax policy. First, a carbon tax may worsen the apparent slow growth of the South African economy. Second, a carbon tax is not likely to reduce global warming, judging from the experience of other countries who have implemented a carbon tax. Third, proposed revenue neutrality and granting of carbon tax holidays to selected companies may become unrealistic.

Interestingly, the South African government has decided that a carbon tax policy will be implemented from 1 January 2016 to raise revenue and reduce global warming impact from carbon emissions (The Carbon Report, 2014). Since an overwhelming majority of South Africa's energy needs are met by carbon-emitting fossil fuels, a carbon tax on these fuels will directly raise the cost of electricity, petrol, diesel fuel, and home cooking paraffin. Since low-income families spend a larger proportion of their income on energy; a tax that increases energy prices would disproportionately affect the budgets of the poorest South African families (CGCSA, 2014; AFDB, 2012). By the same token, businesses may be prevented from further investing and expanding in South Africa as they grapple under the burden of higher energy costs that would affect their profit margins and would likely pass such additional cost to consumers.

With various perspectives offered on how carbon tax could affect the economy, it can be argued that the effect of a carbon tax policy is largely determined by policy design and how carbon tax proceeds are used to cushion the ripple effect it brings along. In any case, a carbon tax is expected to increase the cost of fossil fuel and subsequently influence organizations to switch to cleaner fuel, which is currently expensive, thereby forcing businesses and households to reduce energy use (Kaygusuz, 2012). In order to give credence and support to carbon tax policy, the South African government proposed revenue neutrality and the granting of carbon tax holidays to selected companies. As such, one needs to ask about the dangers of a higher energy price on international competitiveness of South African companies? For companies that are carbon-intensive, a carbon tax will raise their average production costs, whereas others are better positioned to recover cost increases. However, if a company's commodity prices are determined at the international market, such as metals and chemicals, the company's operations could become disproportionately affected in relation to its international competitors. The main question in this study is, namely: will the proposed carbon tax be good for South Africa's economic growth and unemployment rates?

The rest of the study is organized as follows: Section 1 discusses the proposed carbon tax policy in

South Africa; Section 2 comprises carbon tax, emissions reduction, economic growth and unemployment, Section 3 includes the methods; Section 4 reveals discussion; and the final Section gives conclusion.

1. The proposed carbon tax in South Africa

In order to fulfil the pledge made by the South African government to the Conference of the Partiesat the United Nations Framework Convention on Climate Change (UNFCCC COP) 15 negotiations in 2009 to reduce its GHG emissions by 34% in 2020 and 42% in 2025, a carbon tax is considered an appropriate mitigation instrument to ensure the country achieves its GHG emissions target (National Treasury, 2013). The proposed carbon tax policy is anchored on the following:

- tax applied directly to measured GHG emissions (this is considered administratively complex);
- fossil fuel input tax on coal, crude oil, and natural gas which is based on their carbon content; and
- tax levied on energy outputs such as electricity and transport fuels (National Treasury, 2013).

In South Africa, a carbon tax policy is preferred over emission trading system (ETS) because of its oligopolistic energy market nature. Policy makers believe that a carbon tax will influence a positive change among emitters to have a positive effect on climate change. The proposed carbon tax aims to correct the existing prices of goods and services that generate excessive levels of anthropogenic GHG emissions, so that it reflects the social costs of such emissions (National Treasury, 2013). On the other hand, the South African National Treasury has proposed a carbon tax of US$12 per ton of CO_2 emitted with an annual increase rate of 10 per cent (National Treasury, 2013). It is expected that a carbon tax will generate additional revenue for the government between US$1.5 billion and US$2 billion annually (National Treasury, 2013). According to the National Treasury, the main objective for introducing a carbon tax is to change future behavior rather than to raise revenue. But there are concerns that the proposed carbon tax could cripple industries' expansion since they constantly compete against international competitors. Besides, a carbon tax policy could be ineffective in changing business use of fossil fuel-related energy sources. It is pertinent to understand how a carbon tax policy would affect economic growth and unemployment.

Indeed a uniform tax has been proposed in South Africa on per unit of carbon emission regardless of the source of its generation (The Carbon Report, 2013). This is in accordance with the traditional Pigouvian tax approach of imposing penalty to deal with externality-generating activity (Carlton & Loury, 1980). A carbon tax is a tax on carbon dioxide (CO_2) emissions through the combustion of fossil fuels from electricity production in industrial, commercial and residential heating and lighting, to fuel and gas through transportation, cooking and residential heating. In South Africa, a carbon tax is a tax per ton of CO_2, since CO_2 is the substance of interest and not the carbon itself. In most countries where carbon tax has been introduced, the tax rate usually starts at a low rate and rises over time. While there are different options for applying carbon tax, each option has different impact on overall cost, effectiveness of raising revenue, and capability of reducing CO_2. This depends on how and where the tax is implemented and how the tax revenue is used.

2. Carbon tax, emissions reduction, economic growth and unemployment

According to Zhixin and Ya (2011), the negative impact of carbon tax on coordinated economy development should be considered when implementing a carbon tax policy. This is necessary because we are in the era of highly developed international trade whereby each country seeks to increase its economic growth rate. While studies indicate that a carbon tax on energy consumption can effectively reduce carbon dioxide emissions and promote low-carbon economy and slow down climate warming (Floros & Vlachou, 2005), carbon tax is confirmed to have a negative impact on industries, resulting in large losses to the economy (Gao & Chen, 2002; Zhixin & Ya, 2011). However, it does not mean that a carbon tax will not have a positive impact on the economy, especially in shaping the attitude of industries to embrace low-carbon manufacturing (Zhu et al., 2010).

The use of carbon tax as an instrument to reduce global emissions and climate change has been the subject of scholarly discuss for a long time (Pearce, 1991; Weyant, 1993; Metcalf, 2009). While excessive carbon emissions have been identified as an important cause of global warming (Meinshausen et al., 2009), the use of carbon tax as an economic instrument to reduce carbon emissions by industries has been widely accepted by countries around the world as appropriate. But 'global warming and climate change' are longterm issues that require substantial mitigation effort involving complex interactions among environmental, economic, social, technological and political processes (Sathre & Gustavsson, 2007). Although there are numerous potential options for reducing carbon emissions, national policies to encourage climate change mitigation can comprise a portfolio of market-based instruments, regulatory instruments and voluntary

instruments (Sathre & Gustavsson, 2007). Among a variety of instruments to control carbon emissions, a growing number of governments worldwide has opted for carbon tax as the most effective economic measures because of its relatively straight forward implementation and low transaction cost; its dynamic efficiency giving a permanent incentive to reduce emissions; and the ability to recycle tax revenues back into the economy (Sathre & Gustavsson, 2007; Fang et al., 2013).

Although the South African government has proposed a graded exemption package to be implemented for all sectors from the commencement of the carbon tax regime, the level at which the tax is pitched is much higher than it was in other countries. Despite the high introductory rate, there is also the planned increase of 10 per cent annually from 2016 to 2019. Some of the implications highlighted by companies in response to the proposed carbon tax to parliament are, namely, the obvious negative effect on the economy and job creation because of the increased cost to carbon-intensive companies (Devarajan et al., 2009). Moreover, the experiences of countries that have implemented a carbon tax regime do not favor its use to reduce carbon emissions, nor less its effect on industrial and economic growth as well as its impact on the poor, especially in South Africa where over 30% of the population depends on social grants for their daily requirements (Fakoya, 2013). While some studies have demonstrated the adverse effect the proposed carbon tax will have on employment and investment (Devarajan et al., 2009), there are no guarantees that the effects of the carbon tax will be fully offset by the use of the carbon tax revenues to reduce other taxes, such as taxes on personal and corporate income.

3. Methods

A qualitative exploratory research method is preferred which involves relevant review of literature where themes relevant to current debate on the proposed carbon tax in South Africa are reviewed. Furthermore, the study utilised the sample Pearson's correlation coefficient to determine the correlation coefficient between unemployment rate and economic growth rate in South Africa (2009-2013) to give a robust analysis of the implication of implementing a carbon tax. Data for analysis were obtained from the World Bank data on economy and growth rates, as well as Statistics South Africa for data on unemployment rates. The exploration of a new phenomenon, such as the proposed carbon tax, in this way is to help provide a better understanding of the implications of the new policy on identified economic indices. The objective of an exploratory study is to identify key issues and key variables. This study provides a conceptual thought using a review of relevant literature approach to draw conclusions on whether the proposed carbon tax in South Africa is appropriate at this time and highlights likely implication for economic growth and unemployment. The study identified and discusses critical issues that should not be ignored prior to implementing a carbon tax. A key consideration is the implication of the proposed carbon tax on energy-related goods and its effect on economic growth and unemployment in South African context.

4. Findings and discussion

The study provides a conceptual thought on the appropriateness of the proposed carbon tax in South Africa at a time of slow economic growth and high unemployment rates. This study uses data from the World Bank data on economy and growth rates and Statistics South Africa for data on unemployment rates for the period of 2009 to 2013 as a basis for analysis. The study also identifies and discusses three critical issues that are likely to impact on economic growth and unemployment when implementing a carbon tax policy. First, that a carbon tax may worsen the apparent slow growth of the South African economy. Although, a move towards a low-carbon economy facilitated by a carbon tax has the potential to create a number of 'green jobs', recent experience from Australia, where analysis by researchers concluded that carbon pricing worked only in the short-term, suggests otherwise (Chemistry World, 2014). On the other hand, Winkler (2007) mentions that energy efficiency measures generate significant employment opportunities, with savings on energy expenditures enabling greater expenditure on non-energy goods, and services which generally are more labor-intensive in production may get more people employed directly in energy efficiency initiatives, thus leading to employment gains throughout the economy (Winkler & Marquard, 2011; UNEP Collaborating Centre for Climate & Sustainable Energy Finance, 2013). One likely effect of a carbon tax is a reduction in the national employment rate because workers will be forced to demand for higher wage as a result of increase in consumer prices and lower purchasing power in an economy like South Africa with high dependency on government grants of 29 per cent (Fakoya, 2013). Moreover, there will be low demand for workers in carbon-intensive companies to reduce current wage bill so as to meet the burden of a new carbon tax payment. The implication is that, over time, workers' incomes would decline. Consequently, workers demand for higher wages to meet the rising increase in consumer goods is likely to result in lay-offs to meet up with increasing wage

demand. Although, the effect of a carbon tax on employment depends on factors such as the carbon-intensity of the producers; the degree to which they can pass the increased costs to consumers; the strength of import competitors; the producers' ability to substitute with less carbon-intensive energy sources; and the consumers' ability to switch to low carbon-intensive products.

At any rate, the proposed revenue neutrality and granting of carbon tax holidays to selected companies is likely to become unrealistic as other companies exempted from such benefits may feel isolated and discriminated against. Furthermore, the negative impact of a carbon tax on total manufacturing output in South Africa is likely to be significant, with output from energy-intensive manufacturing sectors dropping. Investors might even move their funds away from energy-intensive companies toward less regulated business enterprises, thus depriving energy-intensive companies' much-needed fund for a more efficient power generation. The result is higher energy costs, lower income and fewer jobs.

Table 1. South Africa's unemployment and economic growth rates

Year	Unemployment rate – *X*	Economic growth rate – *Y*
2009	23.7	-2
2010	24.7	3
2011	24.7	3
2012	25.0	3
2013	25.2	2.56

Source: The World Bank: http://data.worldbank.org/topic/economy-and-growth. Statistics South Africa: http://beta2.statssa.gov.za/?page_id=737&id=1.

The sample Pearson's correlation coefficient represented by the formula below is used to analyze the data in Table 1 above.

$$r = \frac{\sum_{i=1}^{n}(X_i - \bar{X})(Y_i - \bar{Y})}{\sqrt{\sum_{i=1}^{n}(X_i - \bar{X})^2}\sqrt{\sum_{i=1}^{n}(Y_i - \bar{Y})^2}}$$

Results from the above data analysis indicate that there is a strong correlation of about 0.9 between unemployment rate and economic growth rate in South Africa. This is an indication that unemployment is positively influenced by economic growth. Although, a carbon tax could lead to slow growth in companies with high carbon-intensive, it could be an advantage to companies that use alternative cleaner energy as they would be able to save for the tax incentive. But the slow pace of investment in renewable energy among companies in South Africa may erode potential advantage of carbon tax savings. Essentially, it is expedient to understand the likely effect of a possible low industrial growth on the country's unemployment especially where the majority of the unemployed are youth. Conversely, a carbon tax might result in overall economic growth if tax proceeds are used to promote economic growth variables such as cutting other taxes or to reduce national deficits (Zhixin & Ya, 2011). Reducing personal and corporate income taxes for example, is associated with economic growth through increased disposable income, and largely because these taxes distort employment, savings and investment. Indirectly, carbon tax will affect everybody within the economy since electricity prices and fuel-related products will increase. In terms of electricity, prices could increase by an average of 8% or 4.80 cents per kW (The Carbon Report, 2014). Carbon tax revenue could be used to promote growth through promoting productive government spending, funding basic research, funding essential infrastructure, and investments in human capital (Zhu et al., 2010). However, the failure to rechannel realised carbon tax revenue efficiently would render the objective of the policy and its output inconsistent and damaging to the overall economy.

On the other hand, a carbon tax is not likely to reduce global warming judging from the experiences of other countries that have implemented a carbon tax. The ongoing debate about how to address the fallout that may result from imposing a carbon tax to improve the South African economy and at the same time reduce carbon emissions has been considered in the literature review in this study and is unlikely to be any different in the case of South Africa. This assertion is based on the experiences of countries that have implemented the carbon tax model which indicates that the net effects on most of these economies are negative (Fakoya, 2013). Specifically, findings indicate that revenue raised by a carbon tax has significant negative impacts that outweighed its contribution to the overall economy. Most significantly, a carbon tax would have a net negative effect on jobs, consumption, and investment resulting in lower national revenues from taxes on capital and labor as experienced by Australia. As a consequence, by factoring in lost revenue from reduced economic activity from lost jobs; reduced consumption as a result of lost jobs; low investment resulting from the additional carbon tax; and the relocation of businesses to other carbon tax relaxed countries, the net revenue from a carbon tax available to finance national deficit and debt, and lower tax rates will be relatively small. In addition, the increased costs of coal, natural gas and petroleum products due to a carbon tax will cause ripple effect in the already slow economy resulting in higher production costs and less spending on energy-intensive

goods. Consequently, a carbon tax is likely to result in lower real wage rates because companies would have higher costs and lower labor productivity.

Conclusion

While a carbon tax is intended to encourage companies to invest in low carbon energy sources, the cost of alternative energy sources are often too expensive to be undertaking by individual companies. In addition, the increasing cost of fossil fuel is unlikely to force organizations to switch to cleaner fuel. Moreover, forcing businesses and households to reduce energy use, may be unrealistic as they will be forced to seek other means to avoid a carbon tax burden. However, if the switch to more efficient and cleaner energy sources by businesses is successful, this will make the economy become less dependent on fossil fuels and, as such, prevent the economy from energy price shock effects. But the experiences of countries that have implemented a carbon tax policy suggest that the net effects on most of these economies are negative. The study anticipates that a carbon tax is likely to worsen the unemployment and economic growth rates in South Africa should the proposed carbon tax be implemented. Also, the study believes that despite the likelihood of a carbon tax to encourage investment in renewable energy sources, the capital outlay of investing in renewable energy is a major setback and unlikely to produce any significant reduction in global carbon emission. As such, the granting of carbon tax holidays to selected companies will bring about short-cuts in the operations and declarations of those excluded from such incentives. Alternatively, the study recommends that government should adopt other policy options like carbon trade-off that allow companies in South Africa to offset the impact of carbon tax without threatening their local and international competitiveness. Another approach could be to lower the capital tax rates and increasing depreciation allowances of carbon-intensive industries to reduce overall production costs, or a general reduction of the carbon tax on such companies with a condition to investment savings in renewable energy projects after agreeing to a holiday period. In effect, for a successful implementation of a carbon tax to be achieved by the South African government, it has to be fully aware of such issues in carbon tax policy that could threaten a host of businesses's bottom line. The study further recommends the continued increase in the development of alternative technologies at national level through aggressive financing of renewable energy technologies to facilitate a switch to cleaner energy. The study suggests further study into the actual effect of a carbon tax on unemployment and economic growth when the policy commences.

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