



รายงานวิจัยฉบับสมบูรณ์

โครงการ หลักฐานเชิงประจักษ์ของความเชื่อมโยงระหว่างนโยบายด้านการแข่งขันทางการค้าและการลงทุน
Empirical Evidence on the Link between Competition Policy and Investment

โดย

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The relationship between competition policy and investment is empirically examined. Empirical findings suggest that increasing market competition has a positive and robust impact on the share of total investment in GDP per capita. Developing countries enjoy benefits from competition legislation efficiency improvement, whereas the reduction of government anti-competitive price control intervention enhances the good investment environment in developed countries. In relation to the potential impacts of ASEAN competition policies, if ASEAN-4 countries (Indonesia, Malaysia, Philippines, and Thailand) become as competitive as Singapore, the investment shares are expected to increase to approximately 2 to 4 percent. Further, foreign direct investment inflows from the 30 OECD countries are expected to increase roughly 0.6 to 1.2 percent.

งานวิจัยชิ้นนี้เป็นการศึกษาถึงความสัมพันธ์ในเชิงประจักษ์ระหว่างนโยบายด้านการแข่งขันทางการค้าและการลงทุน ผลการศึกษาที่ได้พบว่า การแข่งขันทางการค้าที่เพิ่มขึ้นจะส่งผลกระทบในเชิงบวกอย่างแข็งแกร่งต่อสัดส่วนมูลค่าการลงทุนรวมต่อรายได้ต่อหัวประชากร โดยประเทศที่กำลังพัฒนา จะได้รับประโยชน์ในแง่ของการลงทุนรวมที่เพิ่มขึ้นจากการปรับปรุงกฎหมายทางการแข่งขันทางการค้าให้มีประสิทธิภาพยิ่งขึ้น สำหรับประเทศที่พัฒนาแล้ว จะได้รับประโยชน์จากการลดมาตรการแทรกแซงราคาจากภาครัฐ สำหรับการประเมินผลกระทบต่อกลุ่มประเทศอาเซียนสี่ประเทศ ได้แก่ ประเทศอินโดนีเซีย มาเลเซีย ฟิลิปปินส์ และไทย ที่หากมีระดับการแข่งขันทางการค้าเท่าเทียมกับประเทศสิงคโปร์ ผลการศึกษาที่ได้ชี้ว่า สัดส่วนมูลค่าการลงทุนรวมต่อผลผลิตมวลรวมประชาชาติในกลุ่มประเทศนี้จะเพิ่มขึ้นจากเดิมประมาณ 2 ถึง 4 เปอร์เซ็นต์ ยิ่งไปกว่านั้น มูลค่าการลงทุนทางตรงจากต่างประเทศที่มาจาก 30 ประเทศสมาชิก OECD จะเพิ่มสูงขึ้นประมาณ 0.6 ถึง 1.2 เปอร์เซ็นต์

Keywords: Competition policy, Investment, Gravity Model

(คำหลัก) นโยบายด้านการแข่งขันทางการค้า การลงทุน แบบจำลองแรงดึงดูด

Executive Summary (บทสรุปผู้บริหาร)

ในช่วงทศวรรษที่ผ่านมา ได้เกิดปรากฏการณ์ทางด้านเศรษฐกิจระหว่างประเทศที่ไม่เคยปรากฏมาก่อนคือการเกิดขึ้นของการจัดตั้งเขตการค้าเสรีในระดับต่างๆ เป็นจำนวนมาก โดยเฉพาะอย่างยิ่งในระดับทวิภาคี และการเกิดขึ้นของการรวมกลุ่มเศรษฐกิจระหว่างประเทศต่างๆ เช่น สหภาพยุโรป เป็นต้น สำหรับประเทศในภูมิภาคเอเชียตะวันออกเฉียงใต้หรือกลุ่มประเทศสมาชิกอาเซียนก็เช่นเดียวกัน ต่างเห็นถึงความสำคัญและความจำเป็นในการจัดตั้งประชาคมเศรษฐกิจอาเซียน (ASEAN Economic Community) โดยในการประชุมสุดยอดอาเซียน เมื่อปี ค.ศ. 2003 ประเทศสมาชิกอาเซียนได้มีความเห็นชอบร่วมกันในการจัดตั้งประชาคมเศรษฐกิจอาเซียนให้เกิดขึ้นภายในปี ค.ศ. 2020 ซึ่งในเวลาต่อมา เมื่อปี ค.ศ. 2007 ประเทศสมาชิกอาเซียน ได้มีความเห็นชอบในการเร่งการรวมตัวเป็นประชาคมเศรษฐกิจอาเซียนให้เร็วขึ้นจากที่กำหนดไว้เดิม มาเป็นภายในปี ค.ศ. 2015 สำนักเลขาธิการอาเซียนได้จัดทำพิมพ์เขียวประชาคมเศรษฐกิจอาเซียน (AEC Blueprint) ซึ่งได้รับการลงนามจากประเทศสมาชิกอาเซียนในปี ค.ศ. 2007 เพื่อใช้เป็นแผนในการดำเนินงานเพื่อให้บรรลุเป้าหมายของการจัดตั้งประชาคมเศรษฐกิจอาเซียน โดย 1 ใน 4 ยุทธศาสตร์หลักในพิมพ์เขียวประชาคมเศรษฐกิจอาเซียนได้กำหนดให้ การสร้างขีดความสามารถในการแข่งขันทางเศรษฐกิจของอาเซียน (Highly competitive economic region) เป็นยุทธศาสตร์หลักในการจัดตั้งประชาคมเศรษฐกิจอาเซียน ซึ่งนโยบายที่สำคัญภายใต้ยุทธศาสตร์ในการสร้างขีดความสามารถในการแข่งขันที่ถูกระบุไว้คือนโยบายด้านการแข่งขันทางการค้า ที่มีเป้าหมายในการส่งเสริมให้เกิดสถาบันหรือกฎหมายในการดูแลให้การแข่งขันทางการค้ามีความเป็นธรรมยิ่งขึ้น

แม้ว่านโยบายด้านการแข่งขันทางการค้าจะเป็นนโยบายสำคัญสำหรับการจัดตั้งประชาคมเศรษฐกิจอาเซียน แต่ในปัจจุบันกลับยังไม่มีงานศึกษาใดที่ได้ศึกษาถึงผลกระทบต่อประเทศสมาชิกอาเซียนที่จะเกิดขึ้นจากการดำเนินนโยบายดังกล่าว โดยเฉพาะอย่างยิ่งการประเมินผลกระทบที่จะเกิดขึ้นต่อประเทศไทย ซึ่งในทางทฤษฎีแล้วผลกระทบของการแข่งขันทางการค้ากับการพัฒนาเศรษฐกิจในระดับมหภาคยังมีทิศทางไม่ชัดเจนนัก ทั้งนี้แม้ว่าการแข่งขันทางการค้าจะช่วยเพิ่มประสิทธิภาพทางเศรษฐกิจ และเอื้อบรรยากาศการลงทุนให้ดีขึ้น แต่ในเวลาเดียวกันการเพิ่มขึ้นของการแข่งขันทางการค้าอาจลดโอกาสของการลงทุนจากผู้ผลิตที่มีอำนาจในตลาดอยู่เดิม ดังนั้นด้วยความสัมพันธ์ที่ไม่ชัดเจนในทางทฤษฎีระหว่างการแข่งขันทางการค้าและการลงทุนเช่นนี้ จึงทำให้การศึกษาเชิงประจักษ์มีความสำคัญเป็นอย่างมาก

งานวิจัยชิ้นนี้จึงได้ศึกษาในเชิงประจักษ์ถึงความเชื่อมโยงระหว่างนโยบายด้านการแข่งขันทางการค้ากับการลงทุน ผลการศึกษาพบว่า ความสัมพันธ์ระหว่างตัวชี้วัดทางการแข่งขันทางการค้ากับสัดส่วนการลงทุนรวมต่อรายได้ต่อหัวประชากรมีทิศทางที่ไปด้วยกันอย่างแข็งแกร่ง ดังนั้นการปรับปรุงทางการแข่งขันทางการค้า ซึ่งเสริมสร้างบรรยากาศของการลงทุนในประเทศให้ดีขึ้น จึงเป็นสิ่งที่นักวางแผนนโยบายของแต่ละประเทศควรให้ความสำคัญ แต่ทั้งนี้ตัวชี้วัดถึงนโยบายด้านการแข่งขันทางการค้าที่พบว่ามีความสัมพันธ์กับการลงทุนมีความแตกต่างกันระหว่างประเทศที่กำลังพัฒนาและที่พัฒนาแล้ว โดยประเทศที่กำลังพัฒนาจะได้รับประโยชน์ในแง่ของการ

ลงทุนรวมที่เพิ่มขึ้น จากการปรับปรุงกฎหมายทางการแข่งขันทางการค้าให้มีประสิทธิภาพยิ่งขึ้น ในขณะที่ประเทศที่พัฒนาแล้ว จะได้รับประโยชน์จากการลดมาตรการแทรกแซงราคาจากรัฐ

แม้ว่านโยบายด้านการแข่งขันทางการค้าที่ถูกเสนอแนะจากงานศึกษาชิ้นนี้ จะอยู่นอกเหนือแผนการดำเนินงานที่ถูกระบุไว้ในพิมพ์เขียวประชาคมเศรษฐกิจอาเซียนในปัจจุบัน แต่อาจเป็นนโยบายที่กลุ่มประเทศสมาชิกอาเซียนควรให้ความสำคัญและดำเนินต่อไปในอนาคต ในส่วนของความร่วมมือทางด้านนโยบายด้านการแข่งขันทางการค้าในภูมิภาค ผลการศึกษาที่ได้ชี้ว่า หากประเทศอาเซียนสี่ประเทศ ได้แก่ ประเทศอินโดนีเซีย มาเลเซีย ฟิลิปปินส์ และไทยมีระดับการแข่งขันทางการค้าเท่ากับประเทศสิงคโปร์ ซึ่งเป็นประเทศที่มีระดับการแข่งขันทางการค้าสูงสุดในภูมิภาค สัดส่วนมูลค่าการลงทุนรวมต่อผลผลิตมวลรวมประชาชาติจะเพิ่มขึ้นประมาณ 2 ถึง 4 เปอร์เซ็นต์ ยิ่งไปกว่านั้น มูลค่าการลงทุนทางตรงจากต่างประเทศที่มาจาก 30 ประเทศสมาชิก OECD จะเพิ่มสูงขึ้นประมาณ 0.6 ถึง 1.2 เปอร์เซ็นต์

1. Introduction

The world has experienced a tremendous rise in unprecedented economic integration, as noted by a large number of bilateral Free Trade Agreements (FTAs), as well as other forms of economic cooperation (such as regional cooperation in investments and industrial linkages) over the last two decades. In the context of South-East Asian regional economic integration, the Association of Southeast Asian Nations (ASEAN) member countries agreed in October 2003 to establish an ASEAN Economic Community (AEC) by 2020. This timeline has recently been changed to 2015. In order to advance the AEC, ASEAN member countries have agreed to implement the AEC Blueprint, in which one of key elements specified is a highly competitive economic region policy¹.

Although competition policy is a crucial element in economic development, there have not been many studies on this subject. Whether increasing market competition promotes economic development and creates a good investment environment is still an open question. High competition, together with good enforcement, is believed to stimulate economic and technological efficiency, which in turn attracts new investment in an economy (Evenett, 2005). In contrast, high competition may reduce the tendency of dominant firms to innovate and invest more if monopoly profits are used to finance innovative activities (Blundell et al., 1995). Despite this ambiguous theoretical relationship, existing empirical studies on the effects of cross-country competition policy

¹ See ASEAN Secretariat (2008).

are scarce and quite restricted. As suggested by Dutz and Hayri (2000), empirical studies have failed to capture economy-wide effects. Although they investigated the partial correlation of an economy-wide competition variable, specifically in growth models, there are plenty of areas in need of further examination.

The objectives of this study are to investigate empirically whether high competition is robustly correlated with high investment and to assess the potential impact of ASEAN competition policy on investment. The methodology employed is straightforward. An investment model is drawn from the work of Levine and Renelt (1992) and Sudsawasd and Moore (2006), where the model is extended to include a set of competition policy measures. Seven measures related to competition policy are selected according to a broad definition of competition policy. Since a relationship between competition policy and investment in developed and developing economies can be significantly different, this study estimates the impact of completion policy on investment and performs a robustness test in order to identify relevant robust competition policy in the context of both developed and developing countries.

After the areas of competition policy that should be emphasized are identified, the potential impacts of ASEAN competition regional policies on the share of total investment in GDP per capita are calculated by considering the case in which all ASEAN countries are becoming as competitive as Singapore, the most competitive country in the region. In addition, a gravity model of bilateral Foreign Direct Investment (FDI) flows is applied to evaluate the effects on the FDI inflows from the 30 OECD countries. The findings will provide useful information for policymakers and other stakeholders in terms of choosing appropriate policies for each individual ASEAN member country.

2. Methodology

A variant of the Levine and Renelt (1992) and Sudsawasd and Moore (2006) frameworks is employed in this study. Levine and Renelt (1992) used cross-sectional data to investigate the empirical links between various macroeconomic indicators and investment. They employed Leamer's (1983) Extreme-Bound Analysis (EBA) approach to perform a robustness test, in which a robust relationship between investment and international trade was found. In a subsequent study by Sudsawasd and Moore (2006), the Levine and Renelt (1992) dataset was expanded to a panel dataset. They found a robust correlation between investment and trade policy volatility. For this study, the focus is on the relationship between investment and competition policy. The model is in the following general form:

$$Y = \beta_X X + \beta_M M + \beta_Z Z + \varepsilon ,$$

where Y is the dependent variable, X is the set of variables always included, M is a set of policy variables of interest, Z is a set of optional variables that have been identified previously as potential important explanatory variables, β is the estimated coefficient, and ε is the error term.

The Y -variable is the share of total investment, including both domestic and foreign investment, in GDP per capita (INV). Further, the M -variables are the competition policy measures (COM). For the X -variables, as suggested by Levine and Renelt (1992), the share of total trade in GDP per capita (X) is identified as one of the X -variables. However, since the level of development of a country may influence the level of

investment through increases in domestic savings and capital inflows, GDP per capita (*GDPPC*) is additionally included.

The *Z*-variables are similar to those employed by Sudsawasd and Moore (2006), including the share of government expenditures in GDP per capita (*GOV*), inflation rate (*INFL*), growth rate of domestic credit (*GDC*), standard deviation of inflation (*STINFL*), and standard deviation of domestic credit growth (*STGDC*). Since the set of included *Z*-variables is generally unknown, EBA analysis will provide the extreme upper and lower bounds for the estimated parameters of interest (β_M).

Applying the EBA approach, the model is first estimated without the *Z*-variables. This regression is referred to as the base equation. Next, regressions estimate all possible combinations of the *Z*-variables in order to identify the upper and lower bounds². The extreme upper (lower) bound is identified by the highest (lowest) estimated coefficient of the variables of interest, β_M , plus (minus) two standard deviations. If the estimated parameters remain significant and have the same sign within both bounds, the EBA results suggest a “robust” relationship; otherwise, the relationship is considered to be “fragile.”

3. Competition policy measures

There is no consensus on a definition for competition policy. Developing countries may view competition policy differently from those of developed countries, as competition policy has often met more resistance in developing countries. Evenett (2005) provides basic arguments of such resistance. For instance, a larger firm size may be

² Using the set of five *Z*-variables, 31 alternative combinations can be identified for each *M* variable.

necessary to compete in a global market, market power may enhance innovation, and too much rivalry may lead to inefficiencies in natural monopolies and some network industries.

In general, competition policy is regarded as a government policy used to constrain “anti-competitive acts,” such as abuse of a dominant position and merger practices to foster economic efficiency. However, there has been some work completed on the scope of “anti-competitive acts.” Hoekman and Mavroidis (2002) define competition policy as “the set of rules and disciplines maintained by governments aiming to counteract attempts to monopolize the market, either through agreements between firms that restrict competition or through unilateral behavior.” Their definition places emphasis on firm behavior.

On the other hand, under the European Competition Commissioner, a definition of competition policy constrains both private and public anti-competitive practices, such as public authorities and state-owned enterprises. As pointed out by the European Competition Commissioner spokesperson³, “Competition policy is basically applying rules to make sure that companies compete with each other and, in order to sell their products, innovate and offer good prices to consumers.” Additionally, in the consolidated versions of the treaty with the European Union and the treaty of the functioning of the European Union (Notice no. 2008/C 115/01), the European competition policy, or the rules on competition, is officially stated to prohibit all agreements which may have as their object or effect the prevention, restriction, or distortion of competition. In particular,

³ Excerpt from http://ec.europa.eu/comm/competition/consumers/index_en.html (accessed on Sep 17, 2008).

focus is placed on four areas: anti-competitive practices such as cartels, horizontal agreements and vertical agreements, abuse of a dominant position such as a monopoly, concentration between undertakings such as mergers, acquisitions, and joint ventures, and any country's aid or subsidy.

Currently, only four ASEAN member countries, namely Indonesia, Singapore, Thailand, and Vietnam, have their own competition laws⁴. There is no official regional ASEAN competition law yet; but there are plans stated in the AEC Blueprint to introduce competition policy to all ASEAN member countries by 2015 and to develop regional guidelines on competition policy by 2010. Although the objectives of the existing ASEAN competition laws are similar to those of the European Union, there are large differences in governing law provisions. For instance, all ASEAN member countries have some exemptions for public authorities and state-owned enterprises⁵. Even with the same competition laws, the effectiveness of the implementation could vary substantially across countries. Dutz and Vagliasindi (2000) classify the implementation criteria into three categories: enforcement, competition advocacy, and institutional effectiveness. Given all of these criteria, it is unlikely that a perfect indicator measuring the effectiveness of competition policy implementation in each country can be found. Therefore, this study identifies competition policy measures according to a broad definition of competition policy. Seven alternative competition policy indicators are selected from the IMD's

⁴ Although the Philippines and Malaysia do not have competition laws, they do have some law provisions to ensure competition.

⁵ For a recent review of ASEAN competition laws, see Pupphavesa et al. (2009).

*World Competitiveness Yearbook*⁶. All include qualitative data based on the executive opinion survey.

The first two indicators, *Legal and regulatory* and *Protectionism*, are based on the survey questions: “Does the legal and regulatory framework encourage the competitiveness of enterprises?” and “Does not protectionism impair the conduct of your business?” These two questions intend to capture the quality of the legal and regulatory framework, as well as overall protectionism in the market. Though the *Protectionism* measure is not all about competition policy, it is directed more at general economic governance. However, under a broad definition of competition policy, which is the set of rules aiming to restrain competition, it may be appropriate to use the *Protectionism* indicator as a measure of a competitive environment to a certain extent.

Public sector contracts and *Foreign investors* indicators are response to the following questions: “Are public sector contracts sufficiently open to foreign bidders?” and “Are foreign investors free to acquire control in domestic companies?” These indicators attempt to reflect public anti-competitive restrictions on foreign investors and the ease with which foreign firms can access markets. Next, a *Competition legislation* indicator is based on the question: “Is competition legislation efficient in preventing unfair competition?” The establishment of competition legislation alone may not well indicate the level of enforcement. For instance, Thailand’s experience illustrates that, although competition law has been voluntarily enacted, the implementation of such law is already problematic and has not been properly enforced in the absence of political

⁶ The IMD’s *World Competitiveness Yearbook* has the most comprehensive global data on competitiveness, in which it collects data based on hard data collection and an executive opinion survey.

interest (Nikomborirak, 2006). Thus, this indicator provides superior information to hard evidence, such as when competition law was first enacted. Finally, *Subsidies* and *Price controls* indicators are response to the questions: “Do not subsidies distort fair competition and economic development?” and “Do not price controls affect pricing of products in most industries?” These questions aim to assess the degree of government anti-competitive interventions in the markets.

It is noteworthy that high marks on these seven indicators would, at best, indicate only a partially high degree of competition, since all of these indicators have inevitable shortcomings. For instance, the response from a monopoly firm may give high marks to all of these indicators, despite the fact that the market is completely dominated. As a result, high marks may fail to reflect high competition intensity. Hence, estimation findings should be interpreted with great caution.

4. Data and empirical issues

Unbalanced panel data from 50 countries over the period 1996 to 2004 were drawn from four data sets⁷: the World Bank’s *World Development Indicators*, the IMF’s *International Financial Statistics*, the *Penn World Table* 6.1, and the IMD’s *World Competitiveness Yearbook*⁸. Since the dataset is panel data, the Hausman (1978) specification test was employed to examine whether a fixed effect or random effect model specification was appropriate. The Hausman test rejected the null hypothesis, in

⁷ The list of 50 countries is presented in the Appendix.

⁸ Data sources for all variables are reported in the Appendix. Note that, in this study, the choice of countries and time periods is determined by data availability.

which the estimated coefficients between the two estimators were statistically indifferent. Hence, the fixed effects model was selected as the main estimator for further analysis⁹. Both the one-way and two-way fixed effects models were estimated, and the estimation results were similar. Thus, only estimation results from the one-way fixed effects model are reported and discussed.

Since there is a potential endogeneity problem in the model, the endogeneity test based on the Durbin–Wu–Hausman test was performed¹⁰. By regressing potential endogenous explanatory variables on all other exogenous variables, the residuals were obtained. The residual variable was then added to the original equation to test for the significance. The findings indicated that the coefficient on the residual variable was statistically insignificant. Hence, the endogeneity problem was not likely to be severe in this model specification.

The modified Durbin-Watson test (Bhargava et al., 1982) and the Baltagi-Wu (1999) locally best invariant (LBI) test for first order serial correlation were employed. Both tests rejected the null hypothesis of no first order serial correlation for each of the estimated equations. Next, the White test for the presence of heteroskedasticity was performed. The White test rejected the null hypothesis of homoskedasticity. Since evidence of both serial correlation and heteroskedasticity was found, this study applied a fixed effects model with the robust covariance matrix estimator¹¹.

⁹ Estimation results from the random effects model estimator are available from the author upon request.

¹⁰ For additional information on the Durbin-Wu-Hausman endogeneity test, see Davidson and MacKinnon (1993).

¹¹ For additional information on the models with robust covariance matrix used, known as the cluster-correlated robust estimator, see Roger (1993) and Williams (2000).

5. Robustness results

Table 1 presents the estimation results for the effects of competition policy on total investment share in GDP per capita when all of the *Z*-variables were included and when data for all countries were pooled. The results are summarized as follows:

Regarding the relationship between each of the *X*-variables and the investment share, trade share in GDP per capita was found to be statistically insignificant at the 0.05 significance level for most model specifications. With one exception, when a *Subsidies* indicator was entered as the policy variable of interest, the coefficient of the trade share variable was significant and positively correlated with the investment share. This finding signifies the importance of the set of explanatory variables included on the sign and significance level of the estimated coefficients. Next, the coefficient on GDP per capita was positive, but insignificant. This result was consistent with the Levine and Renelt's (1992) findings for a non-robust relationship between per capita income and investment. It suggested that the level of development of a country has no significant influence on investment, as expected through increases in domestic savings and capital inflows.

The findings on the estimated coefficients of *Z*-variables indicated that the government share in the GDP per capita coefficient was negative and significant. Hence, a partial government crowding-out effect on the investment share was suggested. In terms of the inflation rate variable, in the model specification with the *Subsidies* measure included, countries with a higher inflation rate were significantly associated with less investment share. However, the inflation rate coefficient was insignificant in other model specifications. Next, the estimated coefficient of the standard deviation of inflation was

positive and significant. In addition, a country with a higher growth rate of domestic credit was found to be more attractive for investment, whereas a higher standard deviation of domestic credit growth was associated with less investment share.

Countries with higher competition levels measured in the three indicators, namely, *Legal and regulatory*, *Competition legislation*, and *Price controls*, resulted in increases in investment share. These empirical results indicated that countries with higher market competition tend to have a larger ratio of total investment to GDP per capita. However, as Levine and Renelt (1992) points out, the estimated coefficients may depend importantly on the conditioning set of information used. The list of a particular variable of interest that is significantly correlated with a dependent variable may alter when the conditioning set of explanatory variables in the regression changes. Hence, in order to improve confidence in the findings, a robustness test based on the EBA was performed. The results are presented in Tables 2 to 4.

The findings of the EBA tests were quite interesting and confirmed the robust correlations between various competition policy indicators and investment shares. When the pooling data of all countries were used, three of seven competition policy indicators (namely, *Legal and regulatory*, *Competition legislation*, and *Price controls*) were robustly correlated with the investment share, where all had a positive correlation (Table 2). The findings strengthened the important role that competition policy has on investment. However, the list of robust competition policy measures was shortened when smaller datasets were used. First, when the dataset was restricted to developing countries, only the *Competition legislation* indicator was found to be robustly correlated with the

investment share¹² (Table 3). Whereas, when the developed country dataset was used, only the estimated coefficient of the *Price controls* measure was robust with respect to the investment (Table 4). Note that the findings supported the hypothesis, which indicated that the relationship between investment and competition policy may differ significantly between developed and developing countries.

Nonetheless, the findings narrowed the scope of the relevant competition policies for a closer look from policymakers. For instance, policymakers in developing countries should focus on how to make their competition legislation more efficient; and policymakers in developed countries should concentrate on how to reduce the degree of government anti-competitive intervention, specifically price controls behavior. It is worth mentioning that this shortened list of the robust indicators perhaps reflects a problem associated with the minimal amount of data used, which increased the size of standard errors, making the estimated coefficients insignificant.

6. ASEAN competition policy assessments

6.1 Effects on total investment

The recent ASEAN-5 data for each competition policy indicator are presented in Table 5¹³. For all of the seven policy indicators, Singapore was ranked as the most competitive country in the region; on the other hand, many other ASEAN-5 countries (Indonesia, Malaysia, Philippines, and Thailand), named later as ASEAN-4, were ranked

¹² Developing countries and developed countries are identified according to the World Bank's definition. See www.worldbank.org/depweb/english/beyond/global/glossary.html.

¹³ ASEAN-5 countries are Indonesia, Malaysia, the Philippines, Singapore, and Thailand.

lower. There were large variations, as measured by standard deviation, in the existing competition policy indicators within ASEAN, especially with the *Legal and regulatory* indicator¹⁴. These large variations may be part of the obstacles related to the success of ASEAN competition policy frameworks. Although there are other factors (i.e., domestic support) that might have contributed to the success, they are outside the current scope of this study.

In order to evaluate the impacts of strengthening ASEAN competition policies, this study considers the case in which all ASEAN countries are assumed to become as competitive as Singapore, the most competitive country in the region. Since ASEAN-4 countries are identified as developing countries, the estimated coefficients from the “base” regressions using the panel of a developing country dataset were used. Only the robust competition policy indicator was analyzed. A summary of the estimated impacts is presented in Table 6.

The estimations indicate that ASEAN-4 countries will enjoy strong benefits from increasing market competition in terms of growth of total investment share. With the improvement of *Competition legislation*, the investment share in ASEAN-4 is expected to increase from 2.03% (Malaysia) to 4.02% (Philippines). Hence, this finding strongly supports the role of competition policy as the key to enhancing a good investment environment in the region. It should be noted that the estimations were based on partial correlations and on the assumptions made, such that all ASEAN countries are as

¹⁴ The large variation in the *Legal and regulatory* indicator was identified by a large standard deviation from the regional average. This deviation was almost double the other policy indicators’ standard deviations.

competitive as the most competitive country in the region, an extremely difficult prospect given the existing large regional policy variations. Therefore, the actual impacts could be much smaller.

6.2 Effects on FDI

From the early section of this paper, the effects of ASEAN completion policies on total investment share were found to be substantially large. However, the increase in total investment was perhaps not only due to the change in domestic investment, but also reflected the change in foreign investment. In this section, the focus is on foreign direct investment, in which the applied gravity model is developed to capture the potential effects of competition policy on FDI inflows to ASEAN member countries.

The gravity model is widely known and has been extensively used as a framework for analyzing the patterns of bilateral trade and investment flows between countries¹⁵. The model basically assumes that factor determinants of bilateral FDI flows are based on distance and mass variables. For the mass variable, the gross domestic products (*GDP*) for both FDI source (*i*) and host (*j*) countries are commonly used to measure the economic sizes of the FDI partners, as larger countries tend to send and receive more FDI flows. Per capita income (*GDPPC*) is generally included to measure labor costs, levels of development, as well as returns to capital. As noted by Kreinin and Plummer (2008), the estimated coefficient on this variable can be subjected to multiple interpretations. The

¹⁵ For instance, Kreinin and Plummer (2008) used a gravity model to estimate the effect of regional economic integration on FDI flows. Sudsawasd and Mongsawad (2007) applied the model to estimate trade potentials for ASEAN-5.

geographic distance (*DIST*) and the dummy of common language (*COMLANG*) between source country *i* and host country *j* are included to measure transportation and communication costs between them. And, finally, the competition policy (*COM*) of a host country *j* is added to the basic specification for the purpose of this investigation.

The data of FDI flows were drawn mainly from the OECD. This data source provides the disaggregated bilateral FDI outflows from 30 OECD source countries over the period 1985-2007¹⁶. Since the focus is on the effects of ASEAN competition policy, the scope of FDI recipients is restricted to ASEAN-5 countries, plus the additional five countries that have close cooperation with ASEAN; namely, Australia, China, India, Japan, and Korea.

The estimation results of the gravity model are presented in Table 7. As expected, the estimated coefficients of the GDP variables were positive and significant. This result indicated that the sizes of both FDI source and host countries were relevant to the level of FDI flows. The estimated coefficient on per capita GDP of the FDI source countries was found to be negative. The geographic distance between the source and host countries had a negative impact, and the effect of communication cost was not significant.

With reference to the effects of competition policy on FDI flows, the estimated coefficients of most competition policy indicators were positive and significant (except *Foreign investors* and *Price controls*, which were positive but not significant). In general, the finding confirmed that increasing market competition had strong positive effects on total investment share partly through increasing foreign investment.

¹⁶ See www.sourceoecd.org (accessed on Oct. 16, 2009.) The list of the 30 OECD source countries is shown in the Appendix.

The estimated impacts of ASEAN competition policies on FDI inflows are presented in Table 8. As in the previous section, the estimations were based on the assumption that all ASEAN countries will become as competitive as Singapore. Since only ASEAN-5 data were available and all other ASEAN countries besides Singapore were identified as developing countries, the *Competition legislation* indicator, the only robust competition policy indicator in the developing country dataset, was analyzed. The estimations based on the estimated coefficient from the gravity model indicated that foreign direct investment inflows from the 30 OECD countries to ASEAN-4 countries will increase from 0.63% (Malaysia) to 1.24% (Philippines).

7. Concluding remarks

This paper revealed positive and robust correlations between various competition policy indicators and the share in total investment in GDP per capita. The finding suggests that increasing competition intensity might be one of interest to policymakers as a way to create a good investment environment. Developing and developed countries were found to benefit from strengthening competition in terms of growth in total investment share, where the areas of competition policy were narrowed to competition legislation efficiency improvement for developing countries and to less government anti-competitive price control intervention for developed countries; both were found to jeopardize the investment share. Although the suggested areas of competition policy are beyond the current scope of ASEAN economic cooperation, as specified in the AEC Blueprint, they are still consistent with the AEC goals: to increase regional economic

efficiency and to remove barriers to cross-regional economic integration. These areas might be worth pursuing in the near future.

As stated, there are large variations in existing competition policies within the ASEAN region. These large policy variations may be a major obstacle to the success of ASEAN competition policy. However, the formation of the regional competition policy is tempting. If ASEAN-4 countries can improve their competitiveness such that each rises to the same level as that found in Singapore, the most competitive country in the region, the share of total investment in GDP per capita in these countries is expected to increase to around 2 to 4 percent. Additionally, the FDI inflows from the 30 OECD countries are expected to increase approximately 0.63 to 1.24 percent.

Table 1. Panel Regression Results for All countries (Dependent variable: Total investment share in GDP per capita)

<i>COM variable</i>	<i>Legal and regulatory (COM1)</i>	<i>Protectionism (COM2)</i>	<i>Public sector contracts (COM3)</i>	<i>Foreign investors (COM4)</i>	<i>Competition legislation (COM5)</i>	<i>Subsidies (COM6)</i>	<i>Price controls (COM7)</i>
<i>X</i>	-0.0818 * (0.0431)	-0.0731 (0.0458)	-0.0735 (0.0443)	-0.0757 * (0.0446)	-0.0775 * (0.0433)	0.0820 ** (0.0328)	-0.0768 * (0.0421)
<i>RGDPPC</i>	0.0009 * (0.0005)	0.0007 (0.0005)	0.0007 (0.0005)	0.0007 (0.0005)	0.0007 (0.0004)	-0.0004 (0.0006)	0.0007 (0.0004)
<i>GOV</i>	-0.4312 ** (0.2022)	-0.4056 * (0.2103)	-0.4178 ** (0.2065)	-0.4052 * (0.2077)	-0.4114 ** (0.2025)	0.2581 (0.4381)	-0.3777 * (0.2128)
<i>INF</i>	-0.0148 (0.0305)	0.0231 (0.0457)	0.0342 (0.0422)	0.0288 (0.0405)	0.0416 (0.0410)	-0.1571 *** (0.0439)	0.0003 (0.0316)
<i>GDC</i>	0.0037 (0.0030)	0.0048 (0.0029)	0.0054 * (0.0028)	0.0051 * (0.0028)	0.0051 * (0.0029)	0.0686 ** (0.0311)	0.0053 * (0.0028)
<i>STINF</i>	0.0801 * (0.0419)	0.1221 ** (0.0546)	0.1390 *** (0.0473)	0.1298 *** (0.0450)	0.1485 *** (0.0382)		0.0664 (0.0449)
<i>STGDC</i>	-0.0037 (0.0030)	-0.0048 (0.0029)	-0.0054 * (0.0028)	-0.0051 * (0.0028)	-0.0051 * (0.0029)	0.0320 (0.0279)	-0.0053 * (0.0028)
<i>COM</i>	0.7202 *** (0.1975)	0.2744 (0.2675)	0.1683 (0.2878)	0.3473 (0.3351)	0.5418 ** (0.2356)	-0.3630 (0.2973)	0.6822 ** (0.3096)
Intercept	13.8483 * (7.7774)	16.2642 ** (7.1499)	17.1309 ** (7.0317)	15.4207 ** (7.4656)	15.0833 ** (7.1456)	12.0845 (14.0724)	15.3753 ** (7.1869)
No. obs.	249	250	250	250	250	83	250
Groups	46	46	46	46	46	46	46
R-squared	0.2771	0.1743	0.1434	0.1526	0.1364	0.0763	0.2135

Note: ***, **, * denote 1%, 5%, 10% levels of significance, respectively. Figures in parentheses are robust standard errors.

Table 2. Sensitivity Analysis Results for All Countries (Dependent variable: Total investment share in GDP per capita)

COM Variable		Coefficient	S.E.	Obs.	Groups	R ²	Z-variables	EBA test
<i>Legal and regulatory (COM1)</i>	High:	0.8947 ***	0.1976	249	36	0.2706	INF,STGDC	Robust
	Base:	0.5848 **	0.2438	278	50	0.2206		
	Low:	0.6324 ***	0.1978	278	50	0.2225	GOV	
<i>Protectionism (COM2)</i>	High:	0.6707 ***	0.2102	267	48	0.1408	INF	Fragile
	Base:	0.6369 **	0.2378	279	50	0.1825		
	Low:	0.2744	0.2675	250	46	0.1743	GOV,INF,GDC,STINF,STGDC	
<i>Public sector contracts (COM3)</i>	High:	0.5419 *	0.2841	267	48	0.0765	INF	Fragile
	Base:	0.4542	0.3299	279	50	0.1183		
	Low:	0.1486	0.3187	250	46	0.0656	INF,STINF,STGDC	
<i>Foreign investors (COM4)</i>	High:	0.8892 ***	0.3071	250	46	0.1774	STGDC	Fragile
	Base:	0.5310	0.3747	279	50	0.1224		
	Low:	0.3261	0.3246	267	48	0.1067	GOV,INF,STINF	
<i>Competition legislation (COM5)</i>	High:	0.7617 **	0.2996	250	46	0.1376	GDC	Robust
	Base:	0.7617 **	0.2996	279	50	0.0989		
	Low:	0.5402 **	0.2370	250	46	0.1492	GOV,GDC,STINF,STGDC	
<i>Subsidies (COM6)</i>	High:	0.2107	0.3720	83	46	0.3397	GOV,STGDC	Fragile
	Base:	-0.0503	0.3334	91	50	0.2118		
	Low:	-0.4866	0.3404	87	48	0.0227	GOV,INF,STINF	
<i>Price controls (COM7)</i>	High:	0.9884 ***	0.2117	250	46	0.2169	STGDC	Robust
	Base:	0.9963 ***	0.2092	279	50	0.1919		
	Low:	0.6822 **	0.3096	250	46	0.2135	GOV,INF,GDC,STINF,STGDC	

Note: ***, **, * denote 1%, 5%, 10% levels of significance, respectively.

Table 3. Sensitivity Analysis Results for Developing Countries (Dependent variable: Total investment share in GDP per capita)

COM Variable		Coefficient	S.E.	Obs.	Groups	R ²	Z-variables	EBA test
<i>Legal and regulatory (COM1)</i>	High:	1.0746 ***	0.1881	107	21	0.0548	GOV,INF,GDC	Fragile
	Base:	0.5775 *	0.3337	119	23	0.0971		
	Low:	0.5492 *	0.2929	107	21	0.3262	STGDC	
<i>Protectionism (COM2)</i>	High:	0.9353 ***	0.1901	113	22	0.2125	INF	Fragile
	Base:	0.8444 ***	0.2182	119	23	0.1312		
	Low:	0.5229 *	0.2725	107	21	0.0851	STINF,STGDC	
<i>Public sector contracts (COM3)</i>	High:	0.7504 *	0.3808	107	21	0.0811	GDC	Fragile
	Base:	0.6714 *	0.3646	119	23	0.1068		
	Low:	0.2593	0.3781	107	21	0.0582	STINF,STGDC	
<i>Foreign investors (COM4)</i>	High:	0.8740 **	0.3638	107	21	0.0348	GDC	Fragile
	Base:	0.3979	0.4769	119	23	0.0566		
	Low:	0.1592	0.3434	107	21	0.0360	STINF,STGDC	
<i>Competition legislation (COM5)</i>	High:	1.0089 ***	0.2893	119	23	0.0046	GOV	Robust
	Base:	1.0638 **	0.4857	119	23	0.1013		
	Low:	0.7981 **	0.3807	107	21	0.3611	INF,GDC,STGDC	
<i>Subsidies (COM6)</i>	High:	0.0325	0.7986	39	23	0.0669	GOV,STINF,STGDC	Fragile
	Base:	-0.0677	0.6301	39	23	0.0862		
	Low:	-1.6248 **	0.6102	37	22	0.0449	GOV,INF,STINF	
<i>Price controls (COM7)</i>	High:	0.6896 ***	0.1360	107	21	0.0047	GDC	Fragile
	Base:	0.6203 ***	0.1517	119	23	0.0828		
	Low:	0.3180	0.1994	107	21	0.0391	STINF,STGDC	

Note: ***, **, * denote 1%, 5%, 10% levels of significance, respectively

Table 4. Sensitivity Analysis Results for Developed Countries (Dependent variable: Total investment share in GDP per capita)

COM Variable		Coefficient		S.E.	Obs.	Groups	R ²	Z-variables	EBA test
<i>Legal and regulatory (COM1)</i>	High:	0.7530	**	0.2844	142	25	0.0029	INF,STGDC	Fragile
	Base:	0.6419	**	0.2795	159	27	0.0067		
	Low:	0.2156		0.1707	142	35	0.0159	INF,GDC,STINF,STGDC	
<i>Protectionism (COM2)</i>	High:	0.2806		0.3123	143	25	0.0003	STGDC	Fragile
	Base:	0.1625		0.2867	160	27	0.0018		
	Low:	-0.1494		0.3588	143	25	0.0132	GOV,INF,GDC,STINF,STGDC	
<i>Public sector contracts (COM3)</i>	High:	0.9588		0.6242	154	26	0.0751	STINF	Fragile
	Base:	0.2311		0.6053	160	27	0.0031		
	Low:	0.1416		0.5756	160	27	0.0048	GOV	
<i>Foreign investors (COM4)</i>	High:	1.1392		0.7447	143	25	0.0019	STGDC	Fragile
	Base:	0.9346		0.6526	160	27	0.0004		
	Low:	0.4197		0.5793	154	26	0.0733	GOV,INF,STINF	
<i>Competition legislation (COM5)</i>	High:	0.4282		0.3444	154	26	0.0375	STINF	Fragile
	Base:	0.3647		0.3159	160	27	0.0043		
	Low:	0.2894		0.3664	143	25	0.0115	INF,GDC,STINF,STGDC	
<i>Subsidies (COM6)</i>	High:	0.4014		0.3909	48	25	0.0036	GOV,GDC	Fragile
	Base:	0.0669		0.4011	52	27	0.0028		
	Low:	-0.1122		0.3649	50	26	0.0322	GOV,INF,STINF	
<i>Price controls (COM7)</i>	High:	2.1482	***	0.5962	143	25	0.0083	INF,GDC	Robust
	Base:	1.9549	***	0.6011	160	27	0.0447		
	Low:	1.5873	***	0.4841	154	26	0.1404	GOV,INF,STINF	

Note: ***, **, * denote 1%, 5%, 10% levels of significance, respectively.

Table 5. Competition Policy Indicators: Indonesia, Malaysia, the Philippines, Singapore, and Thailand

<i>Competition policy indicator\Country</i>	<i>Indonesia</i>		<i>Malaysia</i>		<i>Philippines</i>		<i>Singapore</i>		<i>Thailand</i>		<i>Mean</i>	<i>S.D.</i>
<i>Legal and regulatory (COM1)</i>	4.29	(25)	5.35	(16)	3.28	(42)	8.65	(1)	3.78	(34)	5.07	2.14
<i>Protectionism (COM2)</i>	4.91	(39)	5.28	(35)	3.70	(51)	7.42	(6)	5.45	(33)	5.35	1.34
<i>Public sector contracts (COM3)</i>	5.30	(35)	4.54	(47)	5.29	(36)	8.23	(1)	6.05	(27)	5.88	1.42
<i>Foreign investors (COM4)</i>	6.30	(40)	4.64	(52)	5.18	(50)	8.63	(10)	5.33	(48)	6.02	1.58
<i>Competition legislation (COM5)</i>	4.85	(37)	5.42	(31)	3.55	(51)	7.33	(2)	4.44	(41)	5.12	1.41
<i>Subsidies (COM6)</i>	4.00	(48)	5.02	(31)	4.27	(43)	7.07	(4)	5.25	(25)	5.12	1.20
<i>Price controls (COM7)</i>	5.59	(43)	5.55	(44)	4.90	(49)	7.85	(9)	4.82	(50)	5.74	1.23

Note: Countries' rank orders are in parentheses. The data are 2008 data.

Source: IMD's *World Competitiveness Yearbook* 2008.

Table 6. Summary of Estimated impacts of ASEAN competition policies on total investment share in GDP per capita

Indicator\Country	Indonesia	Malaysia	Philippines	Thailand
	(% change)	(% change)	(% change)	(% change)
<i>Competition legislation</i>				
Base:	2.64	2.03	4.02	3.07

Note: Only robust policy indicators are evaluated. The study considers the case in which the selected ASEAN countries are as competitive as Singapore

Table 7. Gravity Model Regression Results (Dependent variable: $\ln(FDI)_{ij}$)

<i>COM variable</i>	<i>Legal and regulatory (COM1)</i>		<i>Protectionism (COM2)</i>		<i>Public sector contracts (COM3)</i>		<i>Foreign investors (COM4)</i>		<i>Competition legislation (COM5)</i>		<i>Subsidies (COM6)</i>		<i>Price controls (COM7)</i>	
$\ln(GDP_j)$	0.0073	***	0.0086	***	0.0099	***	0.0069	***	0.0067	***	0.0099	***	0.0059	***
	(0.0015)		(0.0015)		(0.0016)		(0.0014)		(0.0013)		(0.0021)		(0.0016)	
$\ln(GDP_i)$	0.2159	**	0.1453	**	0.1370	*	0.1451	**	0.1353	*	0.2799		0.1443	
	(0.0884)		(0.0714)		(0.0713)		(0.0716)		(0.0717)		(0.2228)		(0.1089)	
$\ln(GDPPC_j)$	0.0046	***	0.0036	***	0.0046	***	0.0051	***	0.0040	**	0.0040	*	0.0070	***
	(0.0014)		(0.0013)		(0.0012)		(0.0014)		(0.0016)		(0.0023)		(0.0016)	
$\ln(GDPPC_i)$	-0.2110	**	-0.1334	*	-0.1278	*	-0.1348	*	-0.1253	*	-0.2812		-0.1400	
	(0.0933)		(0.0755)		(0.0754)		(0.0756)		(0.0758)		(0.2377)		(0.1142)	
$\ln(DIST_{ij})$	-0.0154	**	-0.0117	**	-0.0136	**	-0.0096	*	-0.0098	*	-0.0315	***	-0.0212	***
	(0.0060)		(0.0055)		(0.0056)		(0.0055)		(0.0055)		(0.0082)		(0.0067)	
$COMLANG_{ij}$	0.0010		0.0069		0.0032		0.0101		0.0090		-0.0044		0.0043	
	(0.0082)		(0.0076)		(0.0077)		(0.0076)		(0.0077)		(0.0113)		(0.0094)	
COM_j	0.0039	***	0.0055	***	0.0059	***	0.0016		0.0033	*	0.0100	***	0.0015	
	(0.0011)		(0.0016)		(0.0014)		(0.0016)		(0.0020)		(0.0033)		(0.0021)	
Intercept	6.2443	***	6.2438	***	6.4066	***	6.2998	***	6.5023	***	5.6263	**	7.3112	***
	(1.1056)		(1.3532)		(1.3513)		(1.3563)		(1.3582)		(2.6661)		(1.3218)	
No. obs.	2293		2605		2605		2605		2605		1200		1979	
Groups	29		29		29		29		29		29		29	
R-squared	0.2416		0.2529		0.2546		0.2500		0.2505		0.3301		0.2468	

Note: ***, **, * denote 1%, 5%, 10% levels of significance, respectively. Figures in parentheses are robust standard errors.

Table 8. Summary of Estimated impacts of ASEAN competition policies on FDI inflows

Indicator\Country	Indonesia	Malaysia	Philippines	Thailand
	(% change)	(% change)	(% change)	(% change)
<i>Competition legislation</i>	0.82	0.63	1.24	0.95

Note: Only robust policy indicators are evaluated. The study considers the case in which the selected ASEAN countries are as competitive as Singapore

Data Appendix

List of 50 countries

Argentina, Australia, Austria, Belgium, Brazil, Canada, Chile, China P.R. Mainland, China P.R. Hong Kong, Colombia, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, India, Indonesia, Ireland, Israel, Italy, Japan, Jordan, Korea, Luxembourg, Malaysia, Mexico, Netherlands, Norway, Philippines, Poland, Portugal, Romania, Russia, Singapore, Slovak Republic, Slovenia, South Africa, Spain, Sweden, Switzerland, Taiwan, Thailand, Turkey, United Kingdom, United States, Venezuela Rep. Bol.

List of 30 OECD (FDI source) countries

Australia, Austria, Belgium, Canada, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Japan, Korea, Luxembourg, Mexico, Netherlands, New Zealand, Norway, Poland, Portugal, Slovak Republic, Spain, Sweden, Switzerland, Turkey, United Kingdom, United States.

Variable and Source

<i>Variable</i>	<i>Definition and sources</i>
<i>COM1</i>	'Legal and regulatory'. (Source: <i>World Competitiveness Yearbook</i> , 2008.)
<i>COM2</i>	'Protectionism'. (Source: <i>World Competitiveness Yearbook</i> , 2008.)
<i>COM3</i>	'Public sector contracts'. (Source: <i>World Competitiveness Yearbook</i> , 2008.)
<i>COM4</i>	'Foreign investors'. (Source: <i>World Competitiveness Yearbook</i> , 2008.)
<i>COM5</i>	'Competition legislation'. (Source: <i>World Competitiveness Yearbook</i> , 2008.)
<i>COM6</i>	'Subsidies'. (Source: <i>World Competitiveness Yearbook</i> , 2008.)
<i>COM7</i>	'Price controls'. (Source: <i>World Competitiveness Yearbook</i> , 2008.)
<i>COMLANG</i>	Dummy variable = 1 if the two countries share the same language = 0 otherwise. (Source: <i>CEPII's database</i>)

<i>DIST</i>	Distance between countries <i>i</i> and <i>j</i> . (Source: <i>CEPII's</i> database)
<i>FDI</i>	Foreign direct investment at the constant price. (Source: SourceOECD's database).
<i>GDC</i>	Growth rate of (net) domestic credit at the constant price. (Source: <i>World Development Indicators (WDI)</i> , 2008.)
<i>GDP</i>	GDP at the constant price. (Source: <i>World Development Indicators (WDI)</i> , 2008.)
<i>GDPPC</i>	GDP per capita at the constant price. (Source: <i>World Development Indicators (WDI)</i> , 2008.)
<i>GOV</i>	Government share of real GDP per capita at the constant price. (Source: <i>Penn World Table (PWT)</i> 6.1.)
<i>INFL</i>	Inflation. (Source: <i>International Financial Statistics</i> , 2008.)
<i>INV</i>	Investment share of real GDP per capita at the constant price. (Source: <i>Penn World Table (PWT)</i> 6.1.)
<i>RGDPPC</i>	Real GDP per capita at the constant price. (Source: <i>Penn World Table (PWT)</i> 6.1.)
<i>STGDC</i>	Standard deviation of <i>GDC</i> . Calculated by using the square root of the squared residual of an estimation of <i>GDC</i> regressed on a constant term and time trend.
<i>STINFL</i>	Standard deviation of <i>INFL</i> . Calculated by using the square root of the squared residual of an estimation of <i>INFL</i> regressed on a constant term and time trend.
<i>X</i>	Trade share, total trade as % of GDP per capita at the constant price. (Source: <i>Penn World Table (PWT)</i> 6.1.)

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ภาคผนวก



An empirical assessment of the relationship between competition policy and investment

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ABSTRACT

The relationship between competition policy and investment is empirically examined. Empirical findings suggest that increasing market competition has a positive and robust impact on the share of total investment in GDP per capita. Developing countries enjoy benefits from competition legislation efficiency improvement, whereas the reduction of government anti-competitive price control intervention enhances the good investment environment in developed countries. In relation to the potential impacts of ASEAN competition policies, if ASEAN-4 countries (Indonesia, Malaysia, Philippines, and Thailand) become as competitive as Singapore, the investment shares are expected to increase to approximately 2–4%. Further, foreign direct investment inflows from the 30 OECD countries are expected to increase roughly 0.6–1.2%.

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1. Introduction

The world has experienced a tremendous rise in unprecedented economic integration, as noted by a large number of bilateral Free Trade Agreements (FTAs), as well as other forms of economic cooperation (such as regional cooperation in investments and industrial linkages) over the last two decades. In the context of Southeast Asian regional economic integration, the Association of Southeast Asian Nations (ASEAN) member countries agreed in October 2003 to establish an ASEAN Economic Community (AEC) by 2020. This timeline has recently been changed to 2015. In order to advance the AEC, ASEAN member countries have agreed to implement the AEC Blueprint, in which one of key elements specified is a highly competitive economic region policy.¹

Although competition policy is a crucial element in economic development, there have not been many studies on this subject. Whether increasing market competition promotes economic development and creates a good investment environment is still an open question. High competition, together with good enforcement, is believed to stimulate economic and technological efficiency, which in turn attracts new investment in an economy (Evenett, 2005). In contrast, high competition may reduce the tendency of dominant firms to innovate and invest more if monopoly profits are used to finance innovative activities (Blundell, Griffith, & Reenen, 1995). Despite this ambiguous theoretical relationship, existing empirical studies on the effects of cross-country competition policy are scarce and quite restricted. As suggested by Dutz and Hayri (2000), empirical studies have failed to capture economy-wide effects. Although they investigated the partial correlation of an economy-wide competition variable, specifically in growth models, there are plenty of areas in need of further examination.

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¹ See ASEAN Secretariat (2008).

The objectives of this study are to investigate empirically whether high competition is robustly correlated with high investment and to assess the potential impact of ASEAN competition policy on investment. The methodology employed is straightforward. An investment model is drawn from the work of Levine and Renelt (1992) and Sudsawasd and Moore (2006), where the model is extended to include a set of competition policy measures. Seven measures related to competition policy are selected according to a broad definition of competition policy. Since a relationship between competition policy and investment in developed and developing economies can be significantly different, this study estimates the impact of completion policy on investment and performs a robustness test in order to identify relevant robust competition policy in the context of both developed and developing countries.

After the areas of competition policy that should be emphasized are identified, the potential impacts of ASEAN competition regional policies on the share of total investment in GDP per capita are calculated by considering the case in which all ASEAN countries are becoming as competitive as Singapore, the most competitive country in the region. In addition, a gravity model of bilateral foreign direct investment (FDI) flows is applied to evaluate the effects on the FDI inflows from the 30 OECD countries. The findings will provide useful information for policymakers and other stakeholders in terms of choosing appropriate policies for each individual ASEAN member country.

2. Methodology

A variant of the Levine and Renelt (1992) and Sudsawasd and Moore (2006) frameworks is employed in this study. Levine and Renelt (1992) used cross-sectional data to investigate the empirical links between various macroeconomic indicators and investment. They employed Leamer's (1983) Extreme-Bound Analysis (EBA) approach to perform a robustness test, in which a robust relationship between investment and international trade was found. In a subsequent study by Sudsawasd and Moore (2006), the Levine and Renelt (1992) dataset was expanded to a panel dataset. They found a robust correlation between investment and trade policy volatility. For this study, the focus is on the relationship between investment and competition policy. The model is in the following general form:

$$Y = \beta_X X + \beta_M M + \beta_Z Z + \varepsilon,$$

where Y is the dependent variable, X is the set of variables always included, M is a set of policy variables of interest, Z is a set of optional variables that have been identified previously as potential important explanatory variables, β is the estimated coefficient, and ε is the error term.

The Y -variable is the share of total investment, including both domestic and foreign investment, in GDP per capita (INV). Further, the M -variables are the competition policy measures (COM). For the X -variables, as suggested by Levine and Renelt (1992), the share of total trade in GDP per capita (X) is identified as one of the X -variables. However, since the level of development of a country may influence the level of investment through increases in domestic savings and capital inflows, GDP per capita (GDPPC) is additionally included.

The Z -variables are similar to those employed by Sudsawasd and Moore (2006), including the share of government expenditures in GDP per capita (GOV), inflation rate (INFL), growth rate of domestic credit (GDC), standard deviation of inflation (STINFL), and standard deviation of domestic credit growth (STGDC). Since the set of included Z -variables is generally unknown, EBA analysis will provide the extreme upper and lower bounds for the estimated parameters of interest (β_M).

Applying the EBA approach, the model is first estimated without the Z -variables. This regression is referred to as the base equation. Next, regressions estimate all possible combinations of the Z -variables in order to identify the upper and lower bounds.² The extreme upper (lower) bound is identified by the highest (lowest) estimated coefficient of the variables of interest, β_M , plus (minus) two standard deviations. If the estimated parameters remain significant and have the same sign within both bounds, the EBA results suggest a “robust” relationship; otherwise, the relationship is considered to be “fragile.”

3. Competition policy measures

There is no consensus on a definition for competition policy. Developing countries may view competition policy differently from those of developed countries, as competition policy has often met more resistance in developing countries. Evenett (2005) provides basic arguments of such resistance. For instance, a larger firm size may be necessary to compete in a global market, market power may enhance innovation, and too much rivalry may lead to inefficiencies in natural monopolies and some network industries.

In general, competition policy is regarded as a government policy used to constrain “anti-competitive acts,” such as abuse of a dominant position and merger practices to foster economic efficiency. However, there has been some work completed on the scope of “anti-competitive acts.” Hoekman and Mavroidis (2002) define competition policy as “the set of rules and disciplines maintained by governments aiming to counteract attempts to monopolize the market, either through agreements between firms that restrict competition or through unilateral behavior.” Their definition places emphasis on firm behavior.

² Using the set of five Z -variables, 31 alternative combinations can be identified for each M variable.

On the other hand, under the European Competition Commissioner, a definition of competition policy constrains both private and public anti-competitive practices, such as public authorities and state-owned enterprises. As pointed out by the European Competition Commissioner spokesperson,³ “Competition policy is basically applying rules to make sure that companies compete with each other and, in order to sell their products, innovate and offer good prices to consumers.” Additionally, in the consolidated versions of the treaty with the European Union and the treaty of the functioning of the European Union (Notice no. 2008/C 115/01), the European competition policy, or the rules on competition, is officially stated to prohibit all agreements which may have as their object or effect the prevention, restriction, or distortion of competition. In particular, focus is placed on four areas: anti-competitive practices such as cartels, horizontal agreements and vertical agreements, abuse of a dominant position such as a monopoly, concentration between undertakings such as mergers, acquisitions, and joint ventures, and any country’s aid or subsidy.

Currently, only four ASEAN member countries, namely Indonesia, Singapore, Thailand, and Vietnam, have their own competition laws.⁴ There is no official regional ASEAN competition law yet; but there are plans stated in the AEC Blueprint to introduce competition policy to all ASEAN member countries by 2015 and to develop regional guidelines on competition policy by 2010. Although the objectives of the existing ASEAN competition laws are similar to those of the European Union, there are large differences in governing law provisions. For instance, all ASEAN member countries have some exemptions for public authorities and state-owned enterprises.⁵ Even with the same competition laws, the effectiveness of the implementation could vary substantially across countries. Dutz and Vagliasindi (2000) classify the implementation criteria into three categories: enforcement, competition advocacy, and institutional effectiveness. Given all of these criteria, it is unlikely that a perfect indicator measuring the effectiveness of competition policy implementation in each country can be found. Therefore, this study identifies competition policy measures according to a broad definition of competition policy. Seven alternative competition policy indicators are selected from the IMD’s *World Competitiveness Yearbook*.⁶ All include qualitative data based on the executive opinion survey.

The first two indicators, *Legal and regulatory* and *Protectionism*, are based on the survey questions: “Does the legal and regulatory framework encourage the competitiveness of enterprises?” and “Does not protectionism impair the conduct of your business?” These two questions intend to capture the quality of the legal and regulatory framework, as well as overall protectionism in the market. Though the *Protectionism* measure is not all about competition policy, it is directed more at general economic governance. However, under a broad definition of competition policy, which is the set of rules aiming to restrain competition, it may be appropriate to use the *Protectionism* indicator as a measure of a competitive environment to a certain extent.

Public sector contracts and *Foreign investors* indicators are response to the following questions: “Are public sector contracts sufficiently open to foreign bidders?” and “Are foreign investors free to acquire control in domestic companies?” These indicators attempt to reflect public anti-competitive restrictions on foreign investors and the ease with which foreign firms can access markets. Next, a *Competition legislation* indicator is based on the question: “Is competition legislation efficient in preventing unfair competition?” The establishment of competition legislation alone may not well indicate the level of enforcement. For instance, Thailand’s experience illustrates that, although competition law has been voluntarily enacted, the implementation of such law is already problematic and has not been properly enforced in the absence of political interest (Nikomborirak, 2006). Thus, this indicator provides superior information to hard evidence, such as when competition law was first enacted. Finally, *Subsidies* and *Price controls* indicators are response to the questions: “Do not subsidies distort fair competition and economic development?” and “Do not price controls affect pricing of products in most industries?” These questions aim to assess the degree of government anti-competitive interventions in the markets.

It is noteworthy that high marks on these seven indicators would, at best, indicate only a partially high degree of competition, since all of these indicators have inevitable shortcomings. For instance, the response from a monopoly firm may give high marks to all of these indicators, despite the fact that the market is completely dominated. As a result, high marks may fail to reflect high competition intensity. Hence, estimation findings should be interpreted with great caution.

4. Data and empirical issues

Unbalanced panel data from 50 countries over the period 1996–2004 were drawn from four data sets⁷: the World Bank’s *World Development Indicators*, the IMF’s *International Financial Statistics*, the Penn World Table 6.1, and the IMD’s *World Competitiveness Yearbook*.⁸ Since the dataset is panel data, the Hausman (1978) specification test was employed to examine whether a fixed effect or random effect model specification was appropriate. The Hausman test rejected the null hypothesis, in which the estimated coefficients between the two estimators were statistically indifferent. Hence, the fixed effects model

³ Excerpt from http://ec.europa.eu/comm/competition/consumers/index_en.html (accessed on September 17, 2008).

⁴ Although the Philippines and Malaysia do not have competition laws, they do have some law provisions to ensure competition.

⁵ For a recent review of ASEAN competition laws, see Pupphavesa, Chairisawatsuk, Sudsawasd, Ongkittikul, and Chintakananda (2009).

⁶ The IMD’s *World Competitiveness Yearbook* has the most comprehensive global data on competitiveness, in which it collects data based on hard data collection and an executive opinion survey.

⁷ The list of 50 countries is presented in Appendix A.

⁸ Data sources for all variables are reported in Appendix A. Note that, in this study, the choice of countries and time periods is determined by data availability.

Table 1

Panel regression results for all countries (dependent variable: total investment share in GDP per capita).

COM variable	Legal and regulatory (COM1)	Protectionism (COM2)	Public sector contracts (COM3)	Foreign investors (COM4)	Competition legislation (COM5)	Subsidies (COM6)	Price controls (COM7)
X	−0.0818 [*] (0.0431)	−0.0731 (0.0458)	−0.0735 (0.0443)	−0.0757 [*] (0.0446)	−0.0775 [*] (0.0433)	0.0820 ^{**} (0.0328)	−0.0768 [*] (0.0421)
RGDPPC	0.0009 [*] (0.0005)	0.0007 (0.0005)	0.0007 (0.0005)	0.0007 (0.0005)	0.0007 (0.0004)	−0.0004 (0.0006)	0.0007 (0.0004)
GOV	−0.4312 ^{**} (0.2022)	−0.4056 [*] (0.2103)	−0.4178 ^{**} (0.2065)	−0.4052 [*] (0.2077)	−0.4114 ^{**} (0.2025)	0.2581 (0.4381)	−0.3777 [*] (0.2128)
INF	−0.0148 (0.0305)	0.0231 (0.0457)	0.0342 (0.0422)	0.0288 (0.0405)	0.0416 (0.0410)	−0.1571 ^{***} (0.0439)	0.0003 (0.0316)
GDC	0.0037 (0.0030)	0.0048 (0.0029)	0.0054 [*] (0.0028)	0.0051 [*] (0.0028)	0.0051 [*] (0.0029)	0.0686 ^{**} (0.0311)	0.0053 [*] (0.0028)
STINF	0.0801 [*] (0.0419)	0.1221 ^{**} (0.0546)	0.1390 ^{***} (0.0473)	0.1298 ^{***} (0.0450)	0.1485 ^{***} (0.0382)		0.0664 (0.0449)
STGDC	−0.0037 (0.0030)	−0.0048 (0.0029)	−0.0054 [*] (0.0028)	−0.0051 [*] (0.0028)	−0.0051 [*] (0.0029)	0.0320 (0.0279)	−0.0053 [*] (0.0028)
COM	0.7202 ^{***} (0.1975)	0.2744 (0.2675)	0.1683 (0.2878)	0.3473 (0.3351)	0.5418 [*] (0.2356)	−0.3630 (0.2973)	0.6822 ^{**} (0.3096)
Intercept	13.8483 [*] (7.7774)	16.2642 ^{**} (7.1499)	17.1309 ^{**} (7.0317)	15.4207 ^{**} (7.4656)	15.0833 ^{**} (7.1456)	12.0845 (14.0724)	15.3753 ^{**} (7.1869)
No. obs.	249	250	250	250	250	83	250
Groups	46	46	46	46	46	46	46
R-squared	0.2771	0.1743	0.1434	0.1526	0.1364	0.0763	0.2135

Note: Figures in parentheses are robust standard errors.

^{*} 10% levels of significance.^{**} 5% levels of significance.^{***} 1% level of significance.

was selected as the main estimator for further analysis.⁹ Both the one-way and two-way fixed effects models were estimated, and the estimation results were similar. Thus, only estimation results from the one-way fixed effects model are reported and discussed.

Since there is a potential endogeneity problem in the model, the endogeneity test based on the Durbin–Wu–Hausman test was performed.¹⁰ By regressing potential endogenous explanatory variables on all other exogenous variables, the residuals were obtained. The residual variable was then added to the original equation to test for the significance. The findings indicated that the coefficient on the residual variable was statistically insignificant. Hence, the endogeneity problem was not likely to be severe in this model specification.

The modified Durbin–Watson test (Bhargava, Franzini, & Narendranathan, 1982) and the Baltagi and Wu (1999) locally best invariant (LBI) test for first order serial correlation were employed. Both tests rejected the null hypothesis of no first order serial correlation for each of the estimated equations. Next, the White test for the presence of heteroskedasticity was performed. The White test rejected the null hypothesis of homoskedasticity. Since evidence of both serial correlation and heteroskedasticity was found, this study applied a fixed effects model with the robust covariance matrix estimator.¹¹

5. Robustness results

Table 1 presents the estimation results for the effects of competition policy on total investment share in GDP per capita when all of the Z-variables were included and when data for all countries were pooled. The results are summarized as follows.

Regarding the relationship between each of the X-variables and the investment share, trade share in GDP per capita was found to be statistically insignificant at the 0.05 significance level for most model specifications. With one exception, when a *Subsidies* indicator was entered as the policy variable of interest, the coefficient of the trade share variable was significant and positively correlated with the investment share. This finding signifies the importance of the set of explanatory variables included on the sign and significance level of the estimated coefficients. Next, the coefficient on GDP per capita was positive, but insignificant. This result was consistent with the Levine and Renelt's (1992) findings for a non-robust relationship between per capita income and investment. It suggested that the level of development of a country has no significant influence on investment, as expected through increases in domestic savings and capital inflows.

⁹ Estimation results from the random effects model estimator are available from the author upon request.

¹⁰ For additional information on the Durbin–Wu–Hausman endogeneity test, see Davidson and MacKinnon (1993).

¹¹ For additional information on the models with robust covariance matrix used, known as the cluster-correlated robust estimator, see Rogers (1993) and Williams (2000).

Table 2

Sensitivity analysis results for all countries (dependent variable: total investment share in GDP per capita).

COM variable		Coefficient	S.E.	Obs.	Groups	R ²	Z-variables	EBA test
Legal and regulatory (COM1)	High	0.8947***	0.1976	249	36	0.2706	INF, STGDC	Robust
	Base	0.5848**	0.2438	278	50	0.2206		
	Low	0.6324***	0.1978	278	50	0.2225	GOV	
Protectionism (COM2)	High	0.6707***	0.2102	267	48	0.1408	INF	Fragile
	Base	0.6369**	0.2378	279	50	0.1825		
	Low	0.2744	0.2675	250	46	0.1743	GOV, INF, GDC, STINF, STGDC	
Public sector contracts (COM3)	High	0.5419*	0.2841	267	48	0.0765	INF	Fragile
	Base	0.4542	0.3299	279	50	0.1183		
	Low	0.1486	0.3187	250	46	0.0656	INF, STINF, STGDC	
Foreign investors (COM4)	High	0.8892***	0.3071	250	46	0.1774	STGDC	Fragile
	Base	0.5310	0.3747	279	50	0.1224		
	Low	0.3261	0.3246	267	48	0.1067	GOV, INF, STINF	
Competition legislation (COM5)	High	0.7617**	0.2996	250	46	0.1376	GDC	Robust
	Base	0.7617**	0.2996	279	50	0.0989		
	Low	0.5402**	0.2370	250	46	0.1492	GOV, GDC, STINF, STGDC	
Subsidies (COM6)	High	0.2107	0.3720	83	46	0.3397	GOV, STGDC	Fragile
	Base	−0.0503	0.3334	91	50	0.2118		
	Low	−0.4866	0.3404	87	48	0.0227	GOV, INF, STINF	
Price controls (COM7)	High	0.9884***	0.2117	250	46	0.2169	STGDC	Robust
	Base	0.9963***	0.2092	279	50	0.1919		
	Low	0.6822**	0.3096	250	46	0.2135	GOV, INF, GDC, STINF, STGDC	

* 10% levels of significance.

** 5% levels of significance.

*** 1% level of significance.

The findings on the estimated coefficients of Z-variables indicated that the government share in the GDP per capita coefficient was negative and significant. Hence, a partial government crowding-out effect on the investment share was suggested. In terms of the inflation rate variable, in the model specification with the *Subsidies* measure included, countries with a higher inflation rate were significantly associated with less investment share. However, the inflation rate coefficient was insignificant in other model specifications. Next, the estimated coefficient of the standard deviation of inflation was positive and significant. In addition, a country with a higher growth rate of domestic credit was found to be more attractive for investment, whereas a higher standard deviation of domestic credit growth was associated with less investment share.

Countries with higher competition levels measured in the three indicators, namely, *Legal and regulatory*, *Competition legislation*, and *Price controls*, resulted in increases in investment share. These empirical results indicated that countries with higher market competition tend to have a larger ratio of total investment to GDP per capita. However, as Levine and Renelt (1992) points out, the estimated coefficients may depend importantly on the conditioning set of information used. The list of a particular variable of interest that is significantly correlated with a dependent variable may alter when the conditioning set of explanatory variables in the regression changes. Hence, in order to improve confidence in the findings, a robustness test based on the EBA was performed. The results are presented in Tables 2–4.

The findings of the EBA tests were quite interesting and confirmed the robust correlations between various competition policy indicators and investment shares. When the pooling data of all countries were used, three of seven competition policy indicators (namely, *Legal and regulatory*, *Competition legislation*, and *Price controls*) were robustly correlated with the investment share, where all had a positive correlation (Table 2). The findings strengthened the important role that competition policy has on investment. However, the list of robust competition policy measures was shortened when smaller datasets were used. First, when the dataset was restricted to developing countries, only the *Competition legislation* indicator was found to be robustly correlated with the investment share¹² (Table 3). Whereas, when the developed country dataset was used, only the estimated coefficient of the *Price controls* measure was robust with respect to the investment (Table 4). Note that the findings supported the hypothesis, which indicated that the relationship between investment and competition policy may differ significantly between developed and developing countries.

Nonetheless, the findings narrowed the scope of the relevant competition policies for a closer look from policymakers. For instance, policymakers in developing countries should focus on how to make their competition legislation more efficient; and policymakers in developed countries should concentrate on how to reduce the degree of government anti-competitive

¹² Developing countries and developed countries are identified according to the World Bank's definition. See www.worldbank.org/depweb/english/beyond/global/glossary.html.

Table 3

Sensitivity analysis results for developing countries (dependent variable: total investment share in GDP per capita).

COM Variable		Coefficient	S.E.	Obs.	Groups	R ²	Z-variables	EBA test
Legal and regulatory (COM1)	High	1.0746***	0.1881	107	21	0.0548	GOV, INF, GDC	Fragile
	Base	0.5775*	0.3337	119	23	0.0971		
	Low	0.5492*	0.2929	107	21	0.3262	STGDC	
Protectionism (COM2)	High	0.9353***	0.1901	113	22	0.2125	INF	Fragile
	Base	0.8444***	0.2182	119	23	0.1312		
	Low	0.5229*	0.2725	107	21	0.0851	STINF, STGDC	
Public sector contracts (COM3)	High	0.7504*	0.3808	107	21	0.0811	GDC	Fragile
	Base	0.6714*	0.3646	119	23	0.1068		
	Low	0.2593	0.3781	107	21	0.0582	STINF, STGDC	
Foreign investors (COM4)	High	0.8740**	0.3638	107	21	0.0348	GDC	Fragile
	Base	0.3979	0.4769	119	23	0.0566		
	Low	0.1592	0.3434	107	21	0.0360	STINF, STGDC	
Competition legislation (COM5)	High	1.0089***	0.2893	119	23	0.0046	GOV	Robust
	Base	1.0638**	0.4857	119	23	0.1013		
	Low	0.7981**	0.3807	107	21	0.3611	INF, GDC, STGDC	
Subsidies (COM6)	High	0.0325	0.7986	39	23	0.0669	GOV, STINF, STGDC	Fragile
	Base	−0.0677	0.6301	39	23	0.0862		
	Low	−1.6248**	0.6102	37	22	0.0449	GOV, INF, STINF	
Price controls (COM7)	High	0.6896***	0.1360	107	21	0.0047	GDC	Fragile
	Base	0.6203***	0.1517	119	23	0.0828		
	Low	0.3180	0.1994	107	21	0.0391	STINF, STGDC	

* 10% levels of significance.

** 5% levels of significance.

*** 1% level of significance.

Table 4

Sensitivity analysis results for developed countries (dependent variable: total investment share in GDP per capita).

COM Variable		Coefficient	S.E.	Obs.	Groups	R ²	Z-variables	EBA test
Legal and regulatory (COM1)	High	0.7530**	0.2844	142	25	0.0029	INF, STGDC	Fragile
	Base	0.6419**	0.2795	159	27	0.0067		
	Low	0.2156	0.1707	142	35	0.0159	INF, GDC, STINF, STGDC	
Protectionism (COM2)	High	0.2806	0.3123	143	25	0.0003	STGDC	Fragile
	Base	0.1625	0.2867	160	27	0.0018		
	Low	−0.1494	0.3588	143	25	0.0132	GOV, INF, GDC, STINF, STGDC	
Public sector contracts (COM3)	High	0.9588	0.6242	154	26	0.0751	STINF	Fragile
	Base	0.2311	0.6053	160	27	0.0031		
	Low	0.1416	0.5756	160	27	0.0048	GOV	
Foreign investors (COM4)	High	1.1392	0.7447	143	25	0.0019	STGDC	Fragile
	Base	0.9346	0.6526	160	27	0.0004		
	Low	0.4197	0.5793	154	26	0.0733	GOV, INF, STINF	
Competition legislation (COM5)	High	0.4282	0.3444	154	26	0.0375	STINF	Fragile
	Base	0.3647	0.3159	160	27	0.0043		
	Low	0.2894	0.3664	143	25	0.0115	INF, GDC, STINF, STGDC	
Subsidies (COM6)	High	0.4014	0.3909	48	25	0.0036	GOV, GDC	Fragile
	Base	0.0669	0.4011	52	27	0.0028		
	Low	−0.1122	0.3649	50	26	0.0322	GOV, INF, STINF	
Price controls (COM7)	High	2.1482***	0.5962	143	25	0.0083	INF, GDC	Robust
	Base	1.9549***	0.6011	160	27	0.0447		
	Low	1.5873***	0.4841	154	26	0.1404	GOV, INF, STINF	

* 10% levels of significance.

** 5% levels of significance.

*** 1% level of significance.

Table 5

Competition policy indicators: Indonesia, Malaysia, the Philippines, Singapore, and Thailand.

Competition policy indicator\Country	Indonesia	Malaysia	Philippines	Singapore	Thailand	Mean	S.D.
Legal and regulatory (COM1)	4.29 (25)	5.35 (16)	3.28 (42)	8.65 (1)	3.78 (34)	5.07	2.14
Protectionism (COM2)	4.91 (39)	5.28 (35)	3.70 (51)	7.42 (6)	5.45 (33)	5.35	1.34
Public sector contracts (COM3)	5.30 (35)	4.54 (47)	5.29 (36)	8.23 (1)	6.05 (27)	5.88	1.42
Foreign investors (COM4)	6.30 (40)	4.64 (52)	5.18 (50)	8.63 (10)	5.33 (48)	6.02	1.58
Competition legislation (COM5)	4.85 (37)	5.42 (31)	3.55 (51)	7.33 (2)	4.44 (41)	5.12	1.41
Subsidies (COM6)	4.00 (48)	5.02 (31)	4.27 (43)	7.07 (4)	5.25 (25)	5.12	1.20
Price controls (COM7)	5.59 (43)	5.55 (44)	4.90 (49)	7.85 (9)	4.82 (50)	5.74	1.23

Source: IMD's World Competitiveness Yearbook 2008.

Note: Countries' rank orders are in parentheses. The data are 2008 data.

Table 6

Summary of estimated impacts of ASEAN competition policies on total investment share in GDP per capita.

Indicator	Country			
	Indonesia (% change)	Malaysia (% change)	Philippines (% change)	Thailand (% change)
Competition legislation				
Base	2.64	2.03	4.02	3.07

Note: Only robust policy indicators are evaluated. The study considers the case in which the selected ASEAN countries are as competitive as Singapore.

intervention, specifically price controls behavior. It is worth mentioning that this shortened list of the robust indicators perhaps reflects a problem associated with the minimal amount of data used, which increased the size of standard errors, making the estimated coefficients insignificant.

6. ASEAN competition policy assessments

6.1. Effects on total investment

The recent ASEAN-5 data for each competition policy indicator are presented in Table 5.¹³ For all of the seven policy indicators, Singapore was ranked as the most competitive country in the region; on the other hand, many other ASEAN-5 countries (Indonesia, Malaysia, Philippines, and Thailand), named later as ASEAN-4, were ranked lower. There were large variations, as measured by standard deviation, in the existing competition policy indicators within ASEAN, especially with the *Legal and regulatory* indicator.¹⁴ These large variations may be part of the obstacles related to the success of ASEAN competition policy frameworks. Although there are other factors (i.e., domestic support) that might have contributed to the success, they are outside the current scope of this study.

In order to evaluate the impacts of strengthening ASEAN competition policies, this study considers the case in which all ASEAN countries are assumed to become as competitive as Singapore, the most competitive country in the region. Since ASEAN-4 countries are identified as developing countries, the estimated coefficients from the “base” regressions using the panel of a developing country dataset were used. Only the robust competition policy indicator was analyzed. A summary of the estimated impacts is presented in Table 6.

The estimations indicate that ASEAN-4 countries will enjoy strong benefits from increasing market competition in terms of growth of total investment share. With the improvement of *Competition legislation*, the investment share in ASEAN-4 is expected to increase from 2.03% (Malaysia) to 4.02% (Philippines). Hence, this finding strongly supports the role of competition policy as the key to enhance a good investment environment in the region. It should be noted that the estimations were based on partial correlations and on the assumptions made, such that all ASEAN countries are as competitive as the most competitive country in the region, an extremely difficult prospect given the existing large regional policy variations. Therefore, the actual impacts could be much smaller.

6.2. Effects on FDI

From the early section of this paper, the effects of ASEAN completion policies on total investment share were found to be substantially large. However, the increase in total investment was perhaps not only due to the change in domestic investment, but also reflected the change in foreign investment. In this section, the focus is on foreign direct investment, in which the applied gravity model is developed to capture the potential effects of competition policy on FDI inflows to ASEAN member countries.

¹³ ASEAN-5 countries are Indonesia, Malaysia, the Philippines, Singapore, and Thailand.

¹⁴ The large variation in the *Legal and regulatory* indicator was identified by a large standard deviation from the regional average. This deviation was almost double the other policy indicators' standard deviations.

Table 7

Gravity model regression results (dependent variable: $\ln(\text{FDI}_{ij})$).

COM variable	Legal and regulatory (COM1)	Protectionism (COM2)	Public sector contracts (COM3)	Foreign investors (COM4)	Competition legislation (COM5)	Subsidies (COM6)	Price controls (COM7)
$\ln(\text{GDP}_i)$	0.0073*** (0.0015)	0.0086*** (0.0015)	0.0099*** (0.0016)	0.0069*** (0.0014)	0.0067*** (0.0013)	0.0099*** (0.0021)	0.0059*** (0.0016)
$\ln(\text{GDP}_j)$	0.2159** (0.0884)	0.1453** (0.0714)	0.1370* (0.0713)	0.1451** (0.0716)	0.1353* (0.0717)	0.2799 (0.2228)	0.1443 (0.1089)
$\ln(\text{GDPPC}_i)$	0.0046*** (0.0014)	0.0036*** (0.0013)	0.0046*** (0.0012)	0.0051*** (0.0014)	0.0040*** (0.0016)	0.0040*** (0.0023)	0.0070*** (0.0016)
$\ln(\text{GDPPC}_j)$	−0.2110** (0.0933)	−0.1334* (0.0755)	−0.1278* (0.0754)	−0.1348* (0.0756)	−0.1253* (0.0758)	−0.2812 (0.2377)	−0.1400 (0.1142)
$\ln(\text{DIST}_{ij})$	−0.0154** (0.0060)	−0.0117** (0.0055)	−0.0136** (0.0056)	−0.0096* (0.0055)	−0.0098* (0.0055)	−0.0315*** (0.0082)	−0.0212*** (0.0067)
COMLANG_{ij}	0.0010 (0.0082)	0.0069 (0.0076)	0.0032 (0.0077)	0.0101 (0.0076)	0.0090 (0.0077)	−0.0044 (0.0113)	0.0043 (0.0094)
COM_j	0.0039*** (0.0011)	0.0055*** (0.0016)	0.0059*** (0.0014)	0.0016 (0.0016)	0.0033*** (0.0020)	0.0100*** (0.0033)	0.0015 (0.0021)
Intercept	6.2443*** (1.1056)	6.2438*** (1.3532)	6.4066*** (1.3513)	6.2998*** (1.3563)	6.5023*** (1.3582)	5.6263*** (2.6661)	7.3112*** (1.3218)
No. obs.	2293	2605	2605	2605	2605	1200	1979
Groups	29	29	29	29	29	29	29
R-squared	0.2416	0.2529	0.2546	0.2500	0.2505	0.3301	0.2468

Note: Figures in parentheses are robust standard errors.

* 10% levels of significance.

** 5% levels of significance.

*** 1% level of significance.

Table 8

Summary of estimated impacts of ASEAN competition policies on FDI inflows.

Indicator	Country			
	Indonesia (% change)	Malaysia (% change)	Philippines (% change)	Thailand (% change)
Competition legislation	0.82	0.63	1.24	0.95

Note: Only robust policy indicators are evaluated. The study considers the case in which the selected ASEAN countries are as competitive as Singapore.

The gravity model is widely known and has been extensively used as a framework for analyzing the patterns of bilateral trade and investment flows between countries.¹⁵ The model basically assumes that factor determinants of bilateral FDI flows are based on distance and mass variables. For the mass variable, the gross domestic products (GDP) for both FDI source (i) and host (j) countries are commonly used to measure the economic sizes of the FDI partners, as larger countries tend to send and receive more FDI flows. Per capita income (GDPPC) is generally included to measure labor costs, levels of development, as well as returns to capital. As noted by Kreinin and Plummer (2008), the estimated coefficient on this variable can be subjected to multiple interpretations. The geographic distance (DIST) and the dummy of common language (COMLANG) between source country i and host country j are included to measure transportation and communication costs between them. And, finally, the competition policy (COM) of a host country j is added to the basic specification for the purpose of this investigation.

The data of FDI flows were drawn mainly from the OECD. This data source provides the disaggregated bilateral FDI outflows from 30 OECD source countries over the period 1985–2007.¹⁶ Since the focus is on the effects of ASEAN competition policy, the scope of FDI recipients is restricted to ASEAN-5 countries, plus the additional five countries that have close cooperation with ASEAN; namely, Australia, China, India, Japan, and Korea.

The estimation results of the gravity model are presented in Table 7. As expected, the estimated coefficients of the GDP variables were positive and significant. This result indicated that the sizes of both FDI source and host countries were relevant to the level of FDI flows. The estimated coefficient on per capita GDP of the FDI source countries was found to be negative. The geographic distance between the source and host countries had a negative impact, and the effect of communication cost was not significant.

¹⁵ For instance, Kreinin and Plummer (2008) used a gravity model to estimate the effect of regional economic integration on FDI flows. Sudsawasd and Mongsaawad (2007) applied the model to estimate trade potentials for ASEAN-5.

¹⁶ See www.sourceoecd.org (accessed on October 16, 2009). The list of the 30 OECD source countries is shown in Appendix A.

With reference to the effects of competition policy on FDI flows, the estimated coefficients of most competition policy indicators were positive and significant (except *Foreign investors* and *Price controls*, which were positive but not significant). In general, the finding confirmed that increasing market competition had strong positive effects on total investment share partly through increasing foreign investment.

The estimated impacts of ASEAN competition policies on FDI inflows are presented in Table 8. As in the previous section, the estimations were based on the assumption that all ASEAN countries will become as competitive as Singapore. Since only ASEAN-5 data were available and all other ASEAN countries besides Singapore were identified as developing countries, the *Competition legislation* indicator, the only robust competition policy indicator in the developing country dataset, was analyzed. The estimations based on the estimated coefficient from the gravity model indicated that foreign direct investment inflows from the 30 OECD countries to ASEAN-4 countries will increase from 0.63% (Malaysia) to 1.24% (Philippines).

7. Concluding remarks

This paper revealed positive and robust correlations between various competition policy indicators and the share in total investment in GDP per capita. The finding suggests that increasing competition intensity might be one of interest to policymakers as a way to create a good investment environment. Developing and developed countries were found to benefit from strengthening competition in terms of growth in total investment share, where the areas of competition policy were narrowed to competition legislation efficiency improvement for developing countries and to less government anti-competitive price control intervention for developed countries; both were found to jeopardize the investment share. Although the suggested areas of competition policy are beyond the current scope of ASEAN economic cooperation, as specified in the AEC Blueprint, they are still consistent with the AEC goals: to increase regional economic efficiency and to remove barriers to cross-regional economic integration. These areas might be worth pursuing in the near future.

As stated, there are large variations in existing competition policies within the ASEAN region. These large policy variations may be a major obstacle to the success of ASEAN competition policy. However, the formation of the regional competition policy is tempting. If ASEAN-4 countries can improve their competitiveness such that each rises to the same level as that found in Singapore, the most competitive country in the region, the share of total investment in GDP per capita in these countries is expected to increase to around 2–4%. Additionally, the FDI inflows from the 30 OECD countries are expected to increase approximately 0.63–1.24%.

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Appendix A. Data Appendix

A.1. List of 50 countries

Argentina, Australia, Austria, Belgium, Brazil, Canada, Chile, China P.R. Mainland, China P.R. Hong Kong, Colombia, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, India, Indonesia, Ireland, Israel, Italy, Japan, Jordan, Korea, Luxembourg, Malaysia, Mexico, Netherlands, Norway, Philippines, Poland, Portugal, Romania, Russia, Singapore, Slovak Republic, Slovenia, South Africa, Spain, Sweden, Switzerland, Taiwan, Thailand, Turkey, United Kingdom, United States, Venezuela Rep. Bol.

A.2. List of 30 OECD (FDI source) countries

Australia, Austria, Belgium, Canada, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Japan, Korea, Luxembourg, Mexico, Netherlands, New Zealand, Norway, Poland, Portugal, Slovak Republic, Spain, Sweden, Switzerland, Turkey, United Kingdom, United States.

Variable and source	
Variable	Definition and sources
COM1	'Legal and regulatory'. (Source: World Competitiveness Yearbook, 2008)
COM2	'Protectionism'. (Source: World Competitiveness Yearbook, 2008)
COM3	'Public sector contracts'. (Source: World Competitiveness Yearbook, 2008)

Appendix A (Continued)

Variable and source	
Variable	Definition and sources
COM4	'Foreign investors'. (Source: World Competitiveness Yearbook, 2008)
COM5	'Competition legislation'. (Source: World Competitiveness Yearbook, 2008)
COM6	'Subsidies'. (Source: World Competitiveness Yearbook, 2008)
COM7	'Price controls'. (Source: World Competitiveness Yearbook, 2008)
COMLANG	Dummy variable = 1 if the two countries share the same language; =0 otherwise. (Source: CEPII's database)
DIST	Distance between countries <i>i</i> and <i>j</i> . (Source: CEPII's database)
FDI	Foreign direct investment at the constant price. (Source: SourceOECD's database)
GDC	Growth rate of (net) domestic credit at the constant price. (Source: World Development Indicators (WDI), 2008)
GDP	GDP at the constant price. (Source: World Development Indicators (WDI), 2008)
GDPPC	GDP per capita at the constant price. (Source: World Development Indicators (WDI), 2008)
GOV	Government share of real GDP per capita at the constant price. (Source: Penn World Table (PWT) 6.1)
INFL	Inflation. (Source: International Financial Statistics, 2008)
INV	Investment share of real GDP per capita at the constant price. (Source: Penn World Table (PWT) 6.1)
RGDPPC	Real GDP per capita at the constant price. (Source: Penn World Table (PWT) 6.1)
STGDC	Standard deviation of GDC. Calculated by using the square root of the squared residual of an estimation of GDC regressed on a constant term and time trend.
STINFL	Standard deviation of INFL. Calculated by using the square root of the squared residual of an estimation of INFL regressed on a constant term and time trend.
X	Trade share, total trade as % of GDP per capita at the constant price. (Source: Penn World Table (PWT) 6.1)

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