Abstract for the International Forum on Shipping, Ports and Airports (IFSPA 2014)

The implications of market-based measures on the mitigation of aircraft engine emissions

Cherie Lu* and Ming-Tao Chou

1 Department of Aviation and Maritime Management, Chang Jung Christian University, Tainan, Taiwan
*Corresponding Author: No.1, Changda Road., Gueiren District, Tainan City 71101, Taiwan, Tel: +886-6-2785123 ext 2259, Fax: +886-6-2785056, e-mail: cherie@mail.cjcu.edu.tw

Abstract

Despite the economic downturn and unexpected drawbacks, the air transport industry is still forecast to experience a 5-6% annual growth for the next 20 years, with the Asian markets taking the lead. This growth brings more environmental problems, notably climate change, than ever before. The International Civil Aviation Organisation (ICAO), major international aviation organisations and national governments have stated the importance of applying market-based measures (MBMs) as one of the policy options for achieving the sustainable development of the industry. The ICAO council meeting in October 2010 adopted the development of MBMs for the international industry as one of its first priorities. The implementation of a global MBM is scheduled for 2020. The MBMs cover environmental charges, taxes, trading, offset and voluntary agreements generally applied at international, national or airport levels, mainly for the purposes of mitigating greenhouse gases (GHGs) emitted from aircraft engines. This paper reviews the current applications of MBMs in the air transport industry worldwide and investigates the differences between, and purposes of, various measures, with a view to establishing generic systematic approaches in market-based measures. An econometric model is developed for evaluating the various variables which influence the airlines’ choices in responding to the application of different MBMs. The results lead in turn to an estimation of the effects of various MBMs. The outcomes will assist policy makers in applying MBMs that are apt for given purposes. The main focus is on various engine emissions from aircraft operations with the main focus on carbon. The scope of the research involves major international air transport organisations, countries, airlines and airports which have applied MBMs. The research results and the suggestions will serve as a good reference for government as well as the industry when facing the global environmental challenges of the move towards sustainable development.

Keyword: Market-based measures, aircraft engine emissions, greenhouse gases, carbon trading and offset, econometric model