

**A QUANTITATIVE EVALUATION OF EFFECTIVENESS AND EFFICACY OF  
COMPETITION POLICIES ACROSS COUNTRIES\***

**Abstract**

This paper proposes a quantitative, cross-sectional, framework for ex-post evaluation of competition policies from relevance, effectiveness and efficacy perspectives. The paper evaluates competition policy effectiveness and outcome efficacy in the sample countries. The evaluation has two levels that focus on an intermediate outcome and a final outcome, respectively. The intermediate outcome is defined as “competition policy implementation and enforcement effectiveness.” A positive link from the legal framework and resource use to competition policy implementation and enforcement indicates an effective intermediate outcome. The final outcome is defined as “national competitiveness to attract foreign direct investment (FDI).” A positive link from a country’s intermediate outcome effectiveness to the country’s competitiveness to attract FDI is interpreted as an efficacious final outcome. These two links are quantitatively estimated through numerical indicators. Statistical results obtained are consistent with the existence of measurable implementation gaps (1) between the developing and the developed countries, and (2) between the recent European Union members or candidate(s) and the more senior E.U. members, controlling for the level of resources used in competition enforcement. These gaps cannot be bridged merely by increasing the size of the competition agencies’ budgets. Reorganizing agencies’ spending priorities as well as developing extra-agency initiatives can be complementary means to bridge these gaps.

---

\* The author thanks Cihan Aktaş of Turkish Competition Authority, Dr. Refet Gürkaynak of Bilkent University, Dr. David Eisenstadt of MICRA, attendees of a presentation to the Turkish-American Business Forum, CUTS/CDRF, attendees of a CUTS/CDRF symposium, and two anonymous referees. Any errors are the author’s responsibility.

## **I. INTRODUCTION, STATEMENT OF OBJECTIVES AND SUMMARY**

Competition laws and a policy focus on domestic competition have spread across many countries especially within the past two decades.<sup>1, 2</sup> Developments within individual countries often paralleled, and in some cases, were influenced, by developments within multinational bodies such as the European Union (E.U.) and by policy assistance and/or policy advice from international organizations such as the World Bank, the EBRD, and the OECD.<sup>3</sup> Because of this spread in competition laws and policies, there is an increasing need for independent evaluations of such laws and policies.<sup>4</sup>

This paper proposes a quantitative, cross-sectional, framework for ex-post evaluation of competition policies from relevance, effectiveness and efficacy perspectives. The evaluation has two levels that focus on an intermediate outcome and a final outcome, respectively.

The intermediate outcome is defined as “competition policy implementation and enforcement effectiveness.” Implementation of competition policies is achieved through the use of a mechanism (or technology) that enforces the existing competition laws and regulations through resource use (e.g. agency budget). For the purposes of this study, the

---

<sup>1</sup> Unless noted otherwise, “competition” as an adjective is used as a synonym for “antitrust.”

<sup>2</sup> For example, Dutz and Vagliasindi (1999) note that during the period 1990-1996, “competition laws have been adapted in 22 of the 26 transition economies of central and eastern Europe and the former Soviet Union.”

<sup>3</sup> The E.U., the World Bank and the EBRD offer technical assistance to their respective member countries to for strengthening competition policy definition and implementation, and policy enforcement, of their members. OECD has been dispensing policy advice to its members for introducing more rigorous competition and deregulation; see, for example, Crampton (2003), who cites OECD’s *1997 Regulatory Reform Report* for the statement that “reform should be built on a foundation of competition policy.”

<sup>4</sup> This is not to say that evaluations of antitrust policy have never been attempted by national or multinational bodies and international organizations. In fact, some multinational bodies and international organizations, such as the World Bank, have a reputation for the importance they place upon and the support they give to evaluations of past and present policy and advice. These evaluations, however, presumably reflect the national perspective, or the membership composition, of these bodies and organizations.

success of the intermediate outcome is measured by the level of domestic competition index assigned to each country by the World Economic Forum (“the WEF index”). The links from (a) legal infrastructure (competition laws) to implementation, and (b) from resource use (e.g. competition agency budget) to implementation are evaluated. A positive link is interpreted as an effective intermediate outcome.

The final outcome is defined as “national competitiveness to attract foreign direct investment (FDI).” For the purposes of this study, the success of the final outcome is measured by the ratio of the FDI inflows to national income. The link from a country’s effectiveness to achieve the intermediate outcome to the level of the FDI inflow (as a percentage of the national income) is estimated. A positive link is interpreted as an efficacious final outcome.

Differences in countries’ competition policy effectiveness and differences in countries’ policy efficacy have implications for policy priorities both within and across groups of countries. For example, if a significant effectiveness gap exists between the developing and the developed countries, it is natural to ask whether and to what extent this gap can be explained by the amount of resources allocated to competition agencies.

This study measures differentials in competition policy effectiveness and differentials in policy efficacy (1) between the developing and the developed countries, (2) between the European Union members and others, and/or (3) between the recent European Union members or candidate(s) and the more senior E.U. members. The analysis begins with two primary questions: (i) “Are differences in competition policy effectiveness between countries explained exclusively by competition agency budget and staff numerosity as direct inputs?” and: (ii) “are the gaps in policy efficacy between

countries explained exclusively by differences in competition policy effectiveness between countries?” Each of these primary questions is associated with a secondary question: (i) “Which variables other than direct inputs might significantly explain differences in competition policy effectiveness?” and: (ii) “which variables other than competition policy effectiveness might explain the differences in policy efficacy?” The statistical technique of multiple regression analysis is used to research these questions.

*A. Competition policy implementation and enforcement effectiveness*

When evaluating competition policy effectiveness, it is natural to hypothesize that effectiveness of competition policy in a country will increase with the extent of competition laws and the amount of resources allocated to competition policy enforcement (e.g. the agency budget). This study first considers the relationship from the extensiveness of competition laws and policy implementation, to enforcement effectiveness. The study then estimates a statistical relationship from competition agency resource use, to implementation and enforcement effectiveness. It derives an “effectiveness gap” (or “effectiveness premium”) for each country in the sample, defined as the difference between the actual level of effectiveness and the predicted level of effectiveness based on input use.

This study then researches whether systematic gaps in implementation effectiveness exist between groups of countries that cannot be attributed to differences in resource use. Its primary conclusion is that there are simultaneous gaps in the implementation effectiveness between (1) developing versus developed countries, (2) E.U. versus non-E.U. countries, and (3) recent E.U. members and candidates versus more

senior E.U. members. These gaps are not explained by differences in the level of resources allocated to competition policy enforcement across countries.

The study also researches whether implementation effectiveness is also a function of time. If so, countries with extensive competition laws and/or relatively large enforcement budgets but a low level of implementation effectiveness (such as the recent E.U. members and the candidates) can expect to strengthen their implementation effectiveness over time.

*B. Policy efficacy*

As noted above, the measure of policy efficacy used in this study is the sample countries' level of FDI competitiveness. The relevance of the existence and enforcement of competition laws and policies on private capital's incentives to invest and innovate is not *a priori* apparent. For this reason, the direction (or the magnitude) of the relationship between competition policy and competitiveness to attract FDI is not theoretically clear. This study estimates a relationship between competition policy effectiveness and final outcome efficacy, and derives an "efficacy gap" (or an "efficacy premium") for each country in the sample, defined as the difference between the actual level of efficacy and the predicted level of efficacy based on competition policy effectiveness.<sup>5</sup>

---

<sup>5</sup> Reducing the efficacy gap may require actions at the level of a country's general governance and minimizing general risk and uncertainty for the country as a whole. For example, Nicholson (2004) observes that "the larger Western economies [...] shoulder, in general, relatively stronger rule of law, intellectual property protection, control of corruption, and other indicators of institutional maturity, which may positively interact with antitrust regimes" (p. 11). As another example, Maskus (2000) emphasizes possible complementarities between antitrust regimes and property rights, market liberalization, deregulation, and technology development policies. The maintained hypothesis of this paper is that effective antitrust implementation and effective governance in other areas contribute to efficacy in separately identifiable ways. This would imply that a significant reduction of the efficacy gap is almost certain to require a higher level of effort than ensuring effective implementation of competition laws and policies only.

The study concludes that a positive relationship exists between effective implementation of competition laws and policies and an efficacious final outcome. Therefore, development and implementation of such laws and policies is relevant for national competitiveness. It is concluded that efficacy may also be a function of binary variables (for example, E.U. membership). If so, efficacy can partially be increased through a binary transformation in a country's status. Conversely, an efficacy gap may persist as long as economic and other types of conditions preclude a binary transformation.

Results presented in the study have important policy implications. They suggest that the gaps between the developed and the developing countries cannot be bridged merely by increasing the size of the competition agencies' budgets. Reorganizing agencies' spending priorities as well as developing extra-agency initiatives can be complementary means to bridge these gaps. Examples of extra-agency initiatives include civil society organizations, ability of private parties to initiate lawsuits under the competition laws, and ability to collect private damages from violators.

The rest of the paper is organized as follows. Section II presents the paper's policy evaluation framework and quantitative indicators used; it also selectively surveys existing empirical literature on the (implicit or explicit) use of FDI inflows as a measure of policy efficacy, either generally or with specific reference to policies aiming increased investment. Section III comments on the sample and the methodology. Section IV presents results. Section V concludes.

## **II. BACKGROUND: EVALUATION FRAMEWORK AND QUANTITATIVE INDICATORS**

Figure I demonstrates a schematic view of the ex-post policy evaluation framework used in this paper. In this framework, competition laws and available resources for enforcement are represented as inputs to an enforcement technology. Effective and consistent use of a suitable enforcement technology is expected to result in an optimal intermediate outcome. Enforcement may result in a suboptimal intermediate outcome if the enforcement technology being used is not suitable for the task, compromising effectiveness and leading to a welfare loss.<sup>6</sup> In this framework, a suboptimal (inefficient) final outcome may be observed even when the competition enforcement technology is suitable and effectively implemented. This outcome may arise if governance in other policy areas is ineffective or policies are inadequately coordinated across policy areas.

Measurement, or ranking of countries with respect to intermediate and final outcomes is probably essential for a systematic evaluation of competition policy effectiveness and efficacy across countries. This is not a simple task, primarily because it requires some form of quantification along the pertinent dimension.<sup>7</sup> And, many quantitative variables or indices that can be used for this purpose are usually imperfect (e.g., biased due to a combination of measurement error, truncation, and endogeneity).

### *A. Quantitative measures for evaluating the effectiveness of the intermediate outcome (competition enforcement) relative to the inputs*

---

<sup>6</sup> Of course, an inconsistent, unpredictable and erratic use of a given technology may also result in a suboptimal outcome.

<sup>7</sup> Measurement usually implies cardinality. In contrast, countries can be ranked using either a cardinal or an ordinal scale.

Nicholson (2004) discusses surveys and comprehensive analyses of inputs and outputs of competition enforcement. He discusses research by Kee and Hoekman (2003), Evenett (2002), Lapachi (2002), Dutz and Vagliasindi (2000), Fingleton *et al.* (1998), Pittman (1998), Graham and Richardson (1997), Hoeckman (1997), and Jenny (1995). As a new measure to assess the presence of competition laws across countries, he introduces the Antitrust Law Index (ATLI), the sum of each country's binomial scores for the presence of particular laws.<sup>8</sup>

For quantification of the inputs and the intermediate outcome (i.e., implementation and enforcement effectiveness), this paper uses, and where possible, supplements, the following four variables discussed and displayed by country in Nicholson (2004): the *ATLI* (described above); *competition agency budget size* and *competition agency staff count* compiled by Global Competitiveness Review (GCR); and a *domestic antitrust effectiveness rating* compiled by the World Economic Forum (WEF).<sup>9</sup> In addition, years in which countries enacted competition laws for the first time

---

<sup>8</sup> He notes that the countries with the highest index values do not necessarily represent the strongest antitrust laws; and that the impetus for adopting antitrust laws appears related to the imposed guidelines of supranational bodies, in particular the requirements of the European Union. He mentions Ginarte and Park (1997) and Rapp and Rozeck (1990) as examples of research on intellectual property rights which use a comparable methodology.

<sup>9</sup> Nicholson (2004, p. 7) describes the WEF ratings as follows:

A comprehensive set of countries is covered in a survey conducted by the World Economic Forum (WEF), but is limited to a relatively subjective and simple valuation of the broad characterization of anti-monopoly policy. The WEF surveyed business leaders in 2001 to rate the effectiveness of antitrust policy in various countries, asking them to rate "antimonopoly" policy from "1=lax and not effective and promoting competition" to "7=effectively promotes competition". The results are published in the *Global Competitiveness Report 2001-2002*, and replicated in Table 2.

Nicholson also includes a "regime/institution score" determined by the GCR Survey. This score is positively and significantly correlated with the WEF rating; this finding confers an independent degree of reliability upon the WEF rating. This positive and significant correlation also renders the GCR Survey



have been compiled from the International Competition Network, the Global Competition Forum, and Dutz and Vagliasindi (1999).<sup>10</sup>

*B. Quantitative measures to evaluate the efficacy of the final outcome relative to the intermediate outcome*

This study uses countries' levels of FDI inflow<sup>11</sup> as a quantitative indicator of final outcome (national competitiveness to attract FDI).<sup>12, 13</sup> Mehta and Evenett (2006) define competitiveness as “many features of a nation’s corporate performance compared to firms located abroad.” They emphasize “firms, not nations, compete and so properly understood competitiveness is not a characteristic of government or state, but of the firms within a jurisdiction.” They note “by fostering competition between domestic firms, governments are thought by some to foster national competitiveness.”<sup>14</sup>

The direction or the magnitude of the relationship between competition policy and foreign direct investment is not immediately clear. FDI flows have been empirically

---

largely redundant as an additional indicator; the cross-sectional variation reflected by the GCR Survey is adequately represented by the WEF rating to a reasonable degree for the purposes of this paper.

<sup>10</sup> For most countries, the enactment or effectiveness years are from the International Competition Network or the Global Competition Forum websites although the value for Canada has been revised to reflect the initial enactment of the Canadian anti-monopoly law; the value for Poland is from Dutz and Vagliasindi (1999).

<sup>11</sup> World Bank (2004) series “Gross foreign direct investment (% of GDP).” Series id: *BG.KLT.DINV.GD.ZS*, year 2002.

<sup>12</sup> This definition of competitiveness is more specific than that in Mehta and Everett (2006); the latter includes many features of corporate performance, such as “share of world markets, the rate of innovation, and the level of import penetration.” This paper shares the view in Mehta and Everett (2006) that competitiveness is a characteristic of firms within a jurisdiction. Since most FDI inflows are measured and reported on a country basis, the relevant jurisdiction is hypothesized as a country. This hypothesis is statistically tested in Section IV below.

<sup>13</sup> A strand of the existing literature analyzes countries’ relative competitiveness and/or the process of competition between countries (e.g., regulatory incentives) to attract FDI. For example, Inal (2003) surveys various definitions of competition and discusses some of the quantitative indicators that are present in that literature. The analysis presented in this paper partially overlaps with that literature; the present analysis also differs from that literature because, unlike the latter, it specifically focuses on the “ambient” effect of antitrust policies (antitrust implementation and enforcement) on FDI inflows. This paper’s focus on the FDI inflows as a measure of efficacy also differs from that of the literature on the determinants of FDI.

<sup>14</sup> They reference U.K. and E.U. white papers on this point.

associated with privatization;<sup>15</sup> foreign investment flows have also been thought related to deregulation and market liberalization.<sup>16</sup>

Complementarities in attracting FDI may exist between competition regimes and property rights, market liberalization, deregulation, and technology development policies.<sup>17</sup> However, it is also recognized that in the absence of an effective competition policy, privatization,<sup>18</sup> deregulation or liberalization<sup>19</sup> are not sufficient to ameliorate welfare losses arising from anticompetitive conduct.

All else equal, investors would be attracted to market power<sup>20</sup> and anti-liberal protections, as long as they can benefit from these. Investors would be dispelled by market power if they believe that the distribution of market power (across markets or across firms in a market) can harm their interests. For example, investors may believe that incumbent firms in a market can use their market power to exclude entrants. Such a belief would tend to diminish the investors' willingness to enter into the market. Investors would also prefer competitive upstream and downstream markets.<sup>21</sup> Risk aversion may also affect the magnitude and the direction of the relation between market power and FDI. If potential entrants are risk-averse, then the likelihood of entry into a market can be expected to increase with the degree of evenness (symmetry) of the distribution of market

---

<sup>15</sup> Sader (1995) and (1993).

<sup>16</sup> Crampton (2003, p. 15)

<sup>17</sup> Maskus (2000).

<sup>18</sup> Crampton (2003, p.2) citing Wallensten (1999).

<sup>19</sup> Crampton (2003, p. 18).

<sup>20</sup> Market power is defined as the power to sustain price over the competitive level for a significant duration of time.

<sup>21</sup> This is because double markups will tend to reduce sales and profits. In addition, the level of *existing* market power in a vertically related market may lessen the profitability of *incremental* market power in the market of entry, because any additional profit due to increased market power will have to be "shared" by the upstream or the downstream firm (the supplier or the distributor).

power across markets and across market participants, as well as the entrant's degree of certainty that it will enjoy a given level of market power.

A *CUTS—C-CIER* briefing paper<sup>22</sup> underlines that the observed direction of the relationship between competition effectiveness and investment inflows can be either positive or negative. The paper looks at two different examples: soft drinks in India and cement markets in Zambia. The first example narrates that in the absence of adequate competition laws or effective enforcement, foreign entry (direct investment) can be correlated with market conditions suitable for an increase in market concentration. (In India, foreign entry into the soft drinks market resulted in a virtual duopoly between the two foreign entrants, Pepsi and Coca-Cola.) In this case, the FDI inflow would appear negatively correlated with competition effectiveness (or positively correlated with an absence thereof). The second example illustrates how well implemented and adequately enforced competition laws can avoid an increase in the market power, while maintaining the FDI inflow. (In Zambia, new entry by Lafarge did not increase market concentration and possibly created cost efficiencies thanks to a timely intervention by Zambia Competition Commission.) In this case, the FDI inflow would appear positively correlated with competition effectiveness.

Dutz and Vagliasindi (1999), Khemani (2003) and Crampton (2003) are three examples of studies that use measures of final outcome other than FDI. These three studies research the relationship from competition effectiveness to average firm efficiency, national income, and R&D intensity, respectively.

Dutz and Vagliasindi (1999) define a range of competition policy implementation criteria along *enforcement*, *competition advocacy* and *institutional effectiveness*

---

<sup>22</sup> *CUTS—C-CIER* (2005).

dimensions. They also provide an assessment of the effectiveness of competition policy implementation across eighteen countries, split equally between central or eastern European or Baltic countries and the former Soviet Union countries, using data from each country's competition authorities. They find a robust positive relationship between effective competition policy implementation and expansion of more efficient private firms.<sup>23</sup> They stress “having a competition law on the books, or having an up-and-running competition agency, is not a sufficient condition for effective implementation” (p. 9).

For a cross section of countries Khemani (2003) presents visual relationships between average industry competitiveness (alternatively, prevalence of new entry into the industry) measured on a scale of 1-7, and per capita GDP (alternatively, GDP growth rate). He concludes that competition in domestic markets through either inter-firm rivalry or new entrants is positively associated with higher levels (alternatively, higher growth rates) of per capita GDP.

Crampton (2003) emphasizes that in the long run “innovation accounts for most of the improvements in average living standards that flow from greater competition. This applies in both developed and developing economies”; he also states that “procompetitive reform explained more than one third of the excess R&D intensity in the U.S., Japan, German and Sweden relative to the OECD average and provided a large positive contribution in the U.K., Canada and Ireland. Conversely, excessive regulatory restrictions to competition in Italy and Greece were estimated to account for one third and

---

<sup>23</sup> On the other hand, they do not find a robust effect of competition advocacy. They comment “this is a most difficult area to implement effectively across all transition economies. It requires the competition authorities to gain expertise not only in traditional anti-trust enforcement but also in the other industry oversight (especially network infrastructure industries). It also requires sufficient resources to be spent on effective education.” (*ibid.*)

two thirds, respectively, of the shortfall in R&D intensity relative to the OECD average.”<sup>24</sup> The specific procompetitive policies that were analyzed in the referenced study, and whether competition policy is one of them, are not made clear in Crampton’s remarks.

Although each of the measures of final outcome used by the three studies discussed immediately above (namely, average firm efficiency, national income, and R&D intensity) is suitable for evaluating the effect of competition policy implementation on static or dynamic efficiency or national prosperity, the specific aim of the present study is to research the relationship between competition policy implementation and national competitiveness measured by FDI inflows. There is a large volume of literature that discusses the determinants of FDI inflows. The remainder of this subsection presents a selective survey of these studies, with particular emphasis on the developing countries.

Goldberg (2004) selectively surveys the literature on FDI with a particular emphasis on the financial sector. She concludes that multinationals and FDI in emerging markets generally have important effects on the host countries, with particularly notable effects in financial services. These effects include improved allocative efficiency, technology transfer and diffusion, wage spillovers, institution building, altered macroeconomic cycles, and overall economic stability. Allocative efficiency is enhanced when foreign investors enter markets characterized with high entry barriers and reduce monopolistic distortions. Increased competitive pressures and demonstration effects may spur local firms to enhance technical efficiency. In financial services, a positive association between FDI and institutional development is expected through improved

---

<sup>24</sup> He cites to para. 18 of G. Nicoletti (2002) “The Economy-wide Effects of Product Market Policies,” paper presented at the OECD-World Bank Services Experts Meeting, OECD Headquarters, Paris.

supervision and regulation, although there may be a lag due to initial conditions (e.g. the level of preparedness of the supervising agency to evaluate the new products and the new processes introduced by foreign entrants). The employment and growth effects of FDI depend on the type of investment (greenfield vs. merger or acquisition), and in the case of an acquisition, on the soundness of the acquired institution.

Singh and Jun (1995) empirically analyze various factors that influence direct investment flows to developing countries; they examine qualitative factors. Their findings differ between the group of countries that have historically attracted high FDI inflows and others that have not. For the first group, they find that qualitative indices of political risk and business operation conditions, and exports in general and manufacturing exports in particular, are significant determinants of FDI. For the second group, they find that sociopolitical instability measured by lost person-hours because of a labor dispute has a negative impact on investment flows.

Banga (2003) addresses the effectiveness of selective government policies and investment agreements in attracting FDI flows to developing countries, and whether FDI from developed and developing countries respond similarly to developing countries' policies. He examines the impact of fiscal incentives, deregulation and bilateral and regional investment agreements, while controlling for host countries' economic fundamentals. He finds that while FDI originating from a developed country responds to deregulation, FDI with a developing country origin can be attracted by fiscal incentives and lower tariffs.

Neven and Siotis (1993) discuss the role of European competition policy in monitoring the intervention of member states towards FDI; they find that current

subsidies to attract investment are not excessive in the presence of strong distortions in the labor market.

To find the impact of private practices on FDI inflows, Noland (1999) reviews documentary evidence from various countries and econometrically analyzes industry-level FDI inflows into the United States and Japan. He concludes that general economic conditions or specific policies facilitated by private practices are likely to discourage FDI. Industry concentration is negatively but not robustly associated with FDI. He also finds that for these two countries R&D expenditures are positively associated with FDI flows.

Various OECD papers address effectiveness and efficiency of incentives in attracting FDI. OECD (2002) advocates the use of general investment subsidies rather than incentives available to FDI only. Charlton (2003) finds that it is difficult to assess whether, or in what cases, the efficiency gains from competitive bidding for mobile capital outweigh the costs to the international system, and surveys examples of inter-regional and international competitive bidding for investment. OECD (2003) assesses the degree to which developing countries compete against each other and against the most highly developed economies in attracting FDI through incentives. It concludes that while developing countries compete with each other, few directly compete with developed economies; also, competition for individual investment projects seems confined to a few sectors, *e.g.* car production.

Dahl (2002) examines foreign direct investment (FDI) in the Southern African Development Community (SADC) in the 1990s and considers possible incentives for FDI. He concludes that FDI may be attracted to countries belonging to integrated

regional groups; that resource-driven investments in Southern Africa seem to be primarily driven by factors such as FDI regimes, privatization, low cost labor and per capita GDP growth, rather than general economic fundamentals; and that “soft parameters” such as administrative barriers and the overall poor image of Africa may be important.<sup>25</sup>

Maskus (2000) reviews the theory and evidence on how protection of intellectual property rights may influence FDI flows and technology transfer. He notes that strong intellectual property rights (IPRs) can be an effective incentive for FDI inflows; complementarities may also exist between IPRs and market liberalization, deregulation, technology development policies, and competition regimes in attracting FDI. He advises governments to devote attention and analysis in order for assuring that their countries will achieve net gains from stronger or additional IPRs and licensing over time.

FitzGerald (2002) examines whether countries’ regulatory competition in property rights, market access rules, environmental protection, and labor standards for attracting FDI affects the level and “quality” (*e.g.*, technology level, degree of stability, employment creation) of the investment they receive, and whether such competition leads to a welfare loss for the nominal winners and losers. He concludes that for some poor countries, regional arrangements may be more effective than international rules. He states that the published empirical evidence is ambiguous on the existence, effect and consequences of regulatory competition. Critically, he emphasizes that the usual measure of FDI is “changes in equity stake that include acquisitions and exclude third-party

---

<sup>25</sup> He states that most of the developing countries that were in the “top ten” with respect to FDI inflows in year 1999 fulfilled the following criteria: regional group membership, per capita income growth, foreign market access, skilled labor force, low-cost unskilled labor, high level of GDP, fiscal discipline, favorable corporate tax structure, and political stability. (p. 3)



finance” and as such, it does not reflect capital formation by multinational corporations.<sup>26</sup> He warns that any empirical study which posits a positive relationship between high regulatory standards and foreign investment<sup>27</sup> cannot exclude the possibility of a spurious association unless it controls for per capita income or market size.<sup>28</sup>

Charlton (2003) reviews the role of investment incentives, analyzing their main benefits and costs. He notes that regulatory competition between countries can have both positive and negative effects on both domestic and international welfare; a negative outcome would occur either when a government offers an incentive package such that the value of the concessions exceed the value of the benefits to the host economy, or when it uses inefficient incentive instruments. He concludes that since no individual government has an incentive to unilaterally reveal the value of their incentive packages in the absence of similar and simultaneous action by other governments, explicit international coordination may help to improve disclosure standards.

Waldkirch (2003) uses industrial branch level data from Mexico to examine the degree to which FDI is attracted to particular sectors in a country on the basis of available domestic skills. He finds a direct correlation between skill differences and FDI across sectors.

---

<sup>26</sup> He states: “in particular, large privatizations in developing and transition countries, and mergers in industrial countries, have distorted the published FDI figures seriously during the past decade” (p. 12). Although the empirical consequences of this proposition should be studied, they go well beyond the aims of this paper.

<sup>27</sup> That is, a study which negates the existence of a “race to the bottom,” *i.e.*, cutthroat regulatory competition.

<sup>28</sup> “All regulatory standards – whether on property and competition, on environmental protection or on labor standards – tend to improve with a country’s income level. In addition, small countries are clearly in a weaker negotiating position with regard to large companies and large neighbors. Thus we would expect to see the incentive for a government to engage in regulatory competition to decline with both income and size. But income levels and market size are agreed to be the main attraction for FDI itself. So we would in fact expect to observe a statistical correlation between regulatory standards and inward FDI even if there were no causal connection” (FitzGerald 2002, p. 2; emphasis in the original).

Blonigen and Wang (2004) examine whether the determinants and effects of FDI are systematically different for less developed countries than for developed countries. Using a semi-logarithmic functional form, they interact their exogenous variables with a developed country dummy variable; they find that the underlying factors that determine the location of FDI activity across countries vary systematically across the two groups of countries. Their aggregate data support the growth effect of FDI only for the less developed countries. They also find that FDI is more likely to crowd in (less likely to crowd out) domestic investment in less developed countries relative to developed countries.

### **III. SAMPLE OF COUNTRIES AND METHODOLOGY**

The agency budget variable is available for 38 countries in Nicholson (2004). Turkish Competition Agency (2004) and World Bank (2004) have been used to include Turkey as the 39<sup>th</sup> country. The WEF rating is defined for 49 countries; 35 countries comprise the overlap between the WEF rating and the agency budget variables. The ATLI is defined for 52 countries; 42 countries make up the overlap between the WEF rating and the ATLI. The FDI inflow variable contains non-missing values for 53 countries, 46 of which also have a WEF rating.

This paper first reviews the empirical relationships between policy effectiveness measured by the WEF rating and the following “input” variables: the ATLI, size of the enforcement budget, and size of the enforcement staff. The relationship between size of the budget and effectiveness of the intermediate outcome is graphically displayed and statistically estimated. Then, this relationship is re-estimated while controlling for

additional explanatory variables (economic development status, incidence and duration of E.U. membership, and duration of competition laws). Lastly, the relationship from effectiveness (measured by the WEF rating) to efficacy (measured by FDI inflows) is graphed and statistically estimated while controlling for additional explanatory variables (population size and E.U. membership).<sup>29</sup>

#### **IV. RESULTS**

*A. Competition policy implementation and enforcement effectiveness as a function of policy inputs and other external variables*

Figure II plots the ATLI on the horizontal axis and the WEF rating on the vertical axis. Relative sizes of data points and of the country names (relative size of the typeface) correspond to the age of competition laws in each country. Years of enactment (or legal effectiveness) of the laws are stated in parentheses next to the names of the countries. This picture hints at a rough distribution of the sample countries with respect to the historical nature of market competition in each country.<sup>30</sup> Start at the northeast and proceed clockwise. The northeast corner represents “competition by choice,” defined as an effective outcome built upon strong legal foundations. The closest example is the United States. The southeast corner represents competition issues having arisen as a “historical necessity.” The closer is a country to the southeast corner the greater the likelihood of having seemingly strong legal foundations but lacking an effective outcome. All of the recent E.U. members and candidate countries that are included in the sample

---

<sup>29</sup> There is the question whether the WEF rating is a catchall variable that measures the efficacy of a country’s general governance, rather than reflecting the efficacy of a more narrowly defined competition (antitrust) implementation. This question is addressed below.

<sup>30</sup> The four corners are meant to represent the four extremes of possible combinations of ATLI and WEF ratings, rather than four possible categories of countries.

fall closest to this corner. The southwest corner represents “policy inertia.” The causes and the nature of this inertia possibly differ across the countries, yet the result is similar: a weak legal structure and a poor intermediate outcome. Finally, the northwest corner represents “competition as a historical accident,” typified by a low ATLI value (few competition laws) yet a competitive economy at least as measured by the WEF rating.<sup>31</sup> Some of the closer examples are the Netherlands, the U.K., and New Zealand.

A positive relationship between competition legislation and an effective intermediate outcome would certainly add realism to the expectation that at least some of the countries currently with a relatively high ATLI value but a relatively low WEF rating (i.e., countries currently closer to the southeast corner) can hope to achieve effectively competitive markets through efficient and consistent application of their competition laws. Such a positive relationship is not apparent from Figure II. However, a positive relationship between ATLI and the WEF rating could arise if individual (constituent) states of the U.S., many, perhaps all, of which have independent competition laws and enforcement mechanisms, are included in this picture. Many of these individual states are presumably characterized by similar ATLI-WEF combinations as the federation itself; they are putatively represented as smaller dots around the data point representing the U.S. as a whole.

Figure III depicts the relationship between direct input use measured by agency budget size and intermediate outcome measured by the WEF rating. Figure III has “agency budget” (U.S. dollars, in logarithms) on the horizontal axis and the WEF rating

---

<sup>31</sup> E.U. countries with high WEF ratings might have benefited from effective implementation of E.U.’s antitrust laws, which are not captured in their respective ATLI values. This point applies as well to E.U. countries near the northeast corner (e.g. France) as to those near the northwest corner. I thank Jennifer M. Morrison, Esq., for pointing this out.

on the vertical. The straight line represents the best semi-logarithmic fit. A positive relationship can be observed. In addition, diminishing returns to budget size are implied by the convexity of a semi-logarithmic relationship.

The difference between an observed and an expected WEF value (the residual) is tentatively interpreted as an “effectiveness premium” (in the case of a positive residual) or an “effectiveness gap” (in the case of a negative residual). According to this interpretation, countries such as Latvia, Japan, Korea, Mexico and Turkey should be able to achieve higher WEF ratings given their respective competition agency budgets. These countries suffer from an effectiveness gap that is potentially attributable to relatively inadequate enforcement technologies.<sup>32</sup> At the other side of the spectrum, countries such as Ireland, the U.K., and the Netherlands are performing even better than expected on the basis of their competition budgets alone. These countries enjoy an effectiveness premium that is potentially attributable to relatively adequate enforcement technologies.<sup>33</sup>

The average magnitude of the effectiveness gap is reduced by controlling for the level of economic development (per capita income). Figure IV depicts a separate relationship between agency budget (horizontal axis) and competition policy effectiveness (vertical axis) for the developed and the developing countries. Countries with a per capita income greater than ten thousand U.S. dollars are referred to as “developed” while the rest are referred to as “developing.” The developed countries are grouped in the uppermost section of Figure IV; all but two have an effectiveness rating of

---

<sup>32</sup> For some countries, an alternative or additional explanation may be absence of an adequate legal infrastructure.

<sup>33</sup> The U.S. enjoys a small effectiveness premium. This may partially be thanks to private plaintiffs’ right to sue under the antitrust laws in the United States. However, countering this “private enforcement” premium are the antitrust enforcement budgets of the individual states. The budget figure for the U.S. does not include these resources; see Nicholson (2004), footnote 20. The budget figure for the U.S. does include federal resources allocated for consumer protection (by the U.S. Federal Trade Commission); see *ibid.* footnote 19.

five or higher (the exceptions are Slovenia and Korea). The developing countries are grouped in the lower section; all but one have an effectiveness rating of less than five (the exception is Chile). Each of the two lines represents the average (expected) level of effectiveness corresponding to a given level of the agency budget for either type of country. The higher of the two lines represents the expected level of effectiveness for a developed country with a given agency budget. The lower line represents the expected effectiveness level for a developing country with a given agency budget.

Within the budget sizes displayed in the figure, a secular gap of at least one point is apparent between the expected levels of effectiveness for a developing country and a developed country with identical agency budgets. While there seems to be a positive relationship between agency budget and competition policy effectiveness for both types of countries, raising the competition policy effectiveness of a developing country to the expected level of effectiveness for a developed country with an identical agency budget would appear to necessitate an increase of many orders of magnitude in the developing country's agency budget.<sup>34</sup> An interpretation of this effectiveness gap between the developed and the developing countries is that the first group of countries on average are equipped with more suitable enforcement technologies than the second group.

Figure V depicts a similar discrepancy when the sample of countries is restricted to E.U. members and candidates. Recent members or candidates of the Union are grouped

---

<sup>34</sup> For a developing country with an agency budget of one million dollars, the expected level of effectiveness is about 4. The expected level of effectiveness for a developed country with the same budget size seems to be about 5.3. Achieving an effectiveness rating of 5.3 would appear to necessitate an agency budget of as much as one trillion dollars for the average developing country, all else the same. Although this calculation may not be very precise in a statistical sense, it does highlight the magnitude of the discrepancy between the expected levels of effectiveness between the developing and the developed countries. This example strikingly illustrates that bridging this gap does not appear as practically possible by increasing the antitrust agency's budget only (the average GDP in the sample of developing countries is only 0.23 trillion dollars – less than a quarter of the level of antitrust budget necessary for an expected effectiveness rating of 5.3 for a developing country).

in the lower part of the figure; they have all have effectiveness ratings of less than five. Other, more “senior” members are grouped in the upper part; they all have effectiveness ratings of five or more. Each of the two lines represents the average (expected) level of effectiveness corresponding to a given level of the agency budget for either type of country. The lower of the two lines represents the expected level of effectiveness for a recent member or candidate with a given agency budget. The higher line represents the expected effectiveness level for a “senior” member with a given agency budget.

Within the budget sizes displayed in the figure, a secular gap of more than one point is apparent between the expected levels of effectiveness for the two types of countries with an identical agency budget size. While there seems to be a positive relationship between agency budget and competition policy effectiveness for both types of countries, raising the competition policy effectiveness of a recent member or candidate to the expected level of effectiveness for a “senior” member with an identical agency budget would appear to necessitate an increase of many orders of magnitude in the former country’s agency budget.<sup>35</sup> An interpretation of this effectiveness gap between the recent members or candidates and the more “senior” members is that the first group of countries on average are equipped with less suitable enforcement technologies than the second group.

---

<sup>35</sup> For a recent member or candidate with an agency budget of three million dollars, the expected level of effectiveness is about 4. The expected level of effectiveness for a “senior” member with the same budget size seems to be about 5.5. Achieving an effectiveness rating of 5.5 would appear to necessitate an agency budget of as much as three hundred billion dollars for the average recent member or candidate, all else the same. Again, while this calculation is probably not very precise statistically, it does highlight the magnitude of the discrepancy between the expected levels of effectiveness between the two groups of E.U. members. This example strikingly illustrates that bridging this gap does not appear to be practically possible by increasing the antitrust agency’s budget only (the average GDP in the sample of the recent E.U. members or candidates is less than one trillion dollars, or about three times the level of antitrust budget necessary for an expected effectiveness rating of 5.5 for a recent E.U. member or a candidate.

The numerical relationship between the WEF rating and the competition enforcement agency inputs is estimated using three alternative model specifications. The first model includes only two agency variables: logarithm of the budget – denoted as Log(budget) – and agency staff count relative to national income.<sup>36</sup> The second model also includes three dummy variables indicating E.U. membership (including candidates), whether the country is a new E.U. member or an E.U. candidate, and whether a country is “developed,” defined as having a per capita GDP in excess of \$10,000 in year 2002. The results are displayed in Table I below.

**Table I: Parameter estimates for the WEF rating equation (the dependent variable is the WEF rating).**

Model Specification	Variable	Parameter estimate	Standard error	t-stat	Significance level <sup>a</sup>
WEF.1	Log(Budget)	0.18	0.08	2.39	0.02
	Staff/National income (GDP PPP, bn. \$)	-0.39	0.21	-1.92	0.06
WEF.2	Log(Budget)	0.07	0.05	1.47	0.15
	Staff/National income	0.06	0.15	0.41	0.69
	E.U. member or candidate	0.44	0.22	1.98	0.06
	Recent E.U. member or candidate	-0.90	0.33	-2.74	0.01
	Developed country	0.95	0.24	3.99	0.00
WEF.3	Log(Budget)	0.02	0.05	0.43	0.67
	Staff/National income	0.08	0.14	0.56	0.58
	E.U. member or candidate	0.67	0.24	2.84	0.01
	Recent E.U. member or E.U. candidate	-1.01	0.31	-3.21	0.00
	Developed country	0.73	0.25	2.91	0.01
	Log(Years)	0.25	0.12	2.10	0.04

<sup>a</sup> Rounded to the next lowest significant digit; e.g. a significance level of 0.0049 (or less) is shown as 0.00.

<sup>36</sup> National income is implicitly defined by two of the variables in Table 3 of Nicholson (2004): *Agency Budget* and *Budget/National Income*. Staff relative to national income is defined as  $1000 * \text{staff} / (\text{budget} / (\text{budget} / \text{National Income}))$ , where *budget* is the *Agency Budget* variable in Table 3 of Nicholson (2004). National income is being expressed in billions of U.S. dollars in this calculation since Nicholson (2004)’s *Budget/National Income* variable scales down National Income by a factor of  $10^{-6}$ .



The first two rows of Table I (not counting the label row) display the results of the first model specification. In this model, the WEF rating increases approximately one and a quarter point (1.25) with every doubling of the agency budget,<sup>37</sup> while keeping a constant ratio of staff size to national income. This result is statistically significant at the 5% level of statistical significance. In addition, given budget size, country's WEF rating *decreases* with the number of the agency staff members relative to national income. This result is statistically significant at the 10% level but not at the 5% level. This result does not mean that implementation effectiveness can be raised by reducing the competition agency's employment, but rather that agency staff size is correlated with other variables that characterize countries with low implementation effectiveness.<sup>38</sup>

The next three rows of Table I display the results of the second model specification which includes three dummy variables for developed countries, E.U. members and candidate(s), and *recent E.U. member or E.U. candidate*. The average level of effectiveness for developed countries is nearly one point above that for the developing countries, controlling for agency size both in terms of dollars and staff. Given agency size, being a member of, or a candidate for, the E.U. increases the WEF rating by a little more than 2/5<sup>th</sup>s of a point (0.44), but being a recent member or a candidate

---

<sup>37</sup> The difference between the expected levels of effectiveness for a country with an agency budget of X dollars and another country with an agency budget twice as large (2X) can be calculated using the parameter estimate on the first row of Table I as  $1.8 * [\text{Log}(2X) - \text{Log}(X)] = 1.8 * [\text{Log}(2) + \text{Log}(X) - \text{Log}(X)] = 1.8 * \text{Log}(2) = 1.8 * 0.69 = 1.25$ .

<sup>38</sup> It is natural to hypothesize that competition agency staff numerosity is significantly correlated with the agency budget. This statistical occurrence is technically known as multicollinearity of explanatory variables. Such correlation, if present, would minimize the individual statistical significance of each explanatory variable. In part as a precaution against this possibility, the agency staff is expressed relative to national income. The statistical correlation between this variable (staff relative to national income) and the budget variable is approximately -0.3 in the sample, which is not especially high. Severe multicollinearity would be indicated if explanatory variables are statistically significant jointly but not individually. Neither of the individual variables in model WEF.1 is especially insignificant. This suggests that multicollinearity between the budget and the staff variables is not a serious problem. A desirable property of the multiple regression technique is that it produces unbiased estimates of the coefficients even in the presence of multicollinearity.

*reduces* the WEF rating by nearly the same amount ( $-0.46 = 0.44 - 0.90$ ). This result is consistent with effective implementation being a function of time. When the developed country variable and the two E.U. variables are included among the explanatory variables for WEF, the agency variables become statistically insignificant. This is because the correlation between each of the agency variables and the three dummy variables is near, and sometimes in excess of, the correlation between the agency variable and the dependent variable (the WEF rating).

The relationship between the WEF rating and time is tested more directly in the third model specification. This specification includes the logarithm of *years* as an additional explanatory variable.<sup>39</sup> *Years* is defined as the number of years elapsed since a country's competition laws were enacted or became effective for the first time. This variable has a coefficient estimate of 0.25 that is significant at the 5% level. All else equal, a country's WEF rating is expected to increase about one-sixth of a point (0.17) with every doubling of *years*.<sup>40</sup> Table A.1 in the Appendix displays the ordinary least squares simple regression outputs for these three specifications.

In the first model specification in Table A.1, the  $R^2$  statistic equals 0.30. This implies that the budget and the staff variables explain nearly one-third of the cross-sectional variation in the WEF ratings. In the second model specification in Table A.1, the  $R^2$  statistic equals 0.77. This implies that the agency variables, the E.U. membership variables, and the developed country variable together explain more than three-fourths of the cross-sectional variation in the WEF ratings. The  $R^2$  in the third specification is 0.80,

---

<sup>39</sup> I thank Dr. Refet Gürkaynak for suggesting this model specification.

<sup>40</sup> The difference between the expected levels of effectiveness for a country with  $Y$  number of years and another country with twice the number of years ( $2Y$ ) since the enactment or the effective date of antitrust laws can be calculated using the parameter estimate on the last row of Table I as  $0.25 * [\text{Log}(2Y) - \text{Log}(Y)] = 0.25 * [\text{Log}(2) + \text{Log}(Y) - \text{Log}(Y)] = 0.25 * \text{Log}(2) = 0.25 * 0.69 = 0.17$ .

which implies that the agency variables, the years variable, the developed country variable, and the E.U. variables together explain nearly four-fifths of the total variation of competition policy implementation effectiveness across countries. Tables A.1 and A.3 in the Appendix respectively display the ordinary least squares regression output and the data.<sup>41</sup>

The divide between the developed and the developing countries as well as that between the recent E.U. members or candidate(s) and the more “senior” E.U. members may indicate gaps in policy design, implementation and enforcement that cannot be bridged merely by allocating more resources toward the existing competition enforcement mechanisms in the countries that are currently placed at the lower half of each divide.

*B. FDI competitiveness efficacy as a function of effectiveness and other external variables*

Figure VI demonstrates the relationship between implementation effectiveness of competition laws and policies, and the final outcome (FDI inflows relative to GDP). The

---

<sup>41</sup> The estimation is based upon only those countries for which both the dependent and the independent variables have non-missing values. Three important sources for potential biases in regression coefficient estimates are omitted variable bias, measurement bias, and endogeneity bias. A relatively high value of the  $R^2$  statistic indicates that omitted variables are not a significant source of variation compared with the variables included in the model. The variables included in the model are relatively straightforward to measure, and are likely exogenous at least when measured on a year to year basis, as they are here. The “reasonable” values of the  $t$  statistics are also consistent with a nonexistent or an insignificant bias due to endogeneity. Additionally, non-uniform variance (heteroscedastic) residuals can result in an efficiency loss. For the model in Table II, a specification Chi-square statistic was computed. The statistically insignificant result of this computation indicated that if no specification errors are present, then the null hypothesis of uniform variance (homoscedastic) residuals cannot be rejected. Moreover, a non-normal distribution of the residual term can render invalid a test of statistical significance (such as the  $t$  test and the  $F$  test). A commonly used statistical test for determining whether the dependent variable is sampled from a normal distribution is the Kolmogorov-Smirnov test. The result of this test indicated that the WEF rating can reasonably be considered normally distributed when the threshold probability value for not accepting normality is 1% or less. Truncation of the left-hand side variable may be a source of non-normal disturbances when the dependent variable is “quasi quantitative,” as the WEF rating. However, a visual inspection of the distribution of the WEF rating does not indicate that the lower and the upper bounds (1 and 7, respectively) are constraints that are binding on the WEF rating. (That is because the WEF rating does not seem to have an abnormally high frequency -- or a mass or an accumulation point -- at or near either of the two bounds.)

horizontal axis is the WEF rating and the vertical axis is the FDI inflows as a percentage of GDP. The straight line represents the best linear fit. A positive relationship is clearly observed. Moreover, there are no apparent diminishing returns.

Figure VII depicts the apparent relationships between the competition policy effectiveness (horizontal axis) and FDI inflows relative to GDP (vertical axis) for the E.U. member or candidate countries versus non-E.U. countries. Each of the two lines describes the relationship between the competition policy effectiveness and the expected level of FDI inflow for either of the two groups of countries.<sup>42</sup> The upper line describes the statistical relationship between competition policy effectiveness and FDI as a percentage of the country's GDP for the E.U. countries. The lower line describes the statistical relationship between competition policy effectiveness and FDI as a percentage of a country's GDP for the non-E.U. countries. The gap between the two lines can be interpreted as the E.U. countries having a higher level of FDI inflows relative to the non-E.U. countries that is independent of the relative effectiveness of competition policies and practices.<sup>43</sup>

Next, the numerical relationship between FDI inflows and the WEF rating was estimated. The dependent variable is FDI relative to total GDP, which implicitly accounts for the effect of market size on FDI inflows (presumed positive). The explanatory variables are the WEF rating, logarithm of the population, a dummy variable indicating E.U. membership (including candidates), and a separate dummy variable for

---

<sup>42</sup> Each of the lines in Figure VII depicts the expected levels of FDI as a percent of GDP for a given WEF rating. The expected levels of FDI relative to GDP have been calculated from the statistical regression coefficients in Table II for the WEF rating and the E.U. membership variables.

<sup>43</sup> This can partly be explained by intra-E.U. FDI flows, which constituted nearly a quarter of all FDI inflows to the E.U.-25 countries during years 2001 through 2004 (source: Eurostat, "Direct investment inward flows by main investing country").

each of Ireland and the U.K. The results are displayed in Table II below. The WEF rating is significant and positive.<sup>44</sup> Its point estimate implies that every unit increase in the WEF rating increases the FDI inflows 1.42 percentage points of the country's GDP.<sup>45</sup> The E.U. variable is positive (1.83) but significant only at the 10% level. The population variable is negative and significant; its point estimate implies that the FDI/income ratio would decrease 0.83 percentage points with every doubling of a country's population.<sup>46</sup> Finally, the variables for Ireland and the U.K. are both positive and significant; this confirms the outlier status of these two countries with respect to the amount of FDI that each received relative to its national income. The  $R^2$  was 0.86, implying that the variables displayed in Table II explained 86% of the variation in FDI inflows relative to countries' national incomes. Tables A.2 and A.3 in the Appendix respectively display the ordinary least squares regression output and the data.<sup>47</sup>

---

<sup>44</sup> The statistical significance of the WEF variable supports the hypothesis that country is the relevant collection of firms (that is, the relevant jurisdiction) when measuring the relationship between competition policy effectiveness (measured by the WEF rating) and competitiveness to attract FDI.

<sup>45</sup> A Hausman-Wu test failed to reject at the 5% level the null hypothesis that the WEF rating is exogenously determined relative to FDI inflows. The instrument set included all the variables displayed in Table I and *recent E.U. member or candidate*. The first-stage  $R^2$  was 0.38 and the first-stage adjusted  $R^2$  was 0.30. The correlation between the predicted and the actual WEF ratings was 0.60.

<sup>46</sup> The difference between the expected levels of effectiveness for a country with a population of  $Z$  and another country with twice the population ( $2Z$ ) can be calculated using the parameter estimate on the second row of Table I as  $-1.2 * [\text{Log}(2Z) - \text{Log}(Z)] = -1.2 * [\text{Log}(2) + \text{Log}(Z) - \text{Log}(Z)] = -1.2 * \text{Log}(2) = -1.2 * 0.69 = -0.83$ .

<sup>47</sup> The estimation is based upon only those countries for which both the dependent and the independent variables have non-missing values. The overall statistical evidence suggests that the relationship between development status and FDI inflows is not especially strong or statistically significant in the sample when the variables in Table II are included. Three important sources for potential biases in regression coefficient estimates are omitted variable bias, measurement bias, and endogeneity bias. A relatively high value of the  $R^2$  statistic usually indicates that omitted variables are not a significant source of variation compared with the variables included in the model. The variables included in the model are relatively straightforward to measure, and are likely exogenous at least when measured on a year-to-year basis, as they are here. The primary variable for which endogeneity may have been an issue is the WEF rating. The endogeneity of the WEF rating was tested; and the test failed to reject at the 5% level the null hypothesis that the WEF rating is exogenously determined relative to FDI inflows. Additionally, heteroscedastic disturbances can result in an efficiency loss. For the model in Table II, a specification Chi-square statistic was computed. The statistically insignificant result of this computation indicated that if no specification errors are present, then the null hypothesis of uniform variance (homoscedastic) residuals cannot be rejected. The high  $t$  statistics of the coefficients are consistent with the absence of multicollinearity as a problem. Moreover, a non-

**Table II: Parameter estimates for the FDI inflow equation (the dependent variable is FDI relative to GDP).**

Model Specification	Variable	Parameter estimate	Standard error	t-stat	Significance level <sup>a</sup>
FDI	WEF rating	1.42	0.51	2.79	0.01
	Logarithm of population	-1.20	0.35	-3.40	0.00
	E.U. member or candidate	1.83	0.97	1.88	0.07
	Ireland	38.31	3.14	12.22	0.00
	U.K.	17.09	3.19	5.36	0.00

<sup>a</sup> Rounded to the next lowest significant digit; e.g. a significance level of 0.0049 (or less) is shown as 0.00.

The difference between an observed and an expected FDI value (the residual) is tentatively interpreted as an “efficacy premium” (in the case of a positive residual) or an “efficacy gap” (in the case of a negative residual). According to this interpretation, countries such as Germany, Japan, Korea, Greece and Turkey should be able to achieve higher FDI inflows (relative to GDP) given their respective WEF ratings. These countries suffer from an efficacy gap that is potentially attributable to relatively ineffective governance in areas other than competition policy.<sup>48</sup> For such a country, competition policy implementation and enforcement can be characterized as “ahead of the times” relative to governance effectiveness in areas other than competition policy.<sup>49</sup> At the other side of the spectrum, countries such as Ireland (an outlier), the U.K., and the Netherlands are performing even better than expected on the basis of their WEF ratings.

---

normal distribution of the residual term can render invalid a test of statistical significance (such as the t test and the F test). The result of a Kolmogorov-Smirnoff test of normality indicated that the FDI variable can reasonably be considered normally distributed when the threshold probability value for not accepting normality is 1% or less.

<sup>48</sup> The estimated link between antitrust effectiveness and FDI inflows will also capture effectiveness of governance in other areas to the extent that antitrust effectiveness is correlated with effective governance in those areas. However, this crossover effect can be expected to be mitigated by the inclusion of the other variables (especially the E.U variable and the population variable) which may partly control for general governance.

<sup>49</sup> At least for some countries an efficacy gap may be related to “politicization of antitrust enforcement.” For example, the heads of the U.S. antitrust agencies are political appointees. This effect may partially be offset by private plaintiffs’ right to sue under the antitrust laws in the United States.

These countries enjoy an efficacy premium that is potentially attributable to relatively effective governance in areas other than competition policy.

## **V. CONCLUSIONS AND POLICY IMPLICATIONS**

Outcome efficacy is ultimately determined by interactions between a country's competition policy and other institutions, contracts, and policies. For example, consider incumbent carriers' refusal to lease excess capacity to a new entrant in mobile telecommunications.<sup>50</sup> Competition authority of the host country might be thinking of enforcement action that would effectively force the incumbent carriers to lease their excess capacity to the entrant on a nondiscriminatory basis. *Ceteris paribus*, a case could be made that such enforcement action may reduce the level, and/or delay the timing, of FDI entry into telecommunications infrastructure. However, if infrastructure competition is contractually mandated by the initial agreement between the entrant and the host government, then this kind of enforcement action can be argued as less likely to reduce or delay FDI entry into infrastructure.<sup>51</sup>

Furthermore, the link between competition policies and outcome efficacy is probably determined at a market level. Specifically, foreign direct investment might be attracted to market power in the market of entry. FDI might also seek competitive conditions in markets that are vertically related to the market of entry. Theoretically, the relative extents of the market power effects in the market of entry and vertically related markets on the investment incentives would depend on the nature of the vertical

---

<sup>50</sup> Turkish Competition Agency actually investigated such a case; in 2003 it decided in favor of the entrant (a consortium with foreign investment participation) and issued fines and injunctive relief. See the chapter on Turkey in CUTS (2006).

<sup>51</sup> In the Turkish competition case mentioned above, the entrant had agreed to build its own infrastructure within five years of entry.

relationships in each specific case. An uneven (or uncertain) distribution of market power across markets and/or market participants may also repel risk-averse potential entrants.

The returns to efficiency are explained largely by the qualitative variables indicating “developed country,” “E.U. member or candidate” and “recent E.U. member or candidate.” Effectiveness gaps between the developing versus the developed countries, and between the recent E.U. members (and candidates) versus other E.U. members may be interpreted as indicating a need for technical support in the design and implementation of competition policies, and a need for increased effectiveness in the enforcement technology, for the developing countries and the recent E.U. members and candidates.

Available statistical evidence supports the proposition that effective implementation of existing laws is also a function of time. As a result, countries such as recent E.U. members and E.U. candidate(s) that are currently placed close to the southeast corner of Figure II can reasonably expect to strengthen implementation effectiveness over time, and thus migrate toward the northeast corner in Figure II. Extra-agency initiatives may accelerate this transformation. Examples of extra-agency initiatives include civil society organizations, ability of private parties to initiate lawsuits under the competition laws, and ability to collect private damages from violators.<sup>52</sup>

The returns to efficacy appear pronounced for the E.U. member countries, especially the U.K. and Ireland, with respect to the rest of the sample; this finding is consistent with at least one previous study on the effects of procompetitive policies in

---

<sup>52</sup> The decision whether to allow private parties to sue under the antitrust laws is at the discretion of each individual country.



Ireland and the U.K. on investment toward innovation.<sup>53</sup> These findings support the relevance of competition laws, policies and implementation for increased welfare in the dynamic sense.<sup>54</sup> Moreover, these findings indicate that in addition to competition policies, efficacy is also a function of binary variables (for example, E.U. membership), which are not always determined on the basis of economic criteria only. Even when an effective competition policy is in place, an efficacy gap may persist as long as economic and other types of conditions preclude such a binary transformation (for example, becoming a member of the E.U.).

Statistical analyses presented above have important policy implications. They suggest that the gaps between the developed and the developing countries cannot be bridged merely by increasing the size of the competition agencies' budgets. Reorganizing agencies' spending priorities as well as developing extra-agency initiatives can be complementary means to bridge these gaps.

Measures of initial competitive conditions in each country are not within the bounds of this study. Analyses presented above may be extended in the future to incorporate such measures.

---

<sup>53</sup> Crampton (2003).

<sup>54</sup> These findings can also be interpreted as supporting the conjecture that investors on average expect an unfavorable and/or uncertain distribution of market power across markets and firms.

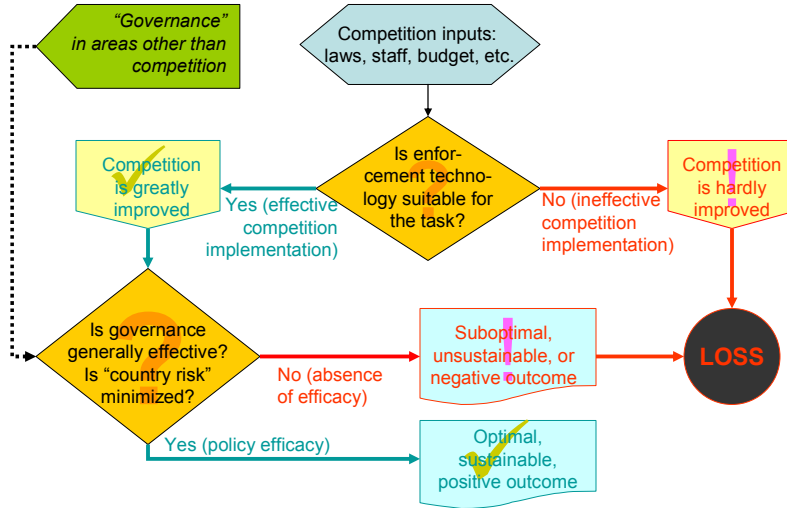
**REFERENCES**

- Banga R. (2003) Impact of Government Policies and Investment Agreements on FDI Inflows. Working Paper 116, Indian Council for Research on International Economic Relations.
- Blonigen, B. A. and M. Wang (2004) "Inappropriate Pooling of Wealthy and Poor Countries in Empirical FDI Studies," NBER Working Paper No. 10378 (<http://www.nber.org/papers/w10378>).
- Charlton, A. (2003) Incentive Bidding for Mobile Investment: Economic Consequences and Potential Responses. OECD Development Centre Working Paper No. 203.
- Crampton, P. (2003) Competition and efficiency as organizing principles for all economic and regulatory policymaking. Latin American Competition Forum Working Paper No. 2.
- CUTS (2006) *Competition Regimes in the World: a Civil Society Report*. Mumbai, India: Consumer Unity & Trust Society (CUTS).
- CUTS—C-CIER (2005) "Foreign direct investment and competition policy," *Briefing Paper* No. 2/2005.
- Dahl, J. (2002) Incentives for Foreign Direct Investment - The Case of SADC in the 1990s. Namibian Economic Policy Research Unit (NEPRU) Working Paper 8.
- Dutz, M. A. and M. Vagliasindi (2000) "Competition Policy Implementation in Transition Economies: An Empirical Assessment," *European Economic Review* **44**(4-6): 762-772.
- Dutz, M. A. and M. Vagliasindi (1999) Competition Policy Implementation in Transition Economies: An Empirical Assessment. European Bank for Reconstruction and Development Working Paper No. 47.
- Evenett, S. J. (2002) How Much Have Merger Review Laws Reduced Cross Mergers and Acquisitions? Mimeo, World Trade Institute.
- Fingleton, J., E. Fox, D. Neven, and P. Seabright (1998) *Competition Policy and the Transformation of Central Europe*. London: Centre for Economic Policy Research.
- FitzGerald, V. (2002) Regulatory Investment Incentives. QEH Working Paper Series No. 80. Revised version of paper DAFPE/IME/RD (2001) 24 commissioned by the OECD Department of Financial, Fiscal and Enterprise Affairs for the Committee on International Investment and Multinational Enterprises.
- Ginarte, Juan Carlos and Walter G. Park (1997) "Determinants of Patent Rights: A Cross-National Study," *Research Policy* **26**: 283-301.
- Global Competition Forum Internet website (<http://www.globalcompetitionforum.org/>)
- Goldberg, L. S. (2004) "Financial-Sector Foreign Direct Investment and Host Countries: New and Old Lessons," FRB of New York Staff Report No. 183.

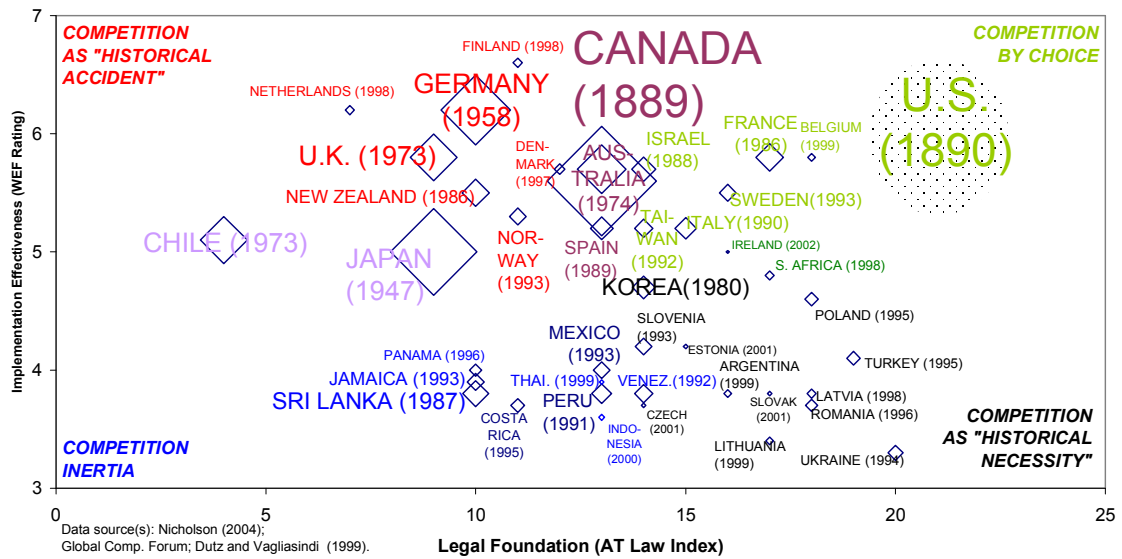
- Graham, E. M. and J. D. Richardson, eds. (1997) *Global Competition Policy*. Washington, DC: Institute for International Economics.
- Hoekman, B. (1997) "Focal Points and Multilateral Negotiations on the Contestability of Markets," in K. E. Maskus, et al., eds., *Robert M. Stern and His International Economic Legacy*. Ann Arbor: University of Michigan Press.
- Inal, A. G. (2003) A Study into Competitiveness Indicators. REF Report, Istanbul. (<http://ref.advancity.net/En/Moduller/Makaleler/MakaleForm.aspx?KodAl=0&mdId=184>)
- International Competition Network Internet website (<http://www.internationalcompetitionnetwork.org/>)
- Jenny, F. (1995) "Competition and Efficiency," in B. Hawk, ed., *International Antitrust Law & Policy: Annual Proceedings of the Fordham Corporate Law Institute*.
- Kee, H. L. and B. Hoekman (2003) Imports, Entry, and Competition Law as Market Disciplines. CEPR Discussion Paper No. 3777.
- Khemani, R. S. (2003) Some Perspectives on Competition Policy for Developing Economies. Speaking Notes for the Second Annual Meeting of the International Competition Network.
- Lapachi, K. (2002) "An Examination of the Present Competition Law of Georgia Using Pittman's Criteria," *Antitrust Bulletin* 47(1): 187-215.
- Maskus, K. E. (2000) Intellectual Property Rights and Foreign Direct Investment. University of Adelaide Centre for International Economic Studies Policy Discussion Paper No, 0022.
- Mehta, P. S. and S. J. Evenett (2006) "Promoting Competition Around the World: A Diversity of Rationales and Approaches," in CUTS (2006).
- Neven, D. J. and G. Siotis (1993) Foreign Direct Investment in the European Community: Some Policy Issues. C.E.P.R. Discussion Paper No 798.
- Nicholson, M. W. (2004) Quantifying Antitrust Regimes. Mimeo. U.S. Federal Trade Commission.
- Noland, M. (1999) Competition Policy and FDI: A Solution in Search of a Problem? Institute for International Economics Working Paper 99-3.
- OECD (1997) *Technology and the economy: The key relationships*. Paris: Organization for Economic Co-operation and Development.
- OECD (2002) The Economics of International Investment Incentives. Article prepared by Professor Magnus Blomström, Stockholm School of Economics, NBER and CEPR.
- OECD (2003) *Incentives-Based Competition for FDI in Developing Countries. Findings of a joint WAIPA/OECD questionnaire*. Paris: Directorate for Financial, Fiscal and Enterprise Affairs.

- Pittman, R. (1998) "Competition Law in Central and Eastern Europe: Five Years Later," *Antitrust Bulletin* 43(1): 179-228.
- Rapp, Richard and Richard Rozek (1990) "Benefits and Costs of Intellectual Property Protection in Developing Countries," *Journal of World Trade* 24: 75-102.
- Sader, F. (1993) Privatization and Foreign Investment in the Developing World, 1988-92. World Bank Policy Research Working Paper WPS 1202.
- Sader, F. (1995) Attracting Foreign Direct Investment into Infrastructure: Why Is It So Difficult? Foreign Investment Advisory Service Occasional Paper 12.
- Singh H. and K. W. Jun (1995) Some New Evidence on Determinants of Foreign Direct Investment in Developing Countries. World Bank Policy Research Working Paper WPS 1531.
- Turkish Competition Authority (2004) *Year 2003 Operational Report* (in Turkish). Ankara.
- Waldkirch, A. (2003) Vertical FDI? A Host Country Perspective. Mimeo. Oregon State University.
- Wallensten S. (1999) An Empirical Analysis of Competition, Privatization and Regulation in Telecommunications Markets in Africa and Latin America. World Bank Policy Research Working Paper No. 2136.
- World Bank (2004) *World Development Indicators CD-ROM*. Washington, D.C.: International Bank for Reconstruction and Development.

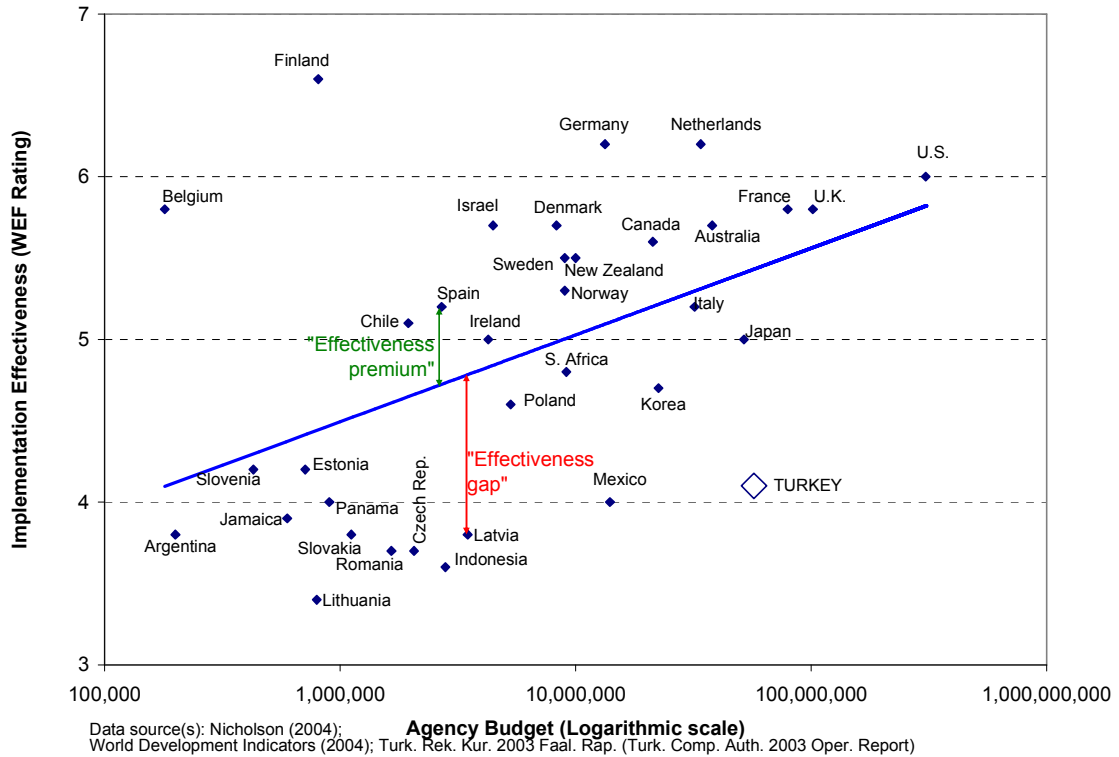
**Figure I: Ex-post policy evaluation framework: a schematic demonstration.**



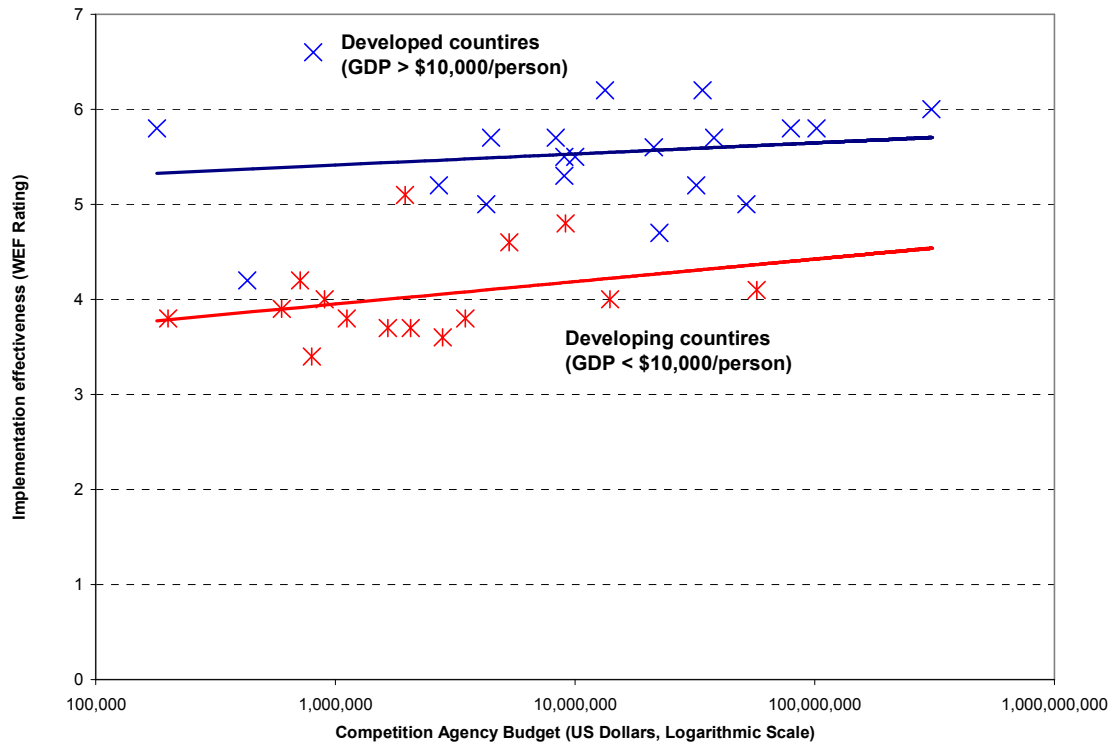
**Figure II: Four corners of the international antitrust landscape, in three dimensions**



**Figure III: Effectiveness as a function of budget**



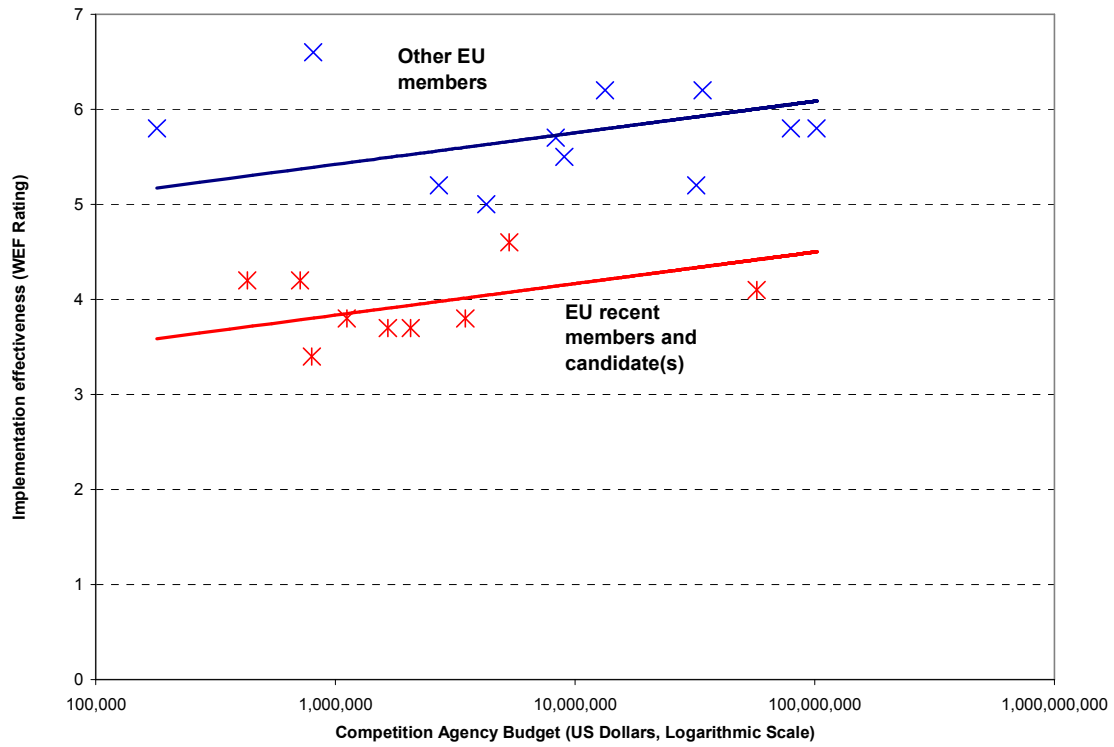
**Figure IV: Effectiveness gap: developed countries vs. other countries.**



Data source: Nicholson (2004)

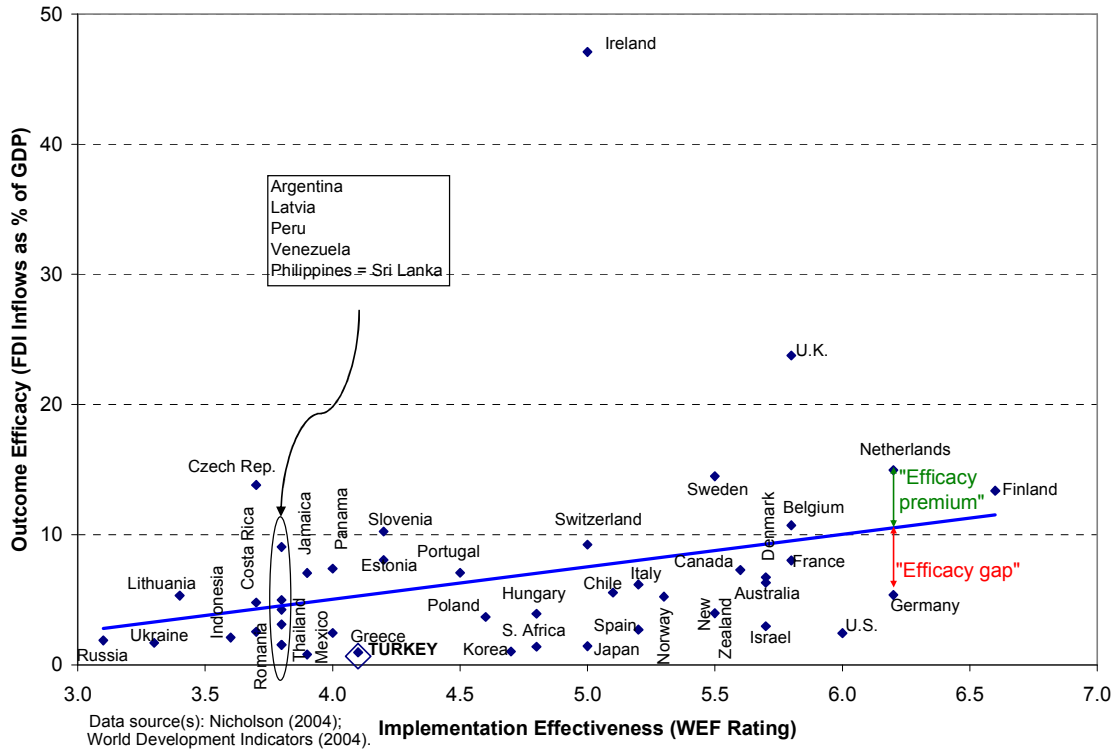


**Figure V: Effectiveness gap: recent E.U. members and E.U. candidate(s) vs. other E.U. members**

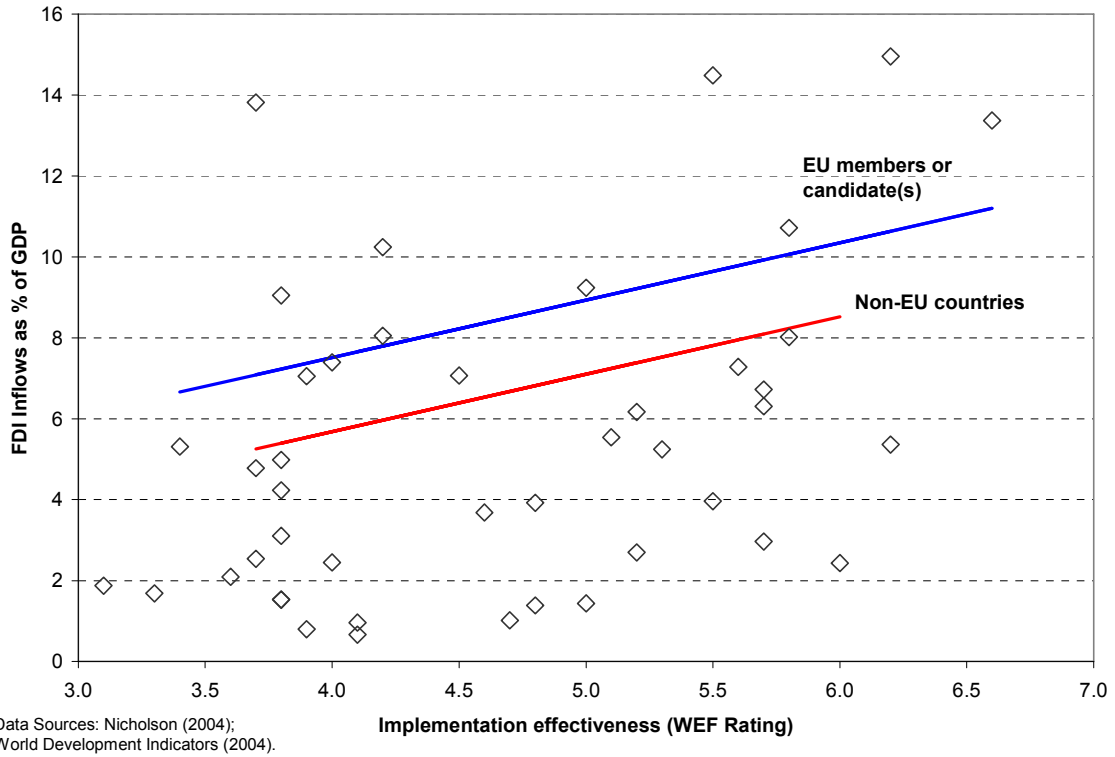


Data source: Nicholson (2004)

**Figure VI: Efficacy as a function of effectiveness**



**Figure VII: Efficacy gap: E.U. members and candidate(s) vs. other countries**



**Note: Excludes outliers Ireland and U.K.**

**Appendix**

**Table A.1: Ordinary Least Squares estimation of the effect of an increase in the agency budget and staff size on antitrust implementation effectiveness (measured by the WEF rating)**

Dependent Variable = WEF rating

The SAS System 17:11 Saturday, June 3, 2006 18

The REG Procedure

Descriptive Statistics

Variable	Sum	Mean	Uncorrected SS	Variance	Standard Deviation
Intercept	35.00000	1.00000	35.00000	0	0
LogBudget	543.62698	15.53220	8559.27673	3.39865	1.84354
staff_NI	21.78930	0.62255	29.78163	0.47696	0.69062
WEF	171.20000	4.89143	865.68000	0.83139	0.91181
EU	20.00000	0.57143	20.00000	0.25210	0.50210
New2EU_Candidate	9.00000	0.25714	9.00000	0.19664	0.44344
DC	20.00000	0.57143	20.00000	0.25210	0.50210
LogYears	85.54067	2.44402	241.84958	0.96431	0.98199

Descriptive Statistics

Variable	Label
Intercept	Intercept
LogBudget	
staff_NI	
WEF	WEF
EU	EU
New2EU_Candidate	New2EU_Candidate
DC	
LogYears	

Correlation

Variable	Label	LogBudget	staff_NI	WEF	EU
LogBudget		1.0000	-0.3186	0.4687	-0.1286
staff_NI		-0.3186	1.0000	-0.4180	0.1862
WEF	WEF	0.4687	-0.4180	1.0000	0.0431
EU	EU	-0.1286	0.1862	0.0431	1.0000
New2EU_Candidate	New2EU_Candidate	-0.3083	0.5833	-0.6200	0.5095
DC		0.4355	-0.3938	0.8269	0.0667
LogYears		0.5956	-0.3216	0.5496	-0.3937

Correlation

Variable	Label	New2EU_Candidate	DC	LogYears
LogBudget		-0.3083	0.4355	0.5956
staff_NI		0.5833	-0.3938	-0.3216

The SAS System 17:11 Saturday, June 3, 2006 19

The REG Procedure

Correlation

Variable	Label	New2EU_Candidate	DC	LogYears
WEF	WEF	-0.6200	0.8269	0.5496
EU	EU	0.5095	0.0667	-0.3937
New2EU_Candidate	New2EU_Candidate	1.0000	-0.5473	-0.4341
DC		-0.5473	1.0000	0.5006
LogYears		-0.4341	0.5006	1.0000

The SAS System 17:11 Saturday, June 3, 2006 20

The REG Procedure

Model: MODEL1  
Dependent Variable: WEF WEF

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	2	8.48032	4.24016	6.86	0.0033
Error	32	19.78710	0.61835		
Corrected Total	34	28.26743			

Root MSE	0.78635	R-Square	0.3000
Dependent Mean	4.89143	Adj R-Sq	0.2563
Coeff Var	16.07609		

Parameter Estimates

Variable	Label	DF	Parameter Estimate	Standard Error	t Value	Pr >  t
Intercept	Intercept	1	2.26893	1.25253	1.81	0.0795
LogBudget		1	0.18467	0.07717	2.39	0.0228
staff_NI		1	-0.39486	0.20600	-1.92	0.0642

The SAS System

17:11 Saturday, June 3, 2006 21

The REG Procedure

Model: MODEL2

Dependent Variable: WEF WEF

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	5	21.65575	4.33115	19.00	<.0001
Error	29	6.61168	0.22799		
Corrected Total	34	28.26743			

Root MSE	0.47748	R-Square	0.7661
Dependent Mean	4.89143	Adj R-Sq	0.7258
Coeff Var	9.76160		

Parameter Estimates

Variable	Label	DF	Parameter Estimate	Standard Error	t Value	Pr >  t
Intercept	Intercept	1	3.12514	0.79338	3.94	0.0005
LogBudget		1	0.07497	0.05092	1.47	0.1517
staff_NI		1	0.06102	0.15026	0.41	0.6877
EU	EU	1	0.43831	0.22103	1.98	0.0569
New2EU_Candidate	New2EU_Candidate	1	-0.89705	0.32719	-2.74	0.0104
DC		1	0.95203	0.23845	3.99	0.0004

The SAS System

17:11 Saturday, June 3, 2006 22

The REG Procedure

Model: MODEL3

Dependent Variable: WEF WEF

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	6	22.55906	3.75984	18.44	<.0001
Error	28	5.70837	0.20387		
Corrected Total	34	28.26743			

Root MSE	0.45152	R-Square	0.7981
Dependent Mean	4.89143	Adj R-Sq	0.7548
Coeff Var	9.23084		

Parameter Estimates

Variable	Label	DF	Parameter Estimate	Standard Error	t Value	Pr >  t
Intercept	Intercept	1	3.32277	0.75610	4.39	0.0001
LogBudget		1	0.02336	0.05404	0.43	0.6688
staff_NI		1	0.07911	0.14235	0.56	0.5828
EU	EU	1	0.66960	0.23613	2.84	0.0084
New2EU_Candidate	New2EU_Candidate	1	-1.00939	0.31397	-3.21	0.0033
DC		1	0.72703	0.24954	2.91	0.0069
LogYears		1	0.25289	0.12014	2.10	0.0444

**Table A.2: Ordinary Least Squares estimation of the effect of antitrust implementation effectiveness (measured by the WEF rating) on FDI inflows**

Dependent Variable = Gross foreign direct investment (% of GDP)

The SAS System

17:11 Saturday, June 3, 2006 16

The REG Procedure

Descriptive Statistics

Variable	Sum	Mean	Uncorrected SS	Variance	Standard Deviation	Label
Intercept	46.00000	1.00000	46.00000	0	0	Intercept
WEF	215.00000	4.67391	1043.50000	0.85797	0.92627	WEF
IE	1.00000	0.02174	1.00000	0.02174	0.14744	
EU	22.00000	0.47826	22.00000	0.25507	0.50505	EU
UK	1.00000	0.02174	1.00000	0.02174	0.14744	
LogPop	114.88514	2.49750	370.07074	1.84766	1.35929	
GrsFDI	308.93737	6.71603	4723.14903	58.85148	7.67147	

Correlation

Variable	Label	WEF	IE	EU
WEF	WEF	1.0000	0.0531	0.2505
IE		0.0531	1.0000	0.1557
EU	EU	0.2505	0.1557	1.0000
UK		0.1832	-0.0222	0.1557
LogPop		0.0044	-0.1701	-0.2528
GrsFDI		0.3004	0.7931	0.3833

Correlation

Variable	Label	UK	LogPop	GrsFDI
WEF	WEF	0.1832	0.0044	0.3004
IE		-0.0222	-0.1701	0.7931
EU	EU	0.1557	-0.2528	0.3833
UK		1.0000	0.1284	0.3350
LogPop		0.1284	1.0000	-0.3253
GrsFDI		0.3350	-0.3253	1.0000

The SAS System

17:11 Saturday, June 3, 2006 17

The REG Procedure

Model: MODEL1

Dependent Variable: GrsFDI

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	5	2280.29179	456.05836	49.57	<.0001
Error	40	368.02472	9.20062		
Corrected Total	45	2648.31651			

Root MSE	3.03325	R-Square	0.8610
Dependent Mean	6.71603	Adj R-Sq	0.8437
Coeff Var	45.16436		

Parameter Estimates

Variable	Label	DF	Parameter Estimate	Standard Error	t Value	Pr >  t
Intercept	Intercept	1	0.97744	2.51473	0.39	0.6996
WEF	WEF	1	1.42308	0.51085	2.79	0.0081
IE		1	38.31387	3.13629	12.22	<.0001
EU	EU	1	1.83385	0.97627	1.88	0.0676
UK		1	17.08604	3.18652	5.36	<.0001
LogPop		1	-1.19886	0.35271	-3.40	0.0015



**Table A.3: Regression Data**

Country	WE F	E U	New2EU_ Candidate	GrsFDI	LogBudget	staff_NI	D C	LogYear s	LogPo p
Argentina	3.8	0	0	9.0487	12.2061	0.0575	0	1.6094	3.1733
Australia	5.7	0	0	6.3088 10.717	17.4531	0.8180	1	3.4012	2.5806
Belgium	5.8	1	0	8	12.1007	0.0778	1	1.6094	1.9202
Canada	5.6	0	0	7.2810	16.8742	0.3937	1	4.7449	3.0696
Chile	5.1	0	0	5.5403	14.4833	0.2787	0	3.4340	2.3182
Costa Rica	3.7	0	0	4.7772 13.816			0	2.1972	0.9187
Czech Republic	3.7	1	1	0	14.5381	0.8215	0	1.0986	1.9746
Denmark	5.7	1	0	6.7200	15.9318	0.4245	1	1.9459	1.2734
Estonia	4.2	1	1	8.0506 13.366	13.4747	2.9996	0	1.0986	0.0769
Finland	6.6	1	0	6	13.6016	0.3381	1	2.7726	1.2470
France	5.8	1	0	8.0173	18.1913	0.2014	1	2.8904	3.6562
Germany	6.2	1	0	5.3640	16.4052	0.0720	1	3.8286	4.0255
Greece	4.1	1	0	0.9609			1	3.2581	1.9955
Hungary	4.8	1	1	3.9235			0	2.0794	1.9413
Indonesia	3.6	0	0	2.0914 47.085	14.8451	0.1511	0	1.3863	4.9299
Ireland	5	1	0	4	15.2648	0.3561	1	0.6931	0.9636
Israel	5.7	0	0	2.9632	15.3105	0.6565	1	2.7726	1.4107
Italy	5.2	1	0	2.6975	17.2812	0.0851	1	2.6391	3.6558
Jamaica	3.9	0	0	7.0514	13.2980	0.6664	0	2.3979	0.5020
Japan	5	0	0	1.4340	17.7648	0.1871	1	4.0431	4.4521
Korea, Rep.	4.7	0	0	1.0183	16.9290	0.5842	1	3.1781	3.5296
Latvia	3.8	1	1	4.9813	15.0625	1.3886	0	1.7918	0.4769
Lithuania	3.4	1	1	5.3141	13.5881	1.8987	0	1.6094	0.8557
Mexico	4	0	0	2.4469 14.951	16.4546	0.1759	0	2.3979	4.1348
Netherlands	6.2	1	0	8	17.3419	0.3597	1	1.7918	2.3889
New Zealand	5.5	0	0	3.9611	16.1181	1.1289	1	2.8904	0.9578
Norway	5.3	0	0	5.2397	16.0127	0.6062	1	2.3979	1.0838
Panama	4	0	0	7.3968	13.7102	1.0634	0	2.0794	0.6291
Peru	3.8	0	0	4.2308			0	2.5649	2.8180
Philippines	3.8	0	0	1.5342			0	2.8332	3.8603
Poland	4.6	1	1	3.6805	15.4838	0.6569	0	2.1972	3.2883
Portugal	4.5	1	0	7.0679			1	2.3979	1.9263
Romania	3.7	1	1	2.5356	14.3179	2.6588	0	2.0794	2.7348
Russian Federation	3.1	0	0	1.8757			0	2.5649	4.6173
Slovak Republic	3.8	1	1	10.239	13.9247	0.9204	0	1.0986	1.3255
Slovenia	4.2	1	1	0	12.9682	0.3234	1	2.3979	0.3315
South Africa	4.8	0	0	1.3838	16.0273	0.2346	0	1.7918	3.3389
Spain	5.2	1	0	6.1707	14.8088	0.1161	1	2.7081	3.3253
Sri Lanka	3.8	0	0	1.5269			0	2.8332	2.5511
Sweden	5.5	1	0	14.485	16.0127	0.4439	1	2.3979	1.7532

*Draft Paper for Comments*

				6					
Switzerland	5	0	0	9.2384			1	2.1972	1.5937
Taiwan	5.2	0	0				0	2.4849	
Thailand	3.9	0	0	0.7953			0	1.6094	3.7669
Turkey	4.1	1	1	0.6604	17.8622	0.0084	0	2.1972	3.8220
Ukraine	3.3	0	0	1.6829			0	2.3026	3.5119
				23.768					
United Kingdom	5.8	1	0	8	18.4374	0.4951	1	3.4340	3.6555
United States	6	0	0	2.4305	19.5424	0.1409	1	4.7362	5.2512
Venezuela, RB	3.8	0	0	3.1047			0	2.4849	2.7510