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Competition and Economic Growth: An Empirical Analysis with Special Reference to MENA Countries

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Abstract

The underlying study analyzes the impact of competition on economic growth, and tests whether this impact might change according to the technological gap between the observed country and the technological leader country. Using panel data estimation for a sample of 115 countries over the period 1995-2010, and controlling for the MENA countries in the sample, the results suggest that intensive domestic competition, proxied by business freedom, tends to hinder the growth rate of an economy independent of the country's distance from the technological frontier, providing evidence in support to the Schumpeterian argument. However this effect is almost negligible for MENA countries. On the other hand, the impact of competitive pressures from foreign markets, measured by trade freedom, is dependent on the country's technological gap. In particular, the results show that trade freedom has a stronger negative impact on growth as countries move closer to the technological frontier. Such an impact of trade freedom on growth applies to all countries, including MENA ones.

Keywords: Competition, Economic Growth, Business Freedom, Trade Freedom, Technological Gap, Panel Data

JEL classification: D40, L40, O40, O50, C23, E61

1. Introduction

Competition is of great importance to the functioning of market economies. It helps create an environment that enhances efficiency. It enhances allocative efficiency by securing that supply conforms to consumer preferences and resources are directed to their most valued use. It enhances productive efficiency by minimizing production costs. and enhances dynamic efficiency by setting incentives for the development of new products and production techniques. Hence, for politicians and policymakers, competition is not a goal per se, but a means to stimulate more efficiency, which in turn contributes to improved productivity, accelerated economic growth and higher consumer welfare (Don *et al.*, 2008).

Nevertheless, the beneficial functioning of competition is not secured spontaneously, but requires support by state action by setting and implementing appropriate competition policy (Voigt, 2009). Competition policy comprises the set of measures and instruments used by governments to safeguard and promote competition in markets. A comprehensive competition policy has two main components. The first one includes competition law and its effective implementation to prevent anti-competitive behavior by businesses, rule out the abusive market behavior of a dominant firm, regulate potentially anti-competitive mergers and minimize unwarranted government controls. The other component refers to a set of different policies designed to ensure the satisfactory functioning of a market economy comprising relaxed industrial policies, liberalized trade policy, privatization, favourable entry and exit conditions and a greater reliance on market forces (Krakowski, 2005, Sengupta and Dube, 2008).

In recent years, there has been a widespread trend towards markets liberalization and the adoption of competition policies. The ultimate objective of competition policy is generally agreed to be the attainment of economic growth, through the impact of the former on market competition. In this context, competition is an intermediate objective and economic growth is the final goal (UNCTAD, 2010). However, the link between competition policy and economic growth is neither straightforward nor clearly distinct in terms of observed reality. The extent to which economies of countries that have adopted competition policies are performing better than those still to adopt is not quite apparent (Dube, 2008). Such an unclear relationship could be attributed to two main issues: the controversial relationship between market competition and economic growth, and the presence of obstacles to the effective implementation of competition policies.

On one hand, a fundamental divorce has been noted between theorists and empiricists who work on the relationship between competition and economic growth. While some early models of endogenous technical change predict that competition will curb innovation, in line with the Schumpeterian theory, more recent research points to competition and the policies affecting it as important determinants that spur productivity growth (Bourlès *et al.*, 2010). On the other hand, many countries face different hurdles which render the implementation process of competition policies less efficient in a way that leaves competition non-existent in most markets. In fact, it is harder to implement competition policy in developing countries than in developed ones. This is due to various market characteristics and enforcement difficulties, including the presence of large informal sectors, nexus between government officials and large firms, ineffectual rule of law, absence of competition culture, capacity constraints, high transaction costs and unfavourable business environment (UNCTAD, 2010).

Against this background, the current study seeks to analyze the effects of competition on economic growth, and test whether this impact depends on the technological distance between the country under consideration and the country which is the technological leader. This analysis is important in order to verify whether competition-enhancing policies can help accelerate economic growth, and to derive implications regarding the appropriate design and requirements for the effective implementation of such policies. In this regard, the study adopts a macro-level analysis to capture the economy-wide effects of competition, since competition policies are usually conducted in a uniform way without distinction among industries. Accordingly, the general framework of the underlying work complements the orientation of other studies interested in the impact of sector regulation on productivity growth of certain industries or sectors.

The remainder of the paper is organized as follows: Section 2 presents a brief review of the existing literature regarding the relationship between competition and economic growth. Section 3 outlines data and methodology, then presents the empirical analysis and discusses the results. Finally, section 4 concludes with policy recommendations.

2. On the Effects of Competition on Economic Growth: A Review of the Literature

2.1 Theoretical Basis

According to standard economic theory, competition is defined as a market situation in which suppliers strive for consumers in a way that induces them to become more efficient and capable of offering a wide variety of products and services at lower prices. Economists have long been interested in analyzing the role of competition for innovation and economic growth, hence, many theoretical arguments as well as empirical studies trying to explain such relationship were presented in literature. In general, theoretical models identify two opposing effects regarding the role of competition for innovation and growth.

Conventional wisdom - dating back to Adam Smith - predicts that competition induces a better allocation of resources and spurs efficiency, which ultimately increases consumer welfare and promotes economic growth. In a competitive market a product will be offered at a price based on the competition between different suppliers, while if there is no sufficient competition, as in the case of a monopolized or cartelized economy, market participants may obtain dominant market positions that allow them to set higher prices in their favor, hindering allocative efficiency from materializing which in turn leads to lower growth rates. Moreover, the fight for and the defence of monopolies may lead to a misallocation of investments, which further results in a loss in economic efficiency (Romero, 2003, Voigt, 2009, Petersen, 2013).

On the other hand, Schumpeter (1942) claimed that monopolies are more innovative than firms with small or even negligible market shares since they are able to offer their products at a higher price than in a competitive market, which will allow them to reap greater returns to their innovations. Consequently, Schumpeter argued that competition is detrimental to innovation and thus hampers rather than foster economic growth, as it reduces such monopoly rents that reward successful innovators and thereby discourages R&D investments, whereas monopoly market structures would lead to higher rates of innovation and subsequently growth pointing to a tradeoff between static and dynamic efficiency. Schumpeter's hypothesis has been used to justify the creation of national champions (Voigt, 2009).

Amid the above arguments, Aghion et al. (1997) and Aghion et al. (2001) extended the Schumpeterian growth framework and managed to develop new models of competition and growth by introducing the possibility that more competition could be conducive to innovation

and economic growth through the "*escape-competition*" effect. More precisely, competition may increase the incremental profits from innovating, and thereby encourage R&D investments aimed at "escaping competition", particularly in sectors where incumbent firms are operating at similar technological levels; i.e. "neck-and-neck" sectors, since intensive competition between firms will increase each firm's incentive to acquire or increase its technological lead over its rivals.

Furthermore, new endogenous growth models introduce the notion of "technological distance" and underline its significant role in determining the impact of competition on innovation. They postulate that competition could have opposite effects on innovation incentives depending on whether firms were initially closer to or farther below the fringe in the corresponding industry. In particular, new endogenous growth models predict that competition should be growth-enhancing in sectors where incumbent firms are close to the technological frontier and/or compete "neck-and-neck" with each other, since in those sectors the "*escape competition*" effect should be the strongest. On the contrary, competition reduces innovation incentives and therefore productivity growth in industries where innovating firms are far below the frontier, as the *Schumpeterian effect* is more likely to dominate in these sectors (Aghion and Howitt, 2005).

In light of the above, it is clear that there is no consensus in the literature on the effects of competition on growth, yet the aforementioned arguments assure that economists do recognize the fact that the nature of competition prevailing in the market will have an impact on innovation and growth. This in turn implies that adopting competition policy to induce competition will affect the incidence of innovations, and accordingly will influence economic growth. Subsequently, it became widely accepted among scholars and policymakers that growth-enhancing competition policies require careful assessment of a country's economic, social and institutional setup, which will affect both the design as well as the implementation of such polices.

In this context, Aghion and Howitt (1998) build upon Gerschenkron's idea of "appropriate institutions" and emphasize the role of "technological distance" in the growth process; claiming that different institutions or policy designs will affect productivity growth differently depending on a country's distance to the world technological frontier (Aghion and Howitt, 2005). Along the same line of thought, the recent literature on endogenous growth theory, based on Acemoglu et al. (2006), indicates that the distance from the technological

frontier is the key to determining the growth-enhancing economic policies to be adopted. The argument is based on the following reasoning: For countries with low levels of technology i.e. far from the frontier, it is recommended that they follow an imitation-based economic policy to exploit the results of existing innovations. In terms of competition policy, this means that trade liberalization is more favorable for these countries in order to attract foreign direct investment and promote technological progress through the adoption of foreign technologies. On the contrary, business liberalization in this stage discourages investing in research and development and hence innovation, since the higher entry threat of technologically advanced firms decreases the incumbent's expected pay-off from innovating.

On the other hand, as countries get closer to the technological frontier, the economic policy adopted should aim at promoting innovation in order to invent new products and production techniques or improve the quality of the existing ones. Within competition policy context, this implies that business liberalization is more beneficial for such countries, since the increased possibility of entry in the market and thus the higher potential competition from the incumbent firm incentivizes both the incumbents and the entrants to invest more in innovation, as it offers the only way to survive in the market (Scopelliti, 2009).

2.2 Empirical Literature

The impact of competition on innovation and economic growth has largely been explored empirically, both at micro and macro levels. Early empirical literature was pioneered by the work of Scherer (1967), followed by Cohen and Levin (1989), and more recently by Geroski (1995), Nickell (1996) and Blundell et al. (1999). Those papers employed linear estimations and they all point to a positive correlation between competition and growth, while using several alternative measures of competition, including the inverse of market concentration, the inverse of the Lerner index or the number of competitors for each firm in the survey. However, none of these studies reveal the reasons why competition can be growth-enhancing or why the Schumpeterian effect does not seem to hold (Aghion and Howitt, 2005).

Deeper empirical analysis was undertaken by employing non-linear estimations, and subsequently an inverted-U relationship between competition and growth has been captured in different empirical studies; showing that an increase in competition initially increases growth, but reduces it beyond a threshold level. Using firm-level data, Scott (1984) found an inverted-U relation between R&D intensity and market concentration, when not controlling

for industry characteristics, while Levin et al. (1985) reported a similar pattern at the industry level. Later, Aghion et al. (2002) showed a strong bell-shaped relationship between competition and innovation by analyzing a group of industries in the UK in the period 1968–1997. However, these studies are confined to firm and industry level analyses and do not capture the economy-wide effects of competition.

Several studies try to focus on measuring the effect of competition policy on economic indicators such as economic growth, productivity, and the level of competition. Dutz and Hayri (1999) developed different sets of variables related to policy, structure and mobility in an attempt to provide a richer picture of the intensity of economy-wide competition. Conducting a cross country study, they find that measures of effective competition policy are positively associated with higher rates of economic growth. Nevertheless, they reported that this link appears to be more tenuous for Far Eastern economies. Also, their constructed variables are based on subjective evaluations of surveyed businesspeople which might have some drawbacks.

Dutz and Vagliasindi (2000) try to get away from subjective perceptions of competition and evaluate the effectiveness of competition law implementation in 18 transition economies of Eastern Europe and the former Soviet Union, based on the level of law enforcement, competition advocacy, and institutional-related activities. In their cross-sectional study, they find a positive relationship between effective competition law implementation and expansion of more efficient private firms in the observed countries. Yet, the data is just available for a few countries.

Also, Voigt (2009) estimates the effects of competition law implementation on growth. He proposes a number of indicators on various aspects of competition laws and antitrust authorities that help assess the effectiveness of antitrust regimes in practice. Based on a survey of the activities of various antitrust agencies, he comes up with four indicators concerned with the objectives and instruments of competition laws, the formal basis of the regime, namely the use of economic methods, as well as the *de jure* and the *de facto* independence of the antitrust authority. Using cross-sectional data, Voigt reports that all four variables contribute to explaining differences in total factor productivity. Although the new constructed indicators estimate the effectiveness of an antitrust regime better than the mere evaluation of the "law in the books," their impact is not robust to the inclusion of indicators for the general quality of institutions, as reported by the study. In addition, they are not

available in time-series data to allow for tracking the long-term effects of competition law implementation on growth.

Furthermore, Buccirossi et al. (2012) construct an index for the effectiveness of an antitrust regime based on evaluating different elements of antitrust laws and agencies, such as the independence of antitrust authority, their investigation powers, their budget, and the potential sanctions for antitrust violations. Using the newly created index, the study report a positive and significant effect of competition law on the growth rate of total factor productivity for 22 industries in twelve OECD countries over the period 1995–2005. Again, this index only covers a few countries.

Other studies also show opposing trends. For instance, Winston and Crandall (2003) present several case studies to assess the effects of antitrust policy and enforcement on consumer welfare. They show that antitrust regulation in the areas of monopolization, collusion, and mergers does not influence the development of market prices and hence does not benefit consumers; rather they find evidence that it may have lowered consumer welfare in some cases. Furthermore, Young and Shughart (2010) analyze annual time series data over the period 1947-2003 on three measures of federal antitrust law and report evidence that antitrust interventions act like negative technology shocks to productivity growth, and that antitrust policy does not generate subsequent offsetting net increases in productivity.

Following the relevant theoretical propositions, the concept of "technological distance" is also considered in recent empirical studies that try to analyze the effect of antitrust regulation on productivity and innovation, depending on the distance to technological frontier. Acemoglu et al. (2006) use cross-country panel data to show that high barriers to entry become increasingly detrimental to growth as the country approaches the frontier. Accordingly, they argue that less competitive environments may foster growth at early stages of development (i.e. in countries far from the frontier), but later will hamper growth and prevent convergence to the frontier. Similarly, Aghion et al. (2009) find that the threat of technologically advanced entry increases innovation incentives in sectors close to the technology frontier, where successful innovation allows incumbents to survive the threat, but discourages innovation in laggard sectors, where the threat of entry reduces incumbents' expected rents from innovating. Also, Scopelliti (2009) finds business liberalization to be more useful for countries close to the technology frontier, while trade liberalization is more

beneficial for those farther from the frontier, suggesting that trade liberalization should precede business liberalization in developing countries.

In summary, it can be said that the relationship between the overall intensity of competition in an economy and its long run growth is an open question in economics. The literature is quite diverse and does not offer a clear-cut answer. This is also true for the effects of competition policy on the intensity of competition and growth. Accordingly, this issue remains of mounting interest, offering an ample field for further empirical analysis in this regard.

3. Estimation Approach and the Discussion of Results

3.1 Econometric Specification

The study employs a panel data approach to analyze the impact of competition on economic growth for 115 countries over the period 1995-2010; while considering the role of distance from the technological frontier in the growth process, i.e. studying whether the effect of competition on growth may change depending on the technological gap between the observed country and the technological leader country, and controlling for the MENA countries[1] in the sample.

More formally, the general specification of the regression function is as follows:

$$\boldsymbol{Growth_{it}} = \boldsymbol{\alpha} + \boldsymbol{\beta}\, \boldsymbol{Comp_{it-1}} + \boldsymbol{\delta}\, \boldsymbol{TGap_{it-1}} + \boldsymbol{\gamma}\, (\boldsymbol{Comp_{it-1}} * \boldsymbol{TGap_{it-1}}) + \boldsymbol{\partial}\, \boldsymbol{X_{it}} + \boldsymbol{\theta}\, \boldsymbol{D_i} + \boldsymbol{\mu}\, (\boldsymbol{Comp_{it-1}} * \boldsymbol{D_i}) + \boldsymbol{\varepsilon_{it}}$$

where $\boldsymbol{Growth_{it}}$ is a measure of economic growth in country *i* at time *t*, $\boldsymbol{Comp_{it-1}}$ is a measure of competition in country *i* at time *t-1*, $\boldsymbol{TGap_{it-1}}$ is the technological gap for country *i* at time *t-1*, $\boldsymbol{Comp_{it-1}} * \boldsymbol{TGap_{it-1}}$ is an interaction term between the measure of competition and the technological gap for country *i* at time *t-1*, $\boldsymbol{X_{it}}$ is a vector of control variables, $\boldsymbol{D_i}$ is a dummy variable for MENA countries, $\boldsymbol{Comp_{it-1}} * \boldsymbol{D_i}$ is an interaction term between the measure of competition and the MENA countries dummy at time *t-1*, and $\boldsymbol{\varepsilon_{it}}$ is

[1] The study adopts a broad definition of the MENA area including the following countries: Algeria, Bahrain, Cyprus, Djibouti, Egypt, Iran, Iraq, Israel, Jordan, Kuwait, Lebanon, Libya, Malta, Morocco, Oman, Qatar, Saudi Arabia, Sudan, Syria, Tunisia, Turkey, United Arab Emirates, West Bank and Gaza, and Yemen.

the error term. Below is a detailed description for the variables used in the model. Table 1 in the appendix reports the preliminary statistics for all variables.

The Dependent Variable

The dependent variable used in the empirical analysis to reflect the economic growth of a country is the growth rate of GDP. This indicator is appropriate to analyze the economy-wide effects of competition, and thus serves the purpose of the study in deriving recommendations about the appropriate design and implementation of growth-enhancing national competition policies. Data on GDP growth rate is obtained from World Development Indicators (World Bank, 2013).

The Explanatory Variables

Competition depends mainly on barriers to entry that may prevent new firms from accessing the market. A fundamental precondition for the existence of intensive competition is that market entry is fairly easy. This should apply for both domestic and foreign entrants. Thus, competition should be correlated with the absence of bureaucratic impediments to open new businesses and barriers to international trade. Accordingly, the business freedom index and trade freedom index are suggested as proxies for competitive pressures from domestic and foreign markets respectively. The two indices are among the components of the economic freedom index computed yearly by the Heritage Foundation. The main advantage of these indices is that they are available for a large number of countries and for a significant time series, so they can be used to analyse the economy-wide effect of competition on growth in a dynamic perspective.

Business freedom is an overall indicator of the efficiency of government regulation of business. The quantitative score for each country ranges between 0 and 100, with 100 equaling the most free business environment. The score is derived from ten factors measuring the difficulty of starting, operating, and closing a business, based on data from the World Bank's Doing Business study. The Index of Business Freedom is thus proposed as an indicator of the competitive pressures from the internal market due to the existence of other producers or the entry of new firms.

Trade freedom is a composite measure of the absence of tariff and non-tariff barriers that affect imports and exports of goods and services. The trade freedom score is based on two

inputs, namely, the trade-weighted average tariff rate and non-tariff barriers. The quantitative score for each country ranges between 0 and 100, with higher scores corresponding to lower barriers. Accordingly, the trade freedom index is suggested as a measure of the possible competition coming from the external market through the supply of foreign products imported without trade barriers.

Also, based on recent empirical literature on competition and growth, this work takes into account the distance from the technological frontier as a possible determinant of economic growth, both as a single explanatory variable, and also as a factor of an interaction term with both business freedom and trade freedom indices to explore whether the effect of competition on economic growth may change depending on the level of the technological gap between the observed country and the country which is the technological leader. There are several ways which can be used to measure the technological gap. Constrained by data availability, the underlying study follows the existing literature and use labour productivity to compute the technological gap. The leader country (technological frontier) is identified as the country with the highest labour productivity in the sample, while the technological gap is calculated as the ratio of labor productivity of the country under consideration to the labor productivity in the leader country (Scopelliti, 2009). Accordingly, the technological gap variable ranges from 0 to 1, with lower values indicating larger gaps. Labour productivity is measured as GDP per person employed (constant 1990 PPP $), and is obtained from the World Development Indicators.

The business freedom, trade freedom and technological gap variables are all lagged by one period with respect to the dependent variable. This is done in order to avoid endogeneity problems for the explanatory variables, and also to account for gradualism in the effects of business freedom and trade freedom on the growth process, since the impact of entry on incumbent firms' incentives to innovate is not instantaneous, and hence there must be sufficient time until the effects on economic growth are notably realized.

We control for MENA countries by adding two variables: a dummy variable that takes the value 1 for those countries and 0 otherwise, and also an interaction term between the business freedom/trade freedom index and the MENA countries dummy to test whether the effect of competition on economic growth differs in MENA countries than in the rest of the world. The empirical analysis will also include some control variables in order to take into account other possible determinants of economic growth, such as the level of investment measured by gross

capital formation as a percentage of GDP, trade openness measured as the summation of exports and imports relative to GDP, the population growth rate, the inflation rate calculated as the annual percentage increase in consumer prices, and government consumption expenditure as a percentage of GDP. Data for the control variables are obtained from the World Development Indicators.

The econometric strategy followed for testing the relationship between economic growth and competition is to estimate a panel data model. In particular, a random effects model is employed to control for the MENA countries using a dummy variable. In general, a random effects model generates more efficient estimates with higher statistical significance than estimates computed through a fixed effects model.

3.2 Estimation Results

Table 2 presents the regression results when the business freedom index is employed as the main explanatory variable used to proxy competitive pressures from the domestic market. Column 1 depicts a baseline model where only the impact of business freedom and technological gap on economic growth is tested. The results of this model show a negative and significant impact of both variables on GDP growth rate. This implies that more domestic competition slows economic growth, in line with the Schumpeterian hypothesis; and also that the GDP growth rate is higher for countries far away from the technological frontier than for the technologically leader economies, as supported by the theory of convergence.

In column 2, an interaction term between the business freedom index and the technological gap is introduced to study whether the impact of business freedom on GDP growth might change according to the technological gap between the observed country and the technological leader country. The coefficient of business freedom remains negative and significant, while the coefficients for technological gap and the interaction term are insignificant. Business freedom has a negative impact on GDP growth rate and this impact is independent of the country's distance from the technological frontier.

Column 3 depicts regression results when standard economic variables are controlled for. The coefficient of business freedom remains negative and significant, while the coefficients for the technological gap and the interaction term remain insignificant. This indicates that more intensive domestic competition tends to slow down the growth rate of an economy regardless

of the country's technological gap. Such results assert the basic Schumpeterian argument of the tradeoff between static and dynamic efficiency; where competition discourages the incumbents' incentives to innovate and hampers economic growth by sweeping away monopoly rents that reward successful innovators. The standard control variables are all significant and have the expected signs. More precisely, we observe that more trade openness and increased investment enhances economic growth, whereas higher inflation rates and the rapid expansion of government consumption expenditures can slow down the growth of the economy.

We control for MENA countries by introducing the MENA dummy variable, and an interaction term between the business freedom index and the MENA dummy to test whether the effect of domestic competition on economic growth differs in MENA countries. The results of this model are presented in column 4 of table 2. They show that competition has a negative impact on economic growth regardless of the technological gap in all countries, yet this effect tends to be negligible in MENA countries since the coefficient of the interaction term between business freedom and the MENA dummy is significant and with a positive value which almost offsets the negative significant coefficient of the business freedom variable. Also, the coefficient of the MENA dummy is significant and negative indicating that MENA countries start at a lower GDP growth rate.

Table 3 contains the estimation results when the trade freedom index is used as an explanatory variable to proxy competitive pressures from the foreign market. The baseline model results, reported in Column 1, show similar results to the case when the business freedom index was used: a significant negative impact of trade freedom and technological gap on GDP growth rate. This implies that sluggish growth rates are witnessed in the presence of fierce foreign competition, again in accordance with the Schumpeterian argument. Additionally, countries far from the technological frontier grow faster than the economies at the frontier, where the former ones may imitate the advanced technologies of foreign countries while the later ones need to innovate to promote economic growth.

When an interaction term between trade freedom and the technological gap is introduced, the results, shown in column 2, were quite different. Both coefficients of trade freedom and the technological gap turned out to be positive and significant; while the coefficient for the interaction term between the two variables is negative and significant. This means that the impact of foreign entry on economic growth depends on the country's distance to the frontier.

Foreign competition may positively affect economic growth performance, but only for laggard economies whose labour productivity is below 18% of the leader's labour productivity; while competition exerts a discouraging effect on innovation and growth as countries gets closer to the frontier.

Column 3 in table 2 presents the regression results when the standard control variables are added. In this case, the trade freedom coefficient turns out to be insignificant, while the technological gap effect is positive and significant. The coefficient for the interaction term remains significantly negative implying that foreign competition affects economic growth through an indirect channel, by interacting with the distance to the technological frontier. This indicates that trade freedom has a negative impact on growth, especially for leader economies, which is consistent with Schumpeter's idea of monopoly as a necessary reward for innovation. Again, all standard control variables are significant and have the expected signs.

Finally, column 4 in table 3 depicts the regression results when MENA countries are controlled for. Both the MENA dummy and the interaction term between trade freedom and the MENA dummy are insignificant; implying that the impact of trade freedom on economic growth applies to all countries including the MENA ones. The coefficient of trade freedom is insignificant, while the interaction term remains significantly negative, and emphasizes that distance to the frontier plays a major role in shaping the impact of foreign competition on economic growth. The technological gap is also positive and significant, and the standard control variables are all significant.

4. Conclusion and Policy Recommendations

In this paper, we tried to revisit the puzzling relationship between competition and economic growth, focusing on how the country's distance to the technological frontier can influence the impact of competition on growth. In doing so, we present a brief review of the theoretical and empirical literature in this regard. Then the study employs panel data estimation for a sample of 115 countries all over the world during the period 1995-2010, to analyse the impact of competition on economic growth while considering the role of the technological gap in the growth process, and controlling for the MENA countries in the sample. Within this framework, business freedom and trade freedom indices have been used as proxies for two different types of competitive pressures. In particular, business freedom was used to proxy

for domestic competition due to the entry or the activity of other firms in the market, and trade freedom was employed to proxy foreign competition through the threat of entry of foreign firms or products to domestic market.

The results of the study show that severe domestic competition tends to hamper the growth rate of an economy independent of the country's technological gap. This provides evidence in support of the basic Schumpeterian idea that competition hinders dynamic efficiency and discourages investment in R&D, whereas monopoly is more favourable to innovation and growth since it allows monopolists to charge higher prices for their products and thus cash in on their innovations more quickly than smaller firms. Nonetheless, the effect of domestic competition on growth is almost negligible in the MENA countries, which shows that the static efficiency gain tends to offset dynamic efficiency loss resulting from more competition.

On the other hand, the relationship between foreign competition and growth depends on the technological gap between the observed country and the technological leader. In particular, the results show that trade freedom has a negative impact on growth, especially for technological leader economies, while countries with larger technological gaps have a higher potential to benefit from foreign competition. Accordingly, laggard economies require regulations regarding foreign entry which allow them to have better access to advanced foreign technologies and help them enhance their catching-up process, yet protect their domestic firms from severe foreign competition that would decrease their expected payoff from innovating. Such impact of trade freedom on growth applies to all countries including MENA countries.

In light of the above analysis, it could be concluded that the need for competition policy is indispensible, yet to be effective, competition policy design requires careful assessment of existing conditions in the country and particular attention to the implementation process. It is advised that countries with low levels of technological advancements should focus more on adopting policies to attract foreign direct investments which enable them to have access to advanced technologies and thus promote their technological progress. Protection of property rights, promotion of rule of law and transparency, enhancing labour skills, and achieving political and economic stability are all believed to be among the main factors that would enhance the investment climate and hence induce growth in those countries. On the other hand, more advanced economies require adopting policies aiming at promoting innovation and guaranteeing sufficient rewards for innovating firms. This might endorse the granting of

exemptions to investments in R&D under competition law. Such exemptions could be activity and time-limited in a way that allows innovating firms to cooperate in certain R&D activities and acquire rewarding profits on their innovations for a limited time, then ultimately increases consumer welfare by offering new products at lower prices.

It is worth mentioning that although the business freedom and trade freedom indices employed in the underlying analysis have the advantage of covering a large number of countries for a significant time series, allowing for the long run analysis of the economy-wide effect of competition on growth, the score of business freedom index is mainly determined on the basis of a qualitative judgment, making it a subjective indicator with some limitations. This calls for a need for future attempts to search for more objective quantitative measures that capture the economy-wide level of competition in a comparable manner allowing for conducting cross-country studies.

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Appendix

Table 1: Descriptive Statistics

Variable	Obs.	Mean	Std. Dev.	Min	Max
GDP Growth Rate	3096	4.116	5.794	-41.3	106.28
Business Freedom (t-1)	2337	63.563	15.313	0	100
Trade Freedom (t-1)	2337	65.324	16.697	0	90
Technological Gap (t-1)	1815	0.3245	0 .2625	0.0097	1
B.Freedom (t-1)*Tech.Gap (t-1)	1733	24.165	22.234	0.359	93.2
T.Freedom (t-1)*Tech.Gap (t-1)	1733	24.522	21.829	0	86.9
Population Growth Rate	3415	1.487	1.5915	-10.965	17.4832
Trade Openness	2890	88.361	49.470	0.309	444.1
Inflation Rate	2698	14.21	105.71	-16.117	4145.11
Investment	2770	22.931	8.498	-2.424	113.58
Gov. Consumption Expenditure	2751	15.958	6.305	2.047	69.543
MENA Dummy	3424	0.1122	0.3156	0	1
B.Freedom (t-1)*MENA Dummy	2337	9.068	23.246	0	100
T.Freedom (t-1)*MENA Dummy	2337	8.682	22.624	0	90

Table 2: Effects of Business Freedom and Technological Gap on GDP Growth Rate

GDP Growth Rate	(1)	(2)	(3)	(4)
Business Freedom (t-1)	-0.0530826*** (0.0113151)	-0.0482694*** (0.0171668)	-0.0477049*** (0.0166466)	-0.0601387*** (0.0175696)
Technological Gap (t-1)	-2.381547*** (0.8373179)	-1.307931 (2.995725)	0.5964482 (2.832021)	0.3198158 (2.872326)
B.Free (t-1)*Tech.Gap (t-1)		-0.0150231 (0.0402875)	-0.0287616 (0.0376174)	-0.019918 (0.0383455)
Pop. Growth Rate			0.209643** (0.0872424)	0.1927152** (0.0923422)
Trade Openness			0.0145166*** (0.0034418)	0.0142009*** (0.0034063)
Inflation Rate			-0.0092273*** (0.0019623)	-0.0093608*** (0.0019599)
Investment			0.1928349*** (0.0185997)	0.1948462*** (0.0185758)
Gov. Consumption Expenditure			-0.1352132*** (0.0314871)	-0.1421608*** (0.0316703)
Dummy for MENA Countries				-3.443743* (1.961531)
B.Free (t-1)*Dum MENA				0.0565308** (0.0281174)
Constant	8.506736*** (0.6833192)	8.199925*** (1.06891)	4.170744*** (1.193013)	4.928562*** (1.24288)
Obs.	**1708**	**1708**	**1573**	**1573**
Countries	**120**	**120**	**115**	**115**
R^2 (overall)	**0.067**	**0.067**	**0.213**	**0.217**

Notes: - Standard errors in parentheses.

- The symbols ***, **, * indicate a significance level of 1%, 5% and 10% respectively.
- Models estimated are Random Effect panel data models.

Table 3: Effects of Trade Freedom and Technological Gap on GDP Growth Rate

GDP Growth Rate	(1)	(2)	(3)	(4)
Trade Freedom (t-1)	-0.0006969*** (0.0094297)	0.0369343*** (0.012894)	0.0013049 (0.0129989)	-0.0029053 (0.0133531)
Technological Gap (t-1)	-4.346976*** (0.8087465)	11.52702*** (3.820168)	8.229163** (3.662463)	9.71547** (3.824935)
T.Free (t-1)*Tech.Gap (t-1)		-0.206693*** (0.0485535)	-0.1415188*** (0.0463402)	-0.159265*** (0.0482722)
Pop. Growth Rate			0.200556** (0.0909524)	0.1890621* (0.0973045)
Trade Openness			0.0162605*** (0.0037104)	0.0165384*** (0.0037346)
Inflation Rate			-0.008715*** (0.0019714)	-0.0087189*** (0.001972)
Investment			0.1918969*** (0.0192616)	0.1923457*** (0.0192868)
Gov. Consumption Expenditure			-0.1600145*** (0.0326237)	-0.1604574*** (0.0330719)
Dummy for MENA Countries				-2.301697 (1.562163)
T.Free (t-1)*Dum MENA				0.0338356 (0.0222751)
Constant	5.689028*** (0.6282493)	2.987682*** (0.8927847)	1.44723 (1.040777)	1.694522 (1.061021)
Obs.	**1708**	**1708**	**1573**	**1573**
Countries	**120**	**120**	**115**	**115**
R^2 (overall)	**0.052**	**0.054**	**0.195**	**0.197**

Notes: - Standard errors in parentheses.

- The symbols ***, **, * indicate a significance level of 1%, 5% and 10% respectively.
- Models estimated are Random Effect panel data models.