



## Does competition have a relationship with efficiency and productivity?

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### Abstract

**Aim:** The purpose of this research is to determine whether or not there is a correlation between the level of competition in a given competition and the level of efficiency or productivity achieved by that market. With this in mind, the study's primary objective is to determine whether or not intense competition affects efficiency and productivity.

**Method:** The current investigation takes a descriptive approach to its presentation of data. Information was gathered from books and articles already published. The findings were derived from a comparative analysis.

**Findings:** When competition is healthy, the market sends firms clear signals (such as the prices they can charge and the profits they can earn) about the goods and services consumers want to purchase. Therefore, it can be said that competitiveness is linked to effectiveness and output.

**Implications/Novel Contribution:** The importance of the study is articulated through the connection between the three concepts of competition, efficiency, and productivity, which are not fully developed in the papers cited in the literature review. The presented relationship with the existing literature review can be dealt with in future studies, and unfavorable aspects of the relationship can also be embraced.

*Keywords:* Efficiency, Productivity, Competition

**Received:** 10 June 2019 / **Accepted:** 8 July 2019 / **Published:** 19 August 2019

### INTRODUCTION

First, the study defines efficiency, discusses its significance, and provides an analysis in its own section; next, it defines efficiency and effectiveness in its own section. The literature review on efficiency concludes this section. The second part of productivity examines the meaning and value of productivity and the existing literature on the subject. Competition in terms of efficiency and productivity, which is also highlighted in the study's methodology, is the focus of the third section.

Following these justifications, the following sections should be included: introduction, literature review, methodology, main body, results, and conclusion. References and directions for further study are also discussed. The literature review contains studies of central importance to this investigation. The methodology has dealt with the study's intent. To provide a definitive response to the question, "Does competition have a relationship with efficiency and productivity?" this study will also attempt to answer a second related question. It is possible to break down the question of whether or not competition affects efficiency and productivity into separate hypotheses in this way. The relationship between competition and efficiency and between competition and productivity is part of the first sub-hypothesis. Specifically, the hypotheses mentioned above and their nested hypotheses are answered by surveying relevant publications.

Additionally, the methodology and literature review are integrated into a single section. Because the papers cited in the literature review do not fully develop the connections between competition, efficiency, and productivity, the significance of the study has been defined by the significance of these three variables among themselves. Furthermore, the research aims to help shed light on the problem that needs to be solved. Rejecting H0 and accepting H1 are supported by the literature review of efficiency and productivity, respectively, as demonstrated by the research objectives via the main and sub-hypothesis.

In the end, the question of whether or not competition is related to efficiency and productivity has positive

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meanings that are also expressed in the results. This paper concludes by demonstrating the connection between efficiency/productivity and competition. There are positive effects of competition on both efficiency and productivity. The presented relationship can be dealt with in future studies either through an actual literature review or by embracing the negative facets of the relationship. After additional studies, the citations are also outlined for convenience.

## LITERATURE REVIEW

Balkan and Arıkan (2010), Çetin (2010), Dinç and Haynes (1999), N. Doğan and Ersoy (2017), Eroğlu and Atasoy (2006), Bakırcı (2006), Holmes, Hsu, and Lee (2014), Jacobs (2001), Yükçü and Atağan (2009), McGlynn et al. (2008), Özden (2008), Salant and Siegel (2016), Varian (1974), handled efficiency in related papers.

In compliance with the competition-efficiency hypothesis, increases in competition leads up to increases in (profit) efficiency. This hypothesis is derived from the efficient structure hypothesis proposed by Demsetz (1973), Schaeck and Čihák (2008).

Esirgen and Gültekin (2005), Göçer and Peker (2014), Güngör and Felekoğlu (2018), Lovell (2003), Lorcu (2010), Prokopenko and North (1996), Vergil and Abasız (2008), Yerlikaya (2010), addressed productivity in their studies.

If the competition works effectively, clear messages will be sent to firms from the market (for instance, in the shape of the prices they can charge and the profits they can earn) about which goods and services consumers want to buy. Efficient firms that offer the products that consumers want at low prices will get better, and inefficient ones will not (Competition and Markets Authority, 2015; Vickers, 1995).

Ö. İ. Doğan, Marangoz, and Topoyan (2003), Gökmenoğlu, Akal, and Altunışık (2012), Keskin, Kalaycıoğlu, and İnce (2017), Öngüt (2007), Seviçin (2009), concerned with productivity in their papers mentioned below.

Based on a series of studies on Nickell (1996)'s highly cited 1996 article, CEP - CentrePiece research concluded that increases in competition provided a large and persistent pressure to (firm) productivity (Van Reenen, 2011).

## METHODOLOGY

This study aims to answer two questions to have a unique answer; does competition have a relationship with efficiency and productivity. In other words;

Main Hypothesis: Whether competition has a relationship with efficiency and productivity or not.

Sub-Hypothesis 1) Whether competition and efficiency have a relationship or not.

**H0:** Competition and efficiency don't have a relationship with each other.

**H1:** Competition and efficiency have a relationship with each other.

Sub-Hypothesis 2) Whether competition and productivity have a relationship or not.

**H0:** Competition and productivity don't have a relationship with each other.

**H1:** Competition and productivity have a relationship with each other.

Abovesaid hypothesis and sub-hypotheses are solved via literature review of related topics.

## RESULTS AND DISCUSSION

### Efficiency

This section includes the definition and importance of the term and specific properties of it as presenting its use in literature.

### Definition of Efficiency

Efficiency can be defined with two components as technical efficiency and allocative efficiency. If a firm is not obtaining maximal output from a set of inputs, technical inefficiency occurs and when a firm fails to choose the optimal balance of inputs at given input prices (even in case of obtaining maximal output from the inputs actually

used), allocative inefficiency occurs (Rogers, 1998).

Rogers (1998) remarks about the essential constituents of efficiency as its technical and allocative properties, relating both with obtaining maximal input and choosing the optimal balance (Rogers, 1998).

### **Importance of Efficiency**

Efficiency is a critical element of development in view of the fact that it can be more easily to be emphasized in the private sector than in the public sector, whose activities are directed, primarily, towards covering the needs of citizens, to a greater extent, as far as possible, the allocation of resources being related to supply of goods and services (Florina, 2017).

#### *Analysis of efficiency*

Analysis of efficiency can be classified into three categories as follows (Rogers, 1998):

- Data envelopment analysis
- Stochastic production frontier approach
- Panel data methods

#### *Efficiency and effectiveness*

In addition to efficiency, the concept of effectiveness can be shortly explained in this framework.

Effectiveness can be explained with the relationship between inputs and the social states vector (Burkhead & Hennigan, 1978).

### **Specific Properties of Efficiency: Literature Review**

- Varian (1974) examined the concept of equity together with two more concepts.
- Dinç and Haynes (1999) investigated the sources of regional inefficiency.
- Jacobs (2001) used two alternative methods to examine hospital efficiency.
- Eroğlu and Atasoy (2006) focused on efficiency measurement with data envelopment analysis and sensitivity analysis of efficient decision-making units.
- Bakırçı (2006) determined efficiencies on sectoral basis by using data envelopment analysis.
- Özden (2008) studied on efficiency evaluation of foundation universities in Turkey by using data envelopment analysis.
- McGlynn et al. (2008) prepared a report on identifying, categorizing and evaluating health care efficiency measures.
- Yükcü and Atağan (2009) concentrated their paper on confusion on effectiveness, efficiency and productivity.
- Balkan and Arıkan (2010) performed to determine secondary school education efficiencies of a province by data envelopment analysis that will help to identify the numbers of required classrooms and teachers for increasing the quality of education.
- Çetin (2010) presented an essay on economic efficiency in the context of the X-efficiency approach.
- Holmes et al. (2014) examined the welfare gains from trade with allocative efficiency and mark-ups.
- Salant and Siegel (2016) conducted a study on reallocation costs and efficiency.
- N. Doğan and Ersoy (2017) implemented an efficiency measurement via a case study of a firm in the textile sector.

### **Productivity**

Definition and importance of the term productivity are presented in this section with specific properties of it showing its use in literature.

#### **Definition of Productivity**

Productivity can be considered as how effectively value (output) is produced from inputs which can be explained with people, capital equipment, land, energy, and so forth (Beatson & Zheltoukhova, 2015).

According to [Beatson and Zheltoukhova \(2015\)](#), productivity can be pointed out as how effectively output is produced from inputs, in short definition ([Beatson & Zheltoukhova, 2015](#)).

### **Importance of Productivity**

In the framework of most common measures of productivity which are widely used by economists and business analysts, one can start with the most basic concept of labor productivity and then proceed with the total factor productivity ([Steindel & Stiroh, 2001](#)):

- Labor productivity (a simple definition is real output per hour of work)
- Total factor productivity (a simple definition is real output per unit of all inputs and is a more difficult concept than the first one).

In another perspective, the types of productivity can be examined in three subheadings; partial productivity, multi-factor productivity and total productivity ([Yükçü & Atağan, 2009](#)).

### **Specific Properties of Productivity: Literature Review**

- [Prokopenko and North \(1996\)](#) published a modular programme on productivity and quality management.
- [Lovell \(2003\)](#), evaluated the decomposition of Malmquist productivity indexes.
- [Esirgen and Gültekin \(2005\)](#) focused on the evaluation of reinforced concrete and structural steel construction technologies by productivity criteria.
- [Vergil and Abasız \(2008\)](#) studied total factor productivity, estimation and relationship between growth and productivity.
- [Yerlikaya \(2010\)](#), presented a study on technical effectiveness as a component of total factor productivity.
- [Lorcu \(2010\)](#) analyzed total factor productivities with the Malmquist productivity index in an application of Turkish automotive industry.
- [Göçer and Peker \(2014\)](#) analyzed the productivity effects of foreign direct investment.
- [Güngör and Felekoğlu \(2018\)](#) conducted a study on the concept, development and implementation process of eco-efficiency.

### **Competition**

In this section, competition is handled from the perspective of efficiency and productivity with a literature review.

- [Ö. İ. Doğan et al. \(2003\)](#) executed a sectoral study on factors affecting competitive advantage of businesses in domestic and foreign markets.
- [Öngüt \(2007\)](#) handled the Turkish textile and clothing industry about adaptation to the changing worldwide competitive conditions.
- [Seviçin \(2009\)](#) presented an investigation on sustainable competitive advantage concept.
- [Gökmenoğlu et al. \(2012\)](#), had a study of review on factors determining national competitiveness.
- [Keskin et al. \(2017\)](#) examined the relationship between export capabilities and competitive advantage with an investigation on Turkish exporters.

### **Discussion**

In compliance with the competition-efficiency hypothesis, increases in competition leads up to increases in (profit) efficiency. This hypothesis is derived from the efficient structure hypothesis proposed by [Demsetz \(1973\)](#) ([Schaeck & Čihák, 2008](#)).

Having the sub-hypothesis of whether competition and efficiency have a relationship or not;

**H0:** Competition and efficiency don't have a relationship with each other.

**H1:** Competition and efficiency have a relationship with each other.

Rejection of H0 and acceptance of H1 are supported with a literature review of efficiency.

If the competition works effectively, clear messages will be sent to firms from the market (for instance, in the shape of the prices they can charge and the profits they can earn) about which goods and services consumers

want to buy. Efficient firms that offer the products that consumers want at low prices will get better, and inefficient ones will not (Competition and Markets Authority, 2015; Vickers, 1995).

Based on a series of studies on Nickell's highly cited 1996 article, CEP - CentrePiece research concluded that increases in competition provided a large and persistent pressure to (firm) productivity (Van Reenen, 2011).

Having the sub-hypothesis of whether competition and productivity have a relationship or not;

**H0:** Competition and productivity don't have a relationship with each other.

**H1:** Competition and productivity have a relationship with each other.

Rejection of H0 and acceptance of H1 are supported with a literature review of productivity.

Herewith; the question of whether competition has a relationship with efficiency and productivity or not, has answered with positive meanings.

## CONCLUSION, RECOMMENDATIONS AND IMPLICATIONS

This paper, with three main topics brought up; firstly comprises efficiency section which consists of the definition and importance of the term and specific properties of it as its use in literature and subsequently it places emphasis on productivity in following section. The aforementioned section also contains the definition and importance of productivity in addition to its literature review of its specific properties. The last section of three main topics supported these two terms as a result of effects of it in positive way which was also pointed in the methodology and literature review of study.

Finally, this paper shows the relationship between these two terms (efficiency, productivity) and competition. In other words, the relationship between competition and efficiency; and the relationship between competition and productivity also have influences positively. Future researches can handle the presented relationship with actual literature review or negative ways of the relationship can also be embraced.

## REFERENCES

- Bakırcı, F. (2006). A measurement of efficiency on sectoral basis: An analysis with DEA. *Atatürk University: Journal of Economics and Administrative Sciences*, 20(2), 199-217.
- Balkan, D., & Arkan, M. (2010). Measuring secondary school education efficiencies of Sivas by data envelopment analysis. *Cumhuriyet University Journal of Economics and Administrative Sciences*, 11(2), 133-154.
- Beatson, M., & Zheltoukhova, K. (2015). *Productivity: Getting the best out of people* (Technical report). Chartered Institute of Personnel and Development, Policy Report, United Kingdom.
- Burkhead, J., & Hennigan, P. J. (1978). Productivity analysis: A search for definition and order. *Public Administration Review*, 38(1), 34-40. doi:<https://doi.org/10.2307/975408>
- Çetin, T. (2010). An essay on economic efficiency: X efficiency approach. *Doğuş University Journal*, 11(2), 183-198. doi:<https://doi.org/10.31671/dogus.2019.161>
- Competition and Markets Authority. (2015). *Productivity and competition: A summary of the evidence* (Technical report). CMA45, United Kingdom.
- Demsetz, H. (1973). Industry structure, market rivalry, and public policy. *The Journal of Law and Economics*, 16(1), 1-9. doi:<https://doi.org/10.1086/466752>
- Dinç, M., & Haynes, K. E. (1999). Sources of regional inefficiency: An integrated shift-share, data envelopment analysis and input-output approach. *The Annals of Regional Science*, 33(4), 469-489. doi:<https://doi.org/10.1007/s001680050116>
- Doğan, N., & Ersoy, Y. (2017). Efficiency measurement: A case study of a firm in the textile sector. *Hitit University Journal of Social Sciences Institute*, 10(1), 35-44. doi:<https://doi.org/10.17218/hititsosbil.285265>
- Doğan, Ö. İ., Marangoz, M., & Topoyan, M. (2003). Factors affecting competitive advantage of businesses in domestic and foreign markets and an application. *Dokuz Eylül University: The Journal of Graduate School of Social Sciences*, 5(2), 114-138.
- Eroğlu, E., & Atasoy, M. C. (2006). Efficiency measurement with data envelopment analysis and sensitivity analysis of the efficient decision making units. *Istanbul University Journal of the School of Business Administration*, 35(2), 73-89.

- Esirgen, H. B., & Gültekin, T. A. (2005). Evaluation of reinforced concrete and structural steel construction technologies by productivity criteria. *Journal of the Faculty of Engineering and Architecture of Gazi University*, 20(4), 507-516.
- Florina, P. (2017). Elements on the efficiency and effectiveness of the public sector. *Ovidius University Annals, Economic Sciences Series*, 17(2), 313-319.
- Göçer, İ., & Peker, O. (2014). Productivity effects of foreign direct investment: A comparative cointegration analysis with multiple structural breaks in Turkey, China and India sample. *Verimlilik Dergisi*, 1, 7-40.
- Gökmenoğlu, S. M., Akal, M., & Altunışık, R. (2012). A review on factors determining national competitiveness. *Competition Journal/Rekabet Dergisi*, 13(4), 3-43.
- Güngör, B., & Felekoğlu, B. (2018). The concept, development and implementation process of eco-efficiency. *Journal of Balkesir University Institute of Science and Technologys*, 20(3), 90-104. doi:<https://doi.org/10.25092/baunfbcd.481167>
- Holmes, T. J., Hsu, W.-T., & Lee, S. (2014). Allocative efficiency, mark-ups, and the welfare gains from trade. *Journal of International Economics*, 94(2), 195-206. doi:<https://doi.org/10.1016/j.jinteco.2014.07.002>
- Jacobs, R. (2001). Alternative methods to examine hospital efficiency: Data envelopment analysis and stochastic frontier analysis. *Health Care Management Science*, 4(2), 103-115. doi:<https://doi.org/10.1023/A:1011453526849>
- Keskin, H., Kalaycıoğlu, O., & İnce, H. (2017). Relationship between export capabilities and competitive advantage: An empirical investigation on Turkish exporters. *Dogus University Journal*, 18(2), 51-68. doi:<https://doi.org/10.31671/dogus.2018.31>
- Lorcu, F. (2010). Malmquist productivity index: An application of Turkish automotive industry. *Istanbul University Journal of the School of Business Administration*, 39(2), 276-289.
- Lovell, C. K. (2003). The decomposition of Malmquist productivity indexes. *Journal of Productivity Analysis*, 20(3), 437-458. doi:<https://doi.org/10.1023/a:1027312102834>
- McGlynn, E. A., Shekelle, P. G., Chen, S., Goldman, D., Romley, J., Hussey, V. H., P., ... Shanman, R. M. (2008). *Identifying, categorizing, and evaluating health care efficiency measures*. Retrieved from <https://bit.ly/2oLNxqa> (Accessed on 15 September, 2018)
- Nickell, S. J. (1996). Competition and corporate performance. *Journal of Political Economy*, 104(4), 724-746. doi:<https://doi.org/10.1086/262040>
- Öngüt, Ç. E. (2007). *Turkish textile and clothing industry's adaptation to the changing competitive conditions*. Istanbul, Turkey: Devlet Planlama Teşkilatı.
- Özden, Ü. (2008). Data Envelopment Analysis (DEA) by measuring the activity of the foundation universities in Turkey. *Istanbul University Faculty of Business Journal*, 37(2), 167-185.
- Prokopenko, J., & North, K. (1996). *Productivity and quality management: A modular programme - part i: High potential productivity and quality improvement areas*. Tokyo, Japan: Asian Productivity Organization.
- Rogers, M. (1998). *The definition and measurement of productivity* (Working Paper no 9/98). Melbourne Institute of Applied Economic and Social Research, Melbourne, Australia.
- Salant, Y., & Siegel, R. (2016). Reallocation costs and efficiency. *American Economic Journal: Microeconomics*, 8(1), 203-227. doi:<https://doi.org/10.1257/mic.20140262>
- Schaeck, K., & Čihák, M. (2008). *How does competition affect efficiency and soundness in banking? New empirical evidence* (Working paper no 932). European Central Bank, Frankfurt, Germany.
- Seviçin, A. (2009). An investigation on sustainable competitive advantage concept. *Zonguldak Karaelmas University Journal of Social Sciences*, 5(10), 171-185.
- Steindel, C., & Stiroh, K. J. (2001). *Productivity: What is it, and why do we care about it?* (Technical report). FRB of New York, New York, NY.
- Van Reenen, J. (2011). Big ideas: How competition improves management and productivity. *Centrepiece*, 16(1), 10-13.
- Varian, H. R. (1974). Equity, envy, and efficiency. *Journal of Economic Theory*, 9(1), 63-91.
- Vergil, H., & Abasız, T. (2008). Total factor productivity, estimation and relationship between growth and

- productivity. *Kocaeli University Journal of Social Sciences*, 16(1), 160-188.
- Vickers, J. (1995). Concepts of competition. *Oxford Economic Papers*, 47(1), 1-23. doi:<https://doi.org/10.1093/oxfordjournals.oep.a042155>
- Yerlikaya, Ö. (2010). Technical efficiency as a component of total factor productivity: An empirical study on private manufacturing industry of Turkey with stochastic production frontiers. *Istanbul Sosyal Bilimler Dergisi*, 2, 45-54.
- Yükçü, S., & Atağan, G. (2009). Complexity created by the concepts of effectiveness, efficiency and productivity. *Ataturk University Journal of Economics and Administrative Sciences*, 23(4), 1-13.