

# Chapter 11

## RCA vs. RTA and Sectoral Import vs. RTA: First Empirical Evidence for Turkey

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### ABSTRACT

*In mainstream literature, it is argued that technological specialization patterns of countries should be in accordance with their trade specialization pattern. In empirical applications, a Revealed Technological Advantage (RTA) index is used to measure technological specialization while a Revealed Comparative Advantage (RCA) index is used to measure trade specialization patterns. This chapter provides an extensive analysis of the relation between RTA and RCA of seven developed countries (Germany, France, Italy, Japan, The Netherlands, the UK, and the USA) for twenty-one manufacturing sectors. RCA indexes are calculated by using worldwide export data whereas RTA indexes are measured by patents granted in Turkey over the period 1990-2006. Although a bird's eye view supports a relation, there has not been a strong statistical validation of the relationship between these two variables; in addition, this chapter investigates whether RTA is related to the sectoral import ratio of Turkey for each country. Empirical findings indicate that the direction of the relationship between the sectoral import ratio and RTA varies according to the technological composition of sectors for each country.*

### 1. INTRODUCTION

The 1980s and the following decades have witnessed worldwide changes and transformations. Faced with the debt crises and later with the adherence of World Trade Organization (WTO),

many countries opened up their economy to more international trade, capital movements, and foreign direct investment. The World Trade Organization (WTO) not only includes rules concerning trade and capital movement liberalization but includes rules concerning intellectual property rights as well. Endorsement of WTO means adherence to

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the rules of trade related aspects of intellectual property rights (TRIPS). TRIPS requires members to apply stricter and stronger rules and a comprehensive coverage of technologies for patent rights.

TRIPS provides legal framework for firms to protect their patent rights globally irrespective of the technology of the innovation. Patent grants provide exclusive rights to firms in terms of production, usage, selling, marketing, and trading the product or process invention/innovation. In this respect, firms obtain patent rights for several reasons. The main reasons for firms to patent are to prevent competitors from patenting a similar invention (OECD, 1994, p. 15; Cohen, et al., 2000) to earn royalty income and to gain access to foreign markets (Levin, et al., 1987; OECD, 1994).

Global patenting activities of Multi-National Corporations (MNCs) and their degree of involvement with technological activity in the host country may indicate their technological capacity in their home country. These large firms to a considerable extent determine, and in turn are influenced by, sectoral technological specialization patterns of their home countries. Major empirical evidence for this observation comes from Patel and Pavitt (1995). Measured by patenting activity in the USA for the period between 1960s and 1990s, the top 20 large firms' technological developments are in line with their countries' technological strengths or weaknesses. That is, uneven technological development among firms is the mirror image of the relative strengths or weaknesses of their countries in a specific technological field. These findings are similar to the results of the analysis of RTA for different countries (Patel & Pavitt, 1995).

Global patenting behaviors of MNCs reflect not only their technological but also their trade specialization pattern. Investigation of the patenting activities of MNCs in a time series perspective and for destination countries reveals the marketing and production strategies of these firms (OECD, 1994). If MNCs have intentions to trade or produce in foreign markets, then they protect themselves by granting their patent rights in the host country.

By doing this, firms can obtain legal protection against potential imitators. Hence, technological composition of patents should be in accordance with technological composition of trading of firms/countries. In other words, outbound international patenting should be related to trading pattern of firms. Madsen (2008) found that exporters' patents applied for in their export markets was the single most important factor behind the surge in exports in the 1990s for the OECD countries.

This chapter empirically investigates whether the pattern of technological specialization of countries is compatible with the pattern of trade specialization for the period between 1990 and 2006 for seven developed countries for a total 21 industrial sectors. Countries considered are Germany, France, Italy, Japan, The Netherlands, the United Kingdom, and the USA. The reason for the choice of these countries is the fact that these countries have higher shares of patent grants in Turkey compared to other countries. Prior hypothesis is that patterns of export specialization are expected to be highly correlated with patterns of technological specialization. With the more globalized and integrated world, it is further hypothesized that patents taken in any country should reflect these countries' technological specialization pattern. Hence, for an indicator of technological specialization, Revealed Technological Advantage index (RTA) is calculated by using patents taken in Turkey by these countries for the total 21 manufacturing sectors. As an indicator of export specialization, Revealed Comparative Advantage (RCA) is calculated for each country and each sector by using worldwide export data.

This chapter also investigates whether sectoral bilateral import of Turkey with seven developed countries are in conjunction with RTA calculated by using granted sectoral patents in Turkey for these countries. Since there is virtually no published research and evidence for the link between sectoral trade flows and protected patent rights for Turkey, this study intends to fill this gap. This chapter organized as follows: In section two, the

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