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Analysis

Public preferences for carbon tax attributes

Z.Eylem Gevrek [a,*], Ayse Uyduranoglu [b]

[a] University of Konstanz, Germany
[b] Istanbul Bilgi University, Turkey

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ABSTRACT

The impacts of climate change are already visible throughout the world. Recognizing the threats posed by climate change, the Durban Platform, the 17th Session of the Conference of Parties (COP 17), underscores that the global nature of climate change calls for the widest possible cooperation and ambitious action by all countries. A crucial starting point for the design of effective and publicly acceptable policies is to explore public preferences for climate policy instruments. Using a choice experiment, this study investigates public preferences for carbon tax attributes in a developing country context. The results account for heterogeneity in preferences and show that Turkish people prefer a carbon tax with a progressive cost distribution rather than one with a regressive cost distribution. The private cost has a negative effect on the probability of choosing the tax. Earmarking carbon tax revenues increases the public acceptability of the tax. Moreover, there is a preference for a carbon tax that promotes public awareness of climate change.

1. Introduction

Anthropogenic climate change is one of the major issues facing the planet. There have been many international efforts to draw attention to the importance of the problem. The United Nations Framework Convention on Climate Change (UNFCCC) at the Rio de Janeiro Conference in 1992 was the first step taken at an international level to tackle the threat of climate change. The important point UNFCCC emphasizes is that all countries have common but differentiated responsibilities in mitigating climate change (Breidenich et al., 1998). The other remarkable initiative taken at the global level was the Kyoto Protocol in 1997, which set a target only for developed countries. However, the 17th Conference of Parties (COP) organized in Durban in 2011 pointed out that not only developed countries but also developing countries will have some responsibilities, starting from 2020, to achieve global participation in mitigation efforts.[1]

Turkey became a party to the UNFCCC in 2004 and ratified the Kyoto Protocol in 2009.[2] However, it did not have any mitigation commitments between 2008 and 2012. During this period, the only obligation of Turkey was to monitor greenhouse gas (GHG) emissions from all sources. In 2011, the Ministry of the Environment and Urbanization released Turkey's first National Action Plan on Climate Change, which outlines the main problems associated with climate change and underscores the priorities to mitigate them, but the Action Plan does not set a target to reduce GHG emissions. In practice, Turkey has little experience of implementing market-based climate policy instruments. To date, it has engaged in the voluntary carbon market, which is not regulated under any official legislation.[3] In terms of using taxation as a pricing strategy to reduce GHG emissions from transportation, the Turkish

* Corresponding author at: Department of Economics, Box D124, University of Konstanz, 78457 Konstanz, Germany.
E-mail address: zahide.gevrek@uni-konstanz.de (Z.E. Gevrek).

[1] Taking into consideration all greenhouse gas (GHG) emissions in countries during the 1850–2010 period, den Elzen et al. (2013) provide evidence that the contribution of developing countries to global cumulative emissions will surpass that of developed countries within a decade.

[2] Turkey, as an OECD country, was included in Annex I and Annex II of the UNFCCC, together with the developed countries, in 1992. After lengthy debates at various UNFCCC meetings, Turkey's special case was recognized and its name was removed from Annex II with decision 26/CP.7 of the Seventh Conference of Parties (COP) in Marrakesh in 2001. Turkey acceded to the UNFCCC as the 189th party on 24 May 2004.

[3] Liese et al. (2012) provide a good overview of the state of the Turkish voluntary carbon market. As of June 2012, Turkey had hosted 146 listed and registered projects in the field of wind, geothermal, hydropower, and municipal waste, of which 103 were under the Gold Standard and the rest were under the Verified Carbon Standard.

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Finance Ministry has recently announced a plan for restructuring vehicle taxes. Under the new scheme, the taxes will be based on the amount of pollution generated by a vehicle rather than its engine size and age. As a rapidly growing country with a high demand for energy products, Turkey has to design an effective climate change policy in the near future to comply with its commitments under the UNFCCC.[4] Given the fact that climate change mitigation is one of the priorities of the European Union (EU) environmental policy, the implementation of a more ambitious and coordinated climate change policy would also serve to demonstrate Turkey's readiness to fulfill its EU membership obligations. Using a choice experiment approach, this study explores public preferences for carbon tax (CT) attributes in Turkey. We believe that investigating public preferences is a useful starting point to the design of effective and publicly acceptable mitigation policies. Moreover, the policy implications of our findings may be particularly relevant to the implementation of market-based climate policy instruments in developing countries.

The acceptability and efficiency of climate policy instruments have been extensively discussed in the literature.[5] Researchers mostly employ a contingent valuation method to calculate the public's willingness to pay (WTP) for reductions in GHG emissions.[6] The number of studies using the choice experiment (CE) method to investigate public preferences for climate policy instruments is limited. Using an internet-based CE, Brannlund and Persson (2012) investigate peoples' preferences for climate policy instruments in Sweden. They show that Swedes do not like the use of tax as a policy instrument and prefer instruments with a positive effect on environmentally friendly technology and climate awareness. In addition, instruments with a progressive cost distribution are preferred to those with a regressive cost distribution. Saelen and Kallbekken (2011) conduct a CE to examine to what extent earmarking revenues from a fuel tax increases the public acceptability of this instrument in Norway. They provide evidence that earmarking increases acceptability because people do not believe that the tax is environmentally effective without earmarking. Bristow et al. (2010) use a CE to explore the impact of design attributes on the public acceptability of personal carbon trading and carbon tax in the United Kingdom. They find that design has a significant impact on the public acceptability of both measures. Our study contributes to the literature on this scant number of CE studies by analyzing public preferences for CT attributes in a developing country context.

In our CE, we propose CTs as a climate policy instrument for the following reasons.[7] First, by setting a clear price on emissions, CTs encourage polluters to adopt greener practices and promote renewable energy policies. For instance, a higher price on carbon emissions may lead to increased investment in cleaner energy sources such as solar and wind power. Second, in addition to being transparent and simple, a CT can be applied across all major emissions sources of the economy. Third, CTs are easier for governments to implement compared to other market-based instruments as policy makers can rely on the well-established administrative structure of existing taxes. For example, a cap-and-trade system requires a totally new administrative structure that facilitates the establishment of an efficient emissions trading market. In spite of these advantages, the adoption of a CT has been limited due to concerns about its impact on income distribution and international competitiveness.[8] A CT may curtail international competitiveness by adversely affecting the energy-intensive firms and industries that compete in an international market. However, Porter (1991) and Porter and ven der Linde (1995) point out that environmental regulations often cause firms to be more efficient and competitive in the long run by triggering technological innovation and production efficiency. Even if there is a close link between the adoption of a CT and the loss of international competitiveness, the potential negative consequences might be significantly mitigated through a properly designed set of measures such as the use of the tax revenue to lower corporate income taxes. Another way of mitigating the competitiveness problem is to implement border tax adjustments (BTAs) on imports from countries with no carbon restrictions. BTAs essentially aim to remove any comparative advantage that foreign producers have because of less stringent environmental policies by imposing the same cost on imports as if their production had taken place in the domestic country (Dissou and Eyland, 2011). Although most studies indicate that the distributional impact of a CT is likely to be regressive, disproportionate burdens on poor households can be offset by recycling some portion of the tax revenue back to them through direct rebates or targeted tax swaps (Morris and Munnings, 2013; Metcalf, 2009). Moreover, the revenue raised from a CT can be used to alleviate concerns over the environmental effectiveness of the tax through earmarking revenues for environmental purposes, thereby increasing the public acceptability (Dresner et al., 2006). It is worth noting that carbon taxation is gaining ground in developing countries. South Korea and Chile are planning to introduce a CT. Mexico and Costa Rica have already introduced it. Most recently, South Africa's carbon tax is scheduled to go into effect in January 2016 (World Bank, 2014).

The CE data come from 1252 individuals randomly selected from 16 cities of Turkey. To explore heterogeneity in public preferences for CT

[4] Turkey's rapid development between 1990 and 2011 resulted in a 119% increase in GHG emissions (UNFCCC, 2013).

[5] Stavins (1997) discusses frameworks and instruments that individual nations and groups of nations can adopt to achieve their climate goals. He also points to domestic and international institutional impediments to their implementation in practice. Baranzini et al. (2000) evaluate CTs with respect to their competitiveness, distributional, and environmental impacts. Sumner et al. (2009) review CT policies around the world and evaluate the effectiveness of existing CTs. Lorenzoni et al. (2007) explore the barriers that citizens and communities face in mitigating climate change. They also discuss possible policy measures that increase public participation in mitigation efforts in the United Kingdom.

[6] Carlsson et al. (2012) provide a good review of studies that employ a contingent valuation method to calculate the public's WTP to reduce GHG emissions. Using a contingent valuation method, Adaman et al. (2011) measure Turkish urban households' WTP for CO_2 emission reductions and investigate the determinants of their WTP. They provide evidence that the majority of people in Turkey are very willing to contribute to climate change mitigation projects. Consistent with the existing literature, they find that not only individuals' socio-economic characteristics but also their attitudes and awareness towards environmental issues have a significant effect on the self-reported WTP figures. Moreover, Ertör-Akyaz et al. (2012) conduct a survey to explore Turkish citizens' preferences for renewable and nuclear energy. They show that the majority of respondents endorse renewable energy sources such as wind and solar even if investments in these energy sources result in a 25% increase in their electricity bills, indicating Turkish citizens' willingness to contribute to climate change mitigation policies.

[7] Climate change leads to a negative externality that has to be internalized through government policies. The International Panel on Climate Change (IPCC) suggests the following climate policy instruments to tackle this issue: CTs, tradable permits, subsidies, voluntary agreements, and information instruments. Economists strongly favor market-based instruments such as CTs and emission trading as they are cost efficient. The application and effectiveness of market-based instruments has been the subject of much research (EEA, 1996; EEA, 2000; Herber and Raga, 1995; OECD, 1997; OECD, 2001; OECD, 2006). From the economic point of view, the objective of CTs is to ensure that all the external costs associated with climate change are fully taken into account (Pigou, 1920). In practice, this raises some difficulties concerning the estimation of the accurate external cost of climate change (McKay et al., 1990; Smith, 1992). Therefore, the primary purpose of CTs is to provide incentives for polluters to emit less carbon rather than fully internalize the external cost associated with climate change. In addition, Weitzman (1974) shows that in theory, CTs and emission trading are equivalent in terms of efficiency and effectiveness. However, in the case of uncertainties about the cost and damage functions, a CT fixes the price of carbon but does not give certainty about emissions reduction whereas emission trading allows uncertainty on the price of carbon but provides certainty about emissions reduction (Montero, 2002).

[8] To date, 13 countries (i.e., Australia, Costa Rica, Denmark, Finland, France, Iceland, Ireland, Japan, Mexico, Norway, Sweden, Switzerland, and the United Kingdom) and one sub-national jurisdiction (i.e., British Colombia) have implemented a CT (http://www.carbontax.org/services/where-carbon-is-taxed/). Baranzini and Carattini (2014) review the main characteristics of carbon taxes and survey the environmental effectiveness of existing carbon taxes by focusing on empirical studies based on real data.