

Rethinking Green Versus Conventional Investment Flows in BRIC+ Countries: Review of Emerging Trends and a Model For Future Research

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Abstract

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The article explores the emerging trends and future potential for diverting capital flows from conventional to green activities in Brazil, Russia, India, China, Mexico, and South Africa (BRIC+ countries). At present, Chinese and Indian investors fund both environmentally unfriendly and green projects at a speedy pace, given these two countries' high rates of gross fixed capital formation and general independence from external financial markets. By contrast, in Mexico, in South Africa, and especially in Brazil and Russia, environmentally sensitive projects to a considerable extent raise funds in the form of foreign loans. Meanwhile, in all BRIC+ countries except Russia, the bulk of green investment comes from domestic sources of funding.

While recognizing the accomplishments of the previous research on the subject, the article identifies deficiencies in the available data. The author uses generalizations of evidence from case studies to propose a model for future econometric testing. It is hypothesized that 1) the longer the time horizon of the investment institution is, the sounder the environmental profile of its investments; 2) the more stringent and predictable the environmental regulations in host economies are, the longer the investor's time horizon is; 3) financial institutions with open and publicly accountable ownership structure have a longer-term orientation than those with closed and opaque ownership; 4) investors' interest and expertise in diversification beyond environmentally unfriendly industries extend their time horizon.

Rethinking Green Versus Conventional Investment Flows in BRIC+ Countries: Review of Emerging Trends and a Model for Future Research

The single most important determinant of tomorrow's global environmental footprint is today's investment in both the private and public sectors. At this very moment, as the center of gravity in the universe of investment and economic growth is shifting toward BRIC+ countries (Brazil, Russia, India, China, Mexico, and South Africa),¹ we are faced with a unique opportunity: the opportunity to analyze and attempt to redirect capital flows from conventional high-carbon and high-pollution development patterns toward green infrastructure while these rapidly developing economies are still at the early stages of investing in long cycle assets.²

Introduction

The current green investing effort is still dwarfed by the massive flow of capital into extracting and polluting activities.³ On a global scale, investments in the new renewable energy capacity⁴ amounted to only about one third of capital flows into the upstream sector of the oil and gas industry in 2009.⁵ Similarly, the climate finance to be distributed

¹ The acronym BRIC was first coined and prominently used by Goldman Sachs in 2003 in its Global Economics

Paper No. 99 titled "Dreaming with BRICs." The paper argued that, since they are developing so rapidly, by 2050 the combined economies of Brazil, Russia, India, and China could overtake the combined economies of the current richest countries of the world. In this article, a broader notion of BRIC+ includes two additional significant emerging market economies: Mexico and South Africa, which have been selected as venues of the Conferences of the Parties to the UN Framework Convention on Climate Change at the end of 2010 and 2011 respectively.

² Monetary figures throughout this paper are in US\$ unless otherwise noted.

³ This paper uses an approximated classification of all investments as *green* (investments into activities assisting in the prevention, mitigation, reversion or offset of negative impacts on the environment) and *conventional* (all other investments, that is, those following the business-as-usual pattern). Some of the conventional investments have a significant, direct environmental footprint and are referred to as *environmentally unfriendly* (for example, in the fossil fuel extraction, mining, pulp and paper, petrochemistry, and other sectors). Other types of conventional investments may have no considerable direct environmental footprint, but their indirect environmental footprint throughout the value chain may still be substantial. For example, financial institutions usually have small direct impacts on the environment, but may be investing in polluting industries.

⁴ 2009 estimates include \$115 billion in the U.S. (IEA 2010: 283) and \$162 billion (UNEP 2010: 5) worldwide.

⁵ 2009 estimates include \$360 billion (Gismatullin, November 11, 2010) and \$430 billion (based on IEA 2010: 101) worldwide.

through the UN Green Climate Fund launched in December 2010⁶ is eclipsed by the existing global fossil-fuel subsidies.⁷

Lower profitability and hence longer payback periods are investors' most common justifications for favoring conventional investment targets over green projects. But these reasons do not explain the fact that some investors venture into the green economy while others do not. This issue, which is interesting in itself and is one of the central topics of this article, becomes increasingly important as we face the incipient shift of investment decision-making processes to BRIC+ countries.

Both conservationists and politicians have concerns regarding this realignment of investment forces given the controversial socio-environmental record of resource companies from BRIC+ economies, domestically and internationally. For instance, in 2006 Paul Wolfowitz, then President of the World Bank, accused China of ignoring universal human rights and environmental standards when setting up loan portfolios in Africa (*Les Echos*, October 24, 2006). Concerns about massive carbon-intensive investments by BRIC+ countries have also contributed to disputes over ideas about common but shared responsibilities of developed and developing economies with regard to the post-Kyoto international regime of climate change mitigation.

This article seeks to identify and analyze the drivers behind BRIC+ countries' investments in environmentally sensitive projects, both domestically and internationally, with the purpose of formulating recommendations for policy measures and further research in the area of diverting capital flows from conventional to green sectors of emerging economies. Given the deficiencies of the available data, the article is limited to simple quantitative analysis of general investment trends in BRIC+ economies and the proposal of a model for future econometric testing based on the generalization of evidence gathered by previous case studies.

The rest of the article is structured as follows. The second section discusses the existing theoretical approaches to the linkage between investment and its environmental footprint, as well as the existing data limitations. Study of the available data in the third and fourth sections reveals an increasing interpenetration of capital flows between developed and BRIC+ countries, as well as within BRIC+ economies.

In the fifth section, the author uses evidence from case studies to propose a model explaining the choices between green versus conventional investment projects made by

⁶ \$30 billion by 2012 and \$100 billion per year starting 2020 (Efsthathiou, December, 11 2010).

⁷ Global fossil-fuel consumption subsidies were estimated at \$312 billion in 2009 (IEA, 2010). Producer subsidies are also significant in many countries.

financial institutions from BRIC+ countries and other countries. It is hypothesized that: 1) the longer the time horizon of the investment institution is, the sounder the environmental profile of its investments; 2) the more stringent and predictable the environmental regulations in the home and host economies are, the longer the investor's time horizon is; 3) financial institutions with open and publicly accountable ownership structure have a longer-term orientation than those with closed and opaque ownership; 4) investors' interest and expertise in diversification beyond environmentally unfriendly industries contribute to their longer time horizons.

The author concludes with recommendations for policy measures and research, which include: improving the machinery to enforce environmental regulations that the governments should make more transparent, predictable, and flexible, thus encouraging environmental information disclosure and analysis by investors; and strengthening investment cooperation between financial institutions from developed countries and BRIC+ economies.

Accomplishments and Shortcomings of the Existing Theoretical Approaches and Data

Research on the environmental profile of investments started in the period of the late 1970s to the early 1980s, and originally focused on evidence of environmental dumping from developed to developing countries. Incipient studies on the subject explained differences in the environmental performance of various companies (of the same industry and comparable in size) predominantly by variability of external factors. The research identified government regulations as the major factor of businesses' environmental practices and led to the origination of influential, albeit conflicting, hypotheses.

The pollution haven hypothesis suggests that strict environmental regulations are a barrier to international investments, which like water, flow down to the lowest level; in this case, to the lowest environmental standards. While some evidence from case studies supports this hypothesis, more comprehensive empirical research has shown that environmental regulations are far less important for choosing an investment destination than many other factors, such as labor cost, taxation system, or surrounding business infrastructure (OECD 2001: 10). By contrast, the Porter hypothesis, formulated by business strategist Michael Porter, maintains that strict but flexible environmental regulations contribute to competitiveness of both nations and individual companies by stimulating innovation and

cost-efficiency; therefore higher environmental standards may attract investments (Porter 1991).⁸

Gradually, other determinants of companies' environmental performance have been introduced to the research agenda (Reinhardt 2000; Gunningham et al. 2003; Vogel 2005). Among external factors such hypothesized determinants include, first of all, environmental demands of the consumers and the civil society as well as prices of natural resources, especially energy. Availability of environmentally friendly technologies is also an important determinant, although this can be both an external and an internal factor for an individual firm. Among internal factors, sound managerial practices and strategic corporate vision have been identified as important contributors to the corporate environmental performance.

However, scholars "still know little about why individual corporations behave the way they do in the environmental context" (Gunningham et al. 2003: 135). One of the reasons for this shortcoming is that there are gaps in methodologies of measuring environmental performance itself. Neither compliance or overcompliance of companies with technical ecological standards nor the scale of funds spent for environmental management purposes provides a comprehensive framework for cross-industry comparisons of firms of different sizes with various operational processes, location of industrial sites, business approaches, and information disclosure policies.

Therefore stakeholders, who require this type of information, in particular investors and civil society organizations, have been making broad use of voluntary benchmarking standards, scorecards, ratings, and rankings based on self-assessment questionnaires circulated among companies. Alternatively, these corporate profile questionnaires, scorecards, and reports may be filled in or verified by independent experts. For instance, the Carbon Disclosure Project and the Global Reporting Initiative are voluntary corporate benchmarking schemes that help investors assess the environmental profile of companies. Various ratings and rankings, such as the Dow Jones Sustainability Index, FTSE KLD family of sustainability indices, Global 100, and Newsweek's Green Rankings, also serve the purpose of comparing environmental profiles of corporations across different industries.

⁸ For example, as a result of their increasingly greener domestic policies, China, Brazil, and India attracted \$33.7 billion, \$7.8 billion, and \$2.7 billion respectively in investment into the new renewable energy capacity in 2009, or 37 percent of the global investment into the sector by financial institutions (UNEP, 2010). In 2008–2010 a number of countries, most prominently China, resorted to green stimulus as a measure of both economic recovery and improving national competitiveness. See the discussion in the third section of the paper, Who Is Funding Activities that Increase and Reduce the Environmental Footprint of BRIC+ Countries?

Nevertheless, while numerous initiatives in the area of environmental reporting and ratings undoubtedly play an important role in encouraging greener competition among companies, they have yet to mature to provide fully reliable metrics for measuring corporate environmental performance. Collecting quality data on environmental performance is expensive, and investors and other stakeholders have yet exhibited only limited willingness to pay for it. Further, companies may consider some of the information related to their environmental performance proprietary. Moreover, there is a considerable gap between the corporate decision-making process as a subject of environmentally related evaluations, on the one hand, and the actual impacts of a company on the environment, on the other (broad externalities that may require further research). As a compromise, the methodologies used by evaluators at present are often based on ticking “yes” or “no” boxes and may leave room for subjective judgments (Chatterji and Levine 2006). If companies fail to understand the environmental risks they face or the impacts they have, their answers to the questionnaire may be meaningless. Besides, the voluntary nature of the evaluation initiatives implies a selection bias, since most participating companies have already focused on greener practices as a possible competitive advantage. Conversely, environmentally unfriendly companies may evade external assessments. Some analysts also voice concerns about the independence of environmental ratings from influential companies that are subject to their evaluations. “Poor performers have incentives to invent and adopt unreliable, invalid, and non-comparable standards because stakeholders will find it difficult to differentiate which standards are valid... each additional certification and corresponding acronym can actually decrease overall welfare, even while increasing the amount of measurement (and resulting costs)” (Chatterji and Levine 2006: 31). An obvious example in this respect is the oil pollution debacle caused by BP’s exploration activities in the Gulf of Mexico in spring 2010; prior to this incident BP had been ranking high in most of the sustainability indices.

Meanwhile, it is not only the direct environmental impact of companies that is of interest in this respect, but also their indirect ecological footprint. While the direct environmental impact of financial institutions is often insignificant, their indirect ecological footprint, that is the environmental impact of the projects they invest in or provide loans to, can be vast (Kolk et al. 2001). Investment institutions have, to a great extent, driven this research agenda. Since the late 1990s, development banks such as the World Bank Group, European Bank for Reconstruction and Development, KfW, and then networks of private financial institutions such as the UN Finance Initiative, UN Principles for Responsible Investment, Equator Principles Financial Institutions, Coalition for Environmentally Responsible Economies (CERES), and some others have started developing tools for assessing and managing risks related to their indirect environmental impact. In particular, a few scoping studies have outlined possible methodologies for measuring indirect carbon footprints for different type of institutional investors (WRI 2009; SAM 2009).

As a result, the knowledge about environmental impact of investments is being built bottom-up, from intuitive and qualitative hypotheses, case studies, and the application of proposed methodologies to individual investors' portfolios, to more general case studies that are industry-wide (Trucost 2009) or market-wide (measuring the carbon footprint of all companies included into Standards & Poor's 500 and FTSE100 indices). It is also noteworthy that there is generally a considerable lag between disbursement of the investments and their environmental outcomes, which makes ex-post analysis more reliable than real time assessments or projections.

Measurement of the environmental impact of investments at a national level is a much more complex task than estimating the ecological impact of an individual financial institution or a group of them. First, national investments take different forms, and while officially reported information about direct investment flows across BRIC+ countries is relatively consistent and transparent, loans and portfolio investments are characterized by much higher degrees of complication and opacity due to a large number of financial intermediaries involved and deficiencies in the disclosure of information. Second, official information on national accounts often misrepresents the actual distribution of capital flows.⁹ The reason for omissions in the official statistics is that cross-boundary loans, as well as mergers and acquisitions between any two economies, often involve capital transactions via third countries, especially offshore zones.

Furthermore, official national statistics do not single out investments into green or environmentally unfriendly activities, therefore data have to be aggregated through consolidation of announcements on individual projects related to modernization and energy efficiency, waste and water treatment, nature rehabilitation, and other relevant activities – an idea already pursued by the Bloomberg New Energy Finance initiative in the segment of renewables and energy efficiency.

Researchers have therefore attempted to fathom the environmental impact of investment flows in BRIC+ and other emerging economies by way of case studies. The initial focus has been on the role of inward foreign direct investment (FDI) flows for sustainable development (OECD 1999; Mabey and McNally 1999; UNCTAD 2000; Gallagher and Zarsky 2007). More recently, several reports commissioned by WWF investigated the environmental impact of BRIC+ economies' outward investment flows (for example,

⁹ For instance, the Russian State Statistical Service estimated the stock of Chinese direct investment in Russia at the end of 2009 at \$939 million, while the Chinese Ministry of Commerce reported it at \$2024 million, and expert estimates put it at \$5 billion. Furthermore, when reporting total cross-boundary capital flows, the Russian State Statistical Service does not include data on bodies of monetary regulation, commercial and savings banks, which account for the major share of the stock of Chinese investments in Russia (Simonov et al. 2010: 166–167).

Pamlin and Baijin 2007; Gerasimchuk 2009). With partial success, one of these studies for Russia has attempted to extend the scope of the analysis beyond direct investment to loans and their impact on the country's environment (Gerasimchuk et al. 2010).

A number of studies have also specifically focused on the determinants of China's outward investment flows. Using UNCTAD and World Bank datasets on host economies receiving China's outward direct investment prior to 2007, some researchers concluded, by way of econometric analysis, that China's direct investment is attracted by countries with vast natural resources and poor institutions (Buckley et al. 2007; Kolstad and Wiig 2009). However, analysis of more recent data, including not only direct but also other types of investment, rebuts this conclusion. For 2005–2009, the top six destinations of Chinese outward non-bond investment included not only Iran, Kazakhstan, and Democratic Republic of Congo, but also Australia, the U.S., and the U.K. Meanwhile, there are still serious data discrepancies between, for example, China's Ministry of Commerce and the Heritage Foundation (Scissors 2009). This example demonstrates that the situation in BRIC+ countries develops dynamically and more data are needed for solid econometric analysis of the subject matter of this article. A longer timeline of observations and more transparency on capital flows are required.

The task of consolidating comparable data on investment flows in BRIC+ countries and the measurement of the environmental footprint of these flows is beyond the scope of this article, but is essential for future econometric testing of the hypotheses based on evidence from case studies and presented below.

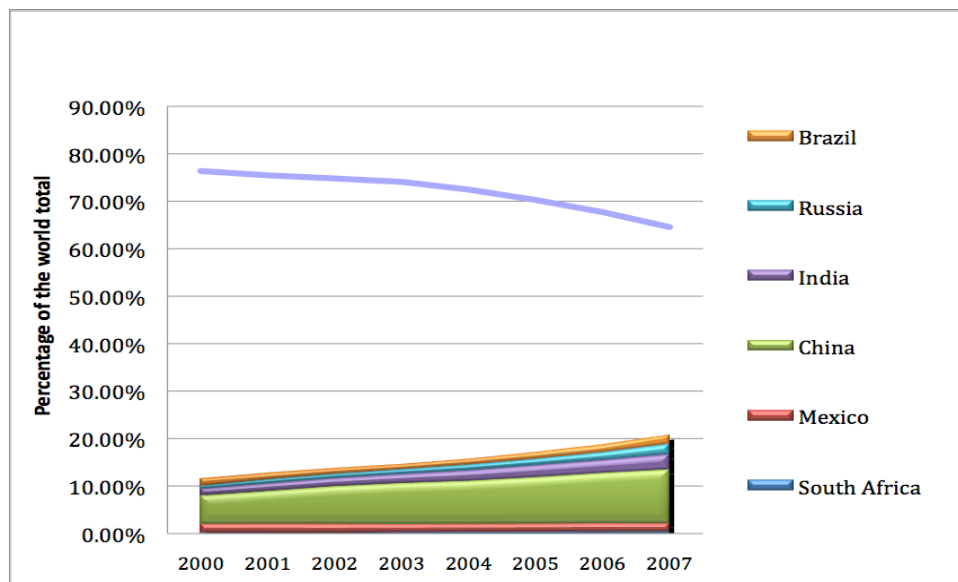
Who Is Funding Activities that Increase and Reduce the Environmental Footprint of BRIC+ Countries?

Representing a sharp rise from just a few years ago, in 2008 BRIC+ economies accounted for slightly over one fifth of the global GDP and gross fixed capital formation, approximately eight percent of the global outward direct investment, and a growing share of cross-border loans and other financial flows (MIGA, 2009) (Figure 1). BRIC+ countries' share of global pressures on the environment, however, is much higher. In particular, the six emerging economies are responsible for over one third of the global greenhouse gas emissions, almost as much as the share of all high-income Organisation for Economic Co-operation and Development (OECD) countries.¹⁰ This means that the

¹⁰ According to the World Bank's classification followed in this paper, the high-income OECD countries are: Australia, Austria, Belgium, Canada, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Japan, Republic of Korea, Luxembourg, the Netherlands, New Zealand, Norway, Portugal, Slovak Republic, Spain, Sweden, Switzerland, the United Kingdom, and the United States of America.

carbon intensity of the group of six emerging economies is about 50 percent higher than the world's average. It is noteworthy that China has been by far the main source of growth of carbon emissions among all BRIC+ economies (Figure 2). Continuation of BRIC+ and other developing countries' carbon-intensive growth under the business-as-usual scenario will undermine the goal of preventing the levels of global warming associated with irreversible changes in the environment (a 2°C rise from preindustrial levels)—as will the business-as-usual development of the developed countries (Stern, 2007).

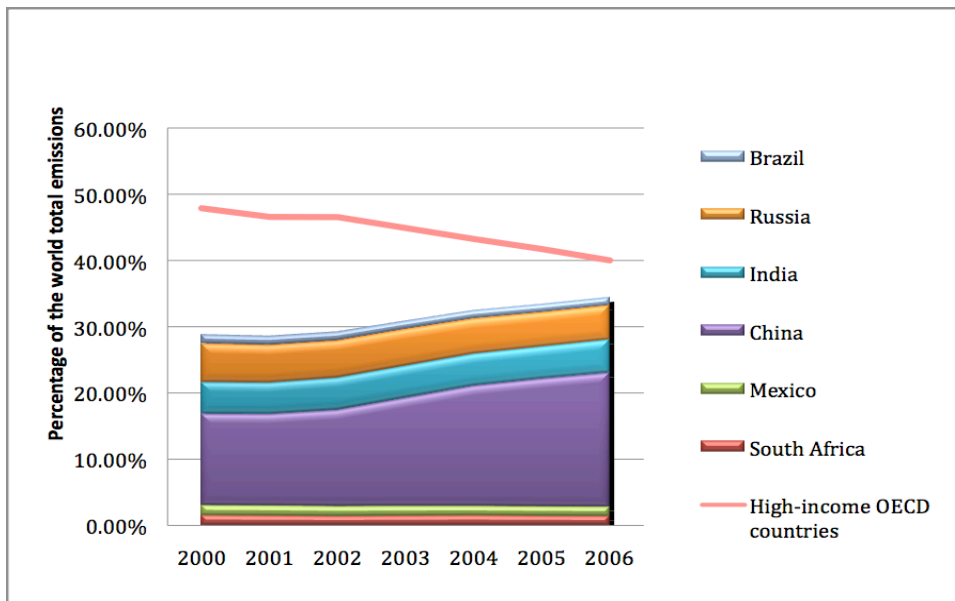
Figure 1: Gross Fixed Capital Formation: BRIC+ Countries Versus High-Income OECD



Source: World Bank 2010a.

Due to data deficiencies described in the second section of this paper, at this point it is difficult to quantify the proportions of environmentally unfriendly and green investments in BRIC+ countries funded by domestic versus foreign capital flows. Nevertheless, evidence from case and industry studies makes it possible to suggest that while both international and domestic finance significantly contribute to increasing the environmental footprint of BRIC+ economies, international capital flows play a less significant role than domestic investments in greening these six countries (with a possible exception of Russia). This assumption is based on the following observations.

Figure 2: CO₂ Emissions: BRIC+ Countries Versus High-Income OECD



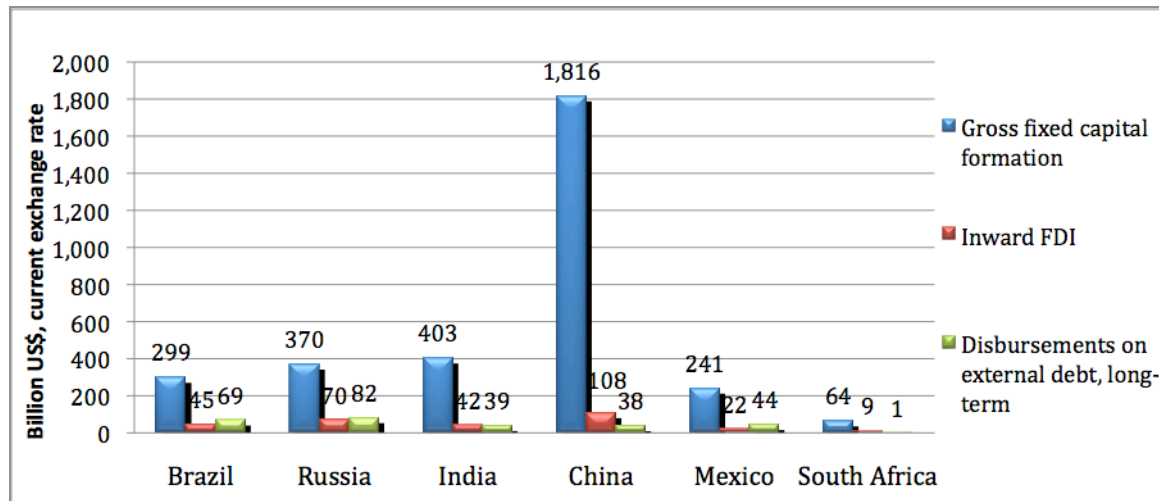
Source: World Bank 2010a.

Navigation through international investment news headlines and databases such as Dealogic reveals that companies from BRIC+ countries that tap international capital markets are, to a great extent, those active in environmentally sensitive industries, especially the energy and fuel sector. In particular, prior to the 2008–2010 financial crisis, all large fossil fuel and mining companies in Russia raised capital almost exclusively abroad, mostly in Western markets, but also in Japan, and especially recently, in China (Gerasimchuk et al, 2010).

Hence it is logical to hypothesize that external debt disbursements can significantly contribute to environmentally unfriendly investments in BRIC+ countries. The available information, in addition to the data on the overall gross fixed capital formation, is summarized to provide a snapshot of the main external sources of long-term (that is fixed capital-bound) investment in BRIC+ countries in 2008 (Figure 3).¹¹ These sources are inward foreign direct investment and disbursements on long-term external debt in both the private and the public sectors.

¹¹ The latest year-end data available; 2008 was relatively representative of the patterns formed over 2000–2008 in terms of BRIC+ countries tapping long-term investments from different sources.

Figure 3: Gross Fixed Capital Formation and External Sources of Investment in BRIC+ Countries, 2008



Source: World Bank 2010a; UNCTAD 2010.

However, the significance of foreign capital in funding the national environmental footprints varies across BRIC+ countries. In this respect, India and China are different from the rest of the economies in the group. Both India and China have very high rates of gross fixed capital formation (35 and 42 percent of the GDP respectively) and are largely independent from external financial markets (World Bank 2010a).

Conversely, Brazil, Russia, Mexico, and South Africa have much lower rates of gross fixed capital formation, ranging from 19 to 23 percent of the GDP (World Bank 2010a). Environmentally sensitive projects in these countries, especially in Russia and Brazil, to a considerable extent raise capital in the form of foreign loans.

Like environmentally unfriendly activities, green projects in BRIC+ countries receive funding both domestically and from external sources. In particular, the Clean Development Mechanism and Joint Implementation scheme under the Kyoto Protocol to the UN Framework Convention on Climate Change enables developed countries to offset their emissions through investments into carbon reduction projects in other countries, especially those where the abatement cost is lower. These projects are independently verified and in addition to business as usual.

Generally, the degree of attractiveness of green projects in BRIC+ countries is influenced by the overall host economy investment climate and risks, including those with respect to the local currency, its convertibility, and its exchange rate. China's yuan is commonly claimed to be undervalued, which implies relatively lower investment costs and helps the

country to attract foreign investment. Therefore the undervaluation of yuan can be one of the factors in China's success as the predominant destination for international capital flows under the Clean Development Projects. Under the scheme, China attracted nearly \$2 billion in 2009, or 72% of the global market (World Bank 2010b).

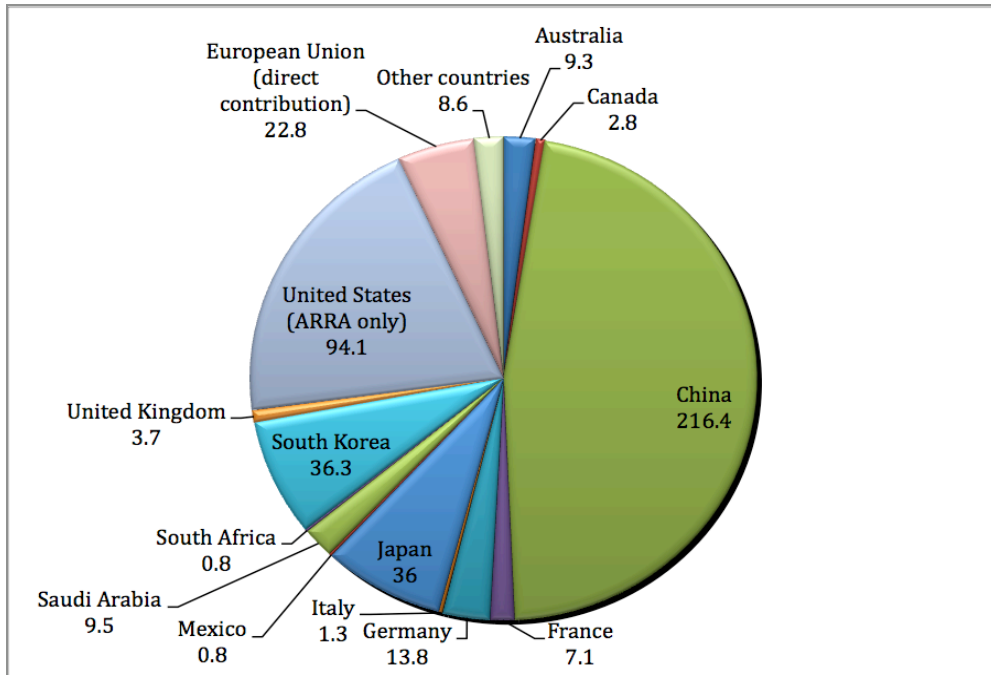
Overall, many potential green investment targets in BRIC+ countries experience difficulties with accessing international capital markets – unlike their counterparts in the environmentally unfriendly industries. Many domestic projects aimed at reducing negative impacts on the environment have to be implemented at the community level, and are of small and micro size. Such projects are often characterized by a lack of credit history, diseconomies of scale, and high transaction costs for foreign lenders and other investors.

Therefore, foreign investors can play only a limited role in greening the development of BRIC+ countries. Reduction of the environmental footprint of these economies depends mostly on domestic investors in both the public and the private sectors. Despite the data limitations described above, it is possible to identify some emerging trends in this area with the help of such recent phenomenon as green stimulus, which is public spending on environmentally oriented projects as part of anti-crisis measures.

Stimulus funds that have been earmarked for environmental purposes worldwide have a lifespan of three to five years (Figure 4).¹² Again, these data reveal heterogeneity of BRIC+ economies since only three of the six countries—China, Brazil, and South Africa—have a green component in their stimulus packages. Moreover, China is the world's absolute leader by the size of its green stimulus, which amounts to \$216.4 billion. Meanwhile, green stimulus is primarily oriented to new, or greenfield, projects, while investments to reduce the negative environmental impacts of the existing brownfield projects is also important.

¹² These purposes include support for renewable energy, carbon capture and sequestration, energy efficiency, public transport and rail, electrical grid transmission improvement, and waste and water treatment, among others.

Figure 4: Green Stimulus as of 1 July 2009, Billion US\$, Current Exchange Rate



Source: Based on data from Barbier 2010.

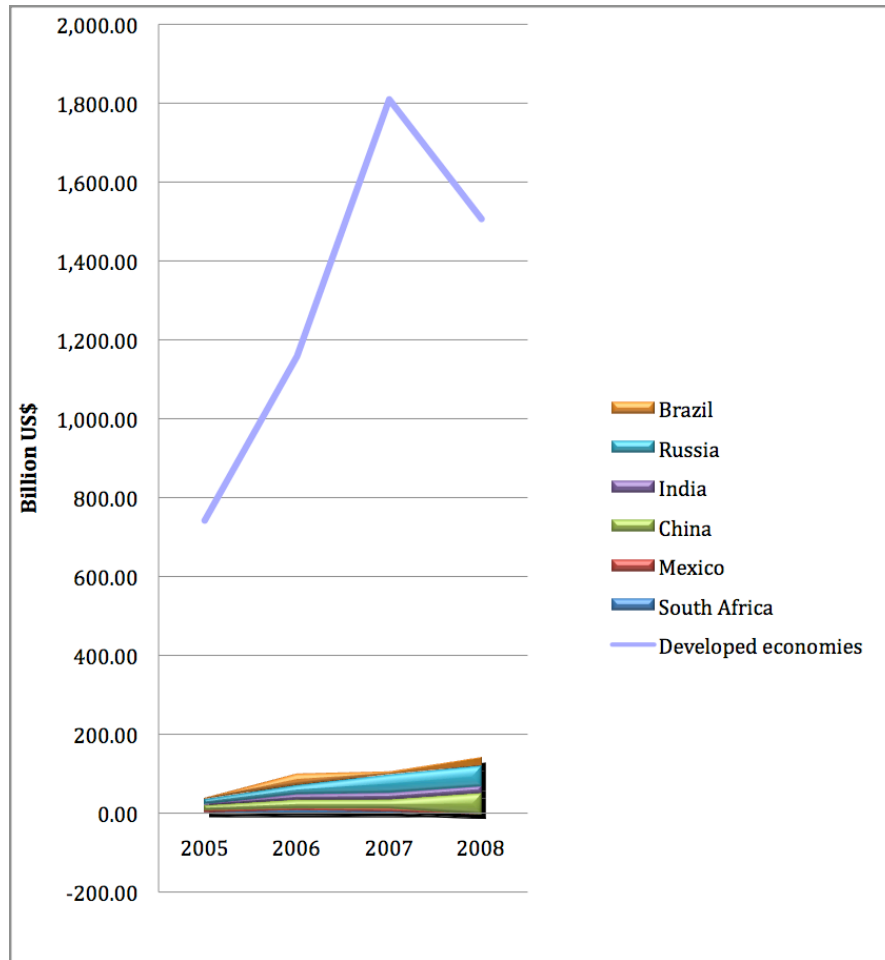
It is noteworthy that public spending generally has multiplication effects and complementarities with private investors. In particular, in the low-carbon development sector, it has been estimated that each US\$1 spent by public funds results in US\$2–\$6 or even more in private investment.¹³ However, given the novelty of green public spending in BRIC+ countries, the domestic private investors in these countries are still at early stages of exploring the business of environmental investing. The penultimate section of this paper takes a closer look at factors that can prompt them into redirecting their investment activities from conventional to green projects.

¹³ The Clean Development Mechanism under the Kyoto Protocol to the UN Framework Convention on Climate Change has potentially facilitated “about \$106 billion . . . of overall 2002–08 investment in projects that reduce greenhouse gas emissions for an average leverage ratio of 4.6. If industrial gas transactions are not considered, there is a much higher global leverage ratio at 6.5.” (World Bank 2009: 41). For the period 2012–2020, the UN Secretary General’s High-Level Advisory Group on Climate Change Financing estimated the global leverage ratio for private sector carbon finance at 2–4 on public flows and carbon market offsets (AGF 2010: 27).

Outward Investment Flows from BRIC+ Countries

In 2008 outward direct investment from all of the BRIC+ countries amounted to \$140 billion, or about eight percent of the global total. Meanwhile, China and Russia accounted for as much as three quarters of these flows, each contributing slightly over \$52 billion (Figure 5).

Figure 5: Outward FDI: BRIC+ Countries Versus Developed Economies



Source: UNCTAD 2010.

Before the 2008–2010 financial crisis, Russia ranked first among BRIC+ economies by volume of outward investment, but it should be noted that a large share of it was repatriated to Russia via third countries, especially offshore zones. However, a significant share of the remainder of Russia's outward direct investment was also channeled into environmentally sensitive projects in the former U.S.S.R. republics, Europe, and Sub-Saharan Africa (Gerasimchuk 2009).

Since the beginning of the financial crisis in 2008, examples of China's outward capital flows include the expansion of investments into such environmentally and socially controversial projects as development of oil-rich tar sands in Canada¹⁴ (Goldenberg, February 14, 2010), coal mines in Australia (*Australian Journal of Mining*, June 22, 2010), oil deposits in Sudan, and tropical forest harvesting in West Africa (Bosshard 2008). China's external loans also have a growing environmental footprint. For example, in 2009 China Development Bank acted as the sole lender of \$15 billion to the Russian state-owned oil producing company Rosneft and \$10 billion to the state-owned oil pipeline operator Transneft. The loan was earmarked for construction of an oil pipeline from Russia to China (Mazneva, February 18, 2009).

However, more data are required to establish if such investments into environmentally unfriendly projects are representative of Chinese investors abroad that increasingly target not only natural resource industries, but also other sectors (Scissors 2009) (Figure 6).

**Figure 6: Top Destinations of China's Outward Investment Flows.
Non-Bond Transactions Over US\$100 Million (2005–2009).**

Country	Total, US\$ Billion
Australia	29.8
U.S.	21.2
Iran	10.7
Kazakhstan	9.7
U.K.	8.2
Democratic Republic of the Congo	7.9

Source: Scissors 2009.

Outward investment from India, Brazil, Mexico, and South Africa has not yet become a similarly significant phenomenon, but the process is developing according to the same pattern. For example, Indian conglomerate Reliance Industries has announced plans to spend over \$3 billion on three US shale gas joint ventures (*DNA India*, October 31, 2010).

¹⁴ Chinese investors in Canadian tar sands include PetroChina, CNOOC Group, Sinopec, and CNPC.

The Drivers of Investment Flows In and From BRIC+ Countries: A Model Proposal

Determinants of environmental practices of investors and companies are the same for investors from both BRIC+ and developed economies. Therefore any differences in the environmental profile of investments from these two large groups of countries can be explained by their different exposure to external drivers and different interplay of internal and semi-internal factors (see the discussion of previous research in the second section of this paper).

If it is possible to suggest an overarching variable determining the environmental profile of investment, it will be the investor's time horizon, since environmental investments normally have much longer payback periods than conventional investments:

$$\begin{aligned} (1) \text{ Environmental soundness of investment } i &= \alpha_0 \\ &+ \alpha_1 \text{ Time horizon of investor } i \\ &+ \alpha_2 \text{ Control variables } i \\ &+ \varepsilon_i \end{aligned}$$

Examples of control variables for the model have also been discussed previously (in the second section) and include, but are not limited to, prices of energy and other natural resources; green demands of investor's clients; green demands of civil society; green demands of business partners, particularly creditors and insurers; green practices of competitors; and availability of environmentally friendly technologies.

Hypothesis 1 is that α_1 is positive: the more long-term oriented the investor is, the sounder the environmental profile of its investments.

However, quantitatively estimating investors' time horizons is no less challenging than measuring corporate environmental performance as described in the second section of this paper. Meanwhile, case studies discussed below allow decomposing investors' time horizons as dependent on the stringency and continuity of regulations in host countries (β_1), investor's ownership structure and mandate (β_2), and investor's interest and expertise in diversification beyond environmentally unfriendly industries (β_3):

(2) Time horizon of investor $_i = \beta_0$

+ β_1 Stringency and continuity of regulations in host country $_i$

+ β_2 Investor's ownership structure and mandate $_i$

+ β_3 Investor's interest and expertise in diversification beyond environmentally unfriendly industries $_i$

+ β_4 Control variables $_i$

+ ε_i

Consequently, the model proposed for future econometric testing is the following (Figure 7).

(3) Environmental soundness of investment $_i = \gamma_0$

+ γ_1 Stringency and continuity of regulations $_i$

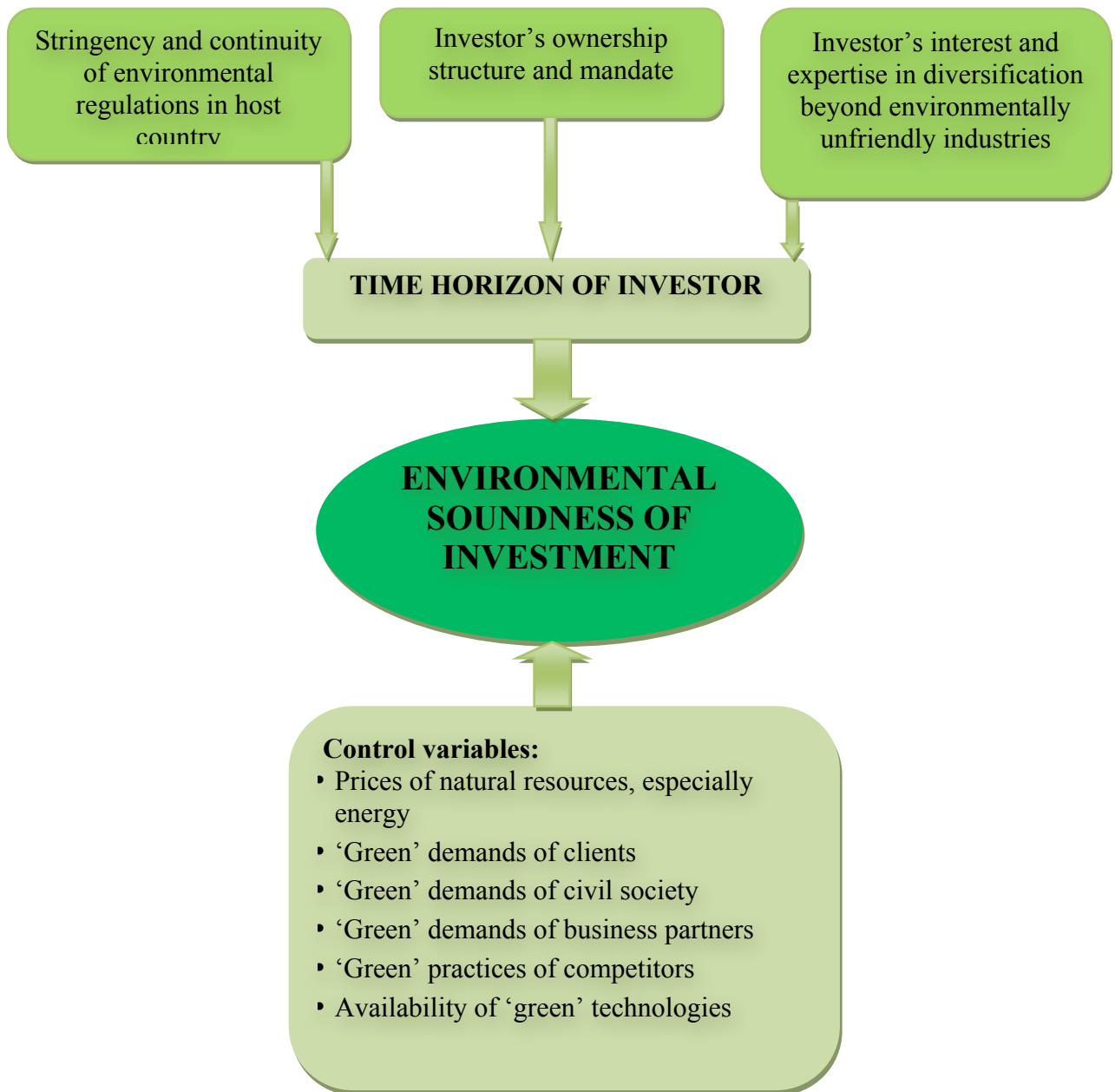
+ γ_2 Investor's ownership structure and mandate $_i$

+ γ_3 Investor's interest and expertise in diversification beyond environmentally unfriendly industries $_i$

+ γ_4 Control variables $_i$

+ ε_i

Figure 7: Drivers of Environmental Soundness of Investment: Proposed Model



Source: The author.

Hypothesis 2 maintains that the more stringent and predictable the environmental regulations in host economies are, the more long-term the investors' thinking is. This reasoning follows Porter and van der Linde (1995) in postulating that in order to encourage better environmental practices and competitiveness, green regulations should be strict but flexible. Flexibility requires performance-based regulations that set goals to

be met by the industry without specifying the means, thus allowing business to innovate and use various approaches to achieve the goals.

In order to commit funds to environmentally sound investments, investors also require clear timelines for the introduction of stricter environmental standards without rolling deadlines. Meanwhile, it is not unusual for environmental regulations and timelines to change with the change of governments, which creates uncertainty and impedes green investments.¹⁵

All BRIC+ countries have declared their environmental targets, for example, commitments to greenhouse emissions reductions under the Copenhagen Accord. However, the regulatory signal they are giving to investors has more to do with a practical machinery of achieving these targets, such as the introduction of legislative frameworks enabling participation in international carbon finance schemes; elimination of fuel and pollution subsidies; public investment and public private partnerships in environmentally oriented activities; attractive feed-in tariffs for renewables; clear timelines for new technical regulations coming into force; and other measures.

With varying degrees of success, Brazil, India, Mexico, and South Africa have advanced in each of those directions, ensuring that capital flows are channeled into green projects not only through public investment vehicles but also through the private sector. China, with its more centralized system, has created its own model. In 2007 the People's Bank of China developed an environmental database of Chinese companies. It also requires commercial banks to review and weigh their clients' environmental history before approving credit applications. In the same year, the People's Bank of China, along with the Ministry of Environmental Protection of China and the China Banking Regulatory Commission, established a green credit system that aims to restrict the availability of loans to companies that are in violation of environmental laws (PBoC and WWF, 2008).

On the downside, in all of the BRIC+ countries there remains a gap between environmental regulations and their enforcement, and the investment into environmentally unfriendly sectors of these economies continues to grow. However, the increase of capital flows into the green economy in Brazil, India, China, Mexico, and South Africa testifies to changes in investors' attitudes. By contrast, in the absence of a practical regulatory framework for green investment in Russia, both domestic and foreign capital flows fuel predominantly environmentally unfriendly industries of this economy.

¹⁵ For example, the U.S. signed the Kyoto Protocol under the Democrats, but failed to ratify it after the Republicans came into power.

Hypothesis 3 assumes that financial institutions with open and publicly accountable ownership structures (for example, those that are publicly listed) have a longer time horizon than those with closed and opaque ownership. In the private sector, the latter are often driven by speculative interests of gaining quick profits to benefit a small group of individuals. For instance, a number of environmentally unfriendly assets that Russian investors purchased in Southern Africa and Australia in 2000–2008 were later resold, which demonstrates that these transactions were driven mainly by speculative interest.

Another type of closed ownership is that by the state, which in the case of BRIC+ countries can make a company or an investment institution a black box. Like any other investors, state-owned entities can be conduits of capital flows into green or conventional projects, or, most likely, both. Except through the exercise of government discretion, there is no other way to shift the balance between the two types of investment.

Listed companies that have an open ownership structure are usually in mature stages of their life cycle, that is, beyond the stages of short-term survival practices. Furthermore, financial institutions such as pension funds are long-term oriented by their mandate to operate. Johannesburg Stock Exchange, BM&FBOVESPA in Sao Paulo, and Shanghai Stock Exchange have all played an important role in greening investment flows in their respective countries by encouraging listed companies and financial institutions to report and disclose their environmental and social performance.

An open ownership structure also creates more opportunities for a less arbitrary decision-making process through potential representation of different interest groups, including foreign investors. Stakeholders, including civil society organizations, can better influence the decision-making process in these financial institutions through the dialogue with different members of the Board of Directors (or their equivalents). This is specifically the case in Brazil and South Africa, two of the BRIC+ countries with the most developed NGO sector.

Hypothesis 4 suggests that investors' interest and expertise in diversification beyond environmentally unfriendly industries can positively impact their time horizon. Investors tend to expand their activities in the industries they are most familiar with, which in the case of BRIC+ countries may explain the gravitation towards extractive industries. For example, both public and private Russian investors have been actively pursuing large-scale projects in the nuclear and hydropower industries in both Asia and Africa because the country tries to draw on the relevant expertise in these areas. However, investors also need to diversify their portfolios, and green projects can be a very attractive opportunity in this respect since this type of asset has no strong correlations with other types.

Precise definitions and methods of value measurement for the five variables (environmental soundness of the investment, time horizon of the investor, stringency and continuity of environmental regulations by the host countries' government, investor's ownership structure and mandate, and investor's interest and expertise in diversification beyond environmentally unfriendly industries) depend on the future aggregation of relevant data. As previously described in the section on accomplishments and shortcomings, at present there are still some serious limitations in this area. However, given the increasing interest in green economy issues in the academic, government, and financial circles, overcoming this barrier appears to be only a matter of time.

Testing the model should also include checks for possible correlation between the stringency and continuity of environmental regulations in the host economy and control variables.

Concluding Remarks

What can one expect of investors from BRIC+ countries in terms of diverting capital flows from conventional to green activities? This question, posed at the beginning of the article, requires first, steadfast attention to the dynamic development of investment activities in BRIC+ countries, and second, much more empiric research than has been undertaken so far by academia and other interested institutions. Any "by definition" allegations about investors from BRIC+ economies being "dirtier" than their counterparts from the developed countries, or the other way around, lack solid foundation.

To make the agenda of green versus conventional investments more transparent, there is a need for consistent monitoring and reporting of relevant data at the national level in the same manner as national statistical agencies provide breakdowns of gross fixed capital formation or foreign direct investment by industry. Both private (for example, Bloomberg New Energy Finance initiative for the sector of renewables and energy efficiency) and public stakeholders (the Green Economy initiative of the UN Environment Program) have already begun monitoring and aggregating data on funding that is raised by environmentally oriented activities. However, in order to be better integrated into the decision-making processes by investors and their regulators, such information needs much more solid methodological consistency and broader accessibility.

Based on the available information analyzed in this article, it is possible to reach two conclusions. First, stringent, predictable, and flexible environmental regulations by governments are indispensable for diverting capital flows from conventional to green segments of the economy. With Russia as a laggard, BRIC+ economies have already significantly advanced in this direction by introducing legislative frameworks for national participation in international carbon finance schemes; eliminating fuel and pollution

subsidies; initiating green public investment and public private partnerships; establishing attractive feed-in tariffs for renewables; designing clear timelines for new technical regulations; and undertaking additional relevant steps. Such measures extend investors' time horizons and enable a clear message that green investments that may appear not so advantageous in the short term, may prove to be both profitable and sustainable in the long term.

Second, at present, investment institutions from the developed countries often see their counterparts from BRIC+ countries as competitors. Corporate clients trying to raise capital from BRIC+ economies also share this view when they cannot find funding in the high-income OECD countries. However, greening objectives require partnerships, not competition between investors from BRIC+ and developed countries. Increased cooperation between these two groups of investors can promote green investments by changing two variables in the equation: investors' ownership structure and their interest and expertise in diversification beyond environmentally unfriendly industries.

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