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Background: Why protecting the environment matters?

For the longevity of our species as well as much of the biodiversity that remains, understanding the environmental impact of our decisions is paramount. We are amid the 6th mass extinction in the Earth's history, and unlike the previous five this one's on us. Having transgressed from the Holocene to the Anthropocene, we have found ourselves in an era that has lost many of the ecological features that has enabled our species to live such high standards of living, for wealth is dependent on that which nature provides. Over the past several decades, beginning around the 1970's, we have been able to demonstrate that the planet has been warming at an alarmingly high rate, and it's now well known that it's due to a build-up of atmospheric carbon – primarily as the result of burning fossil fuels. To make matters worse, we are simultaneously destroying or incapacitating carbon sinks. Deforestation rates have somewhat slowed since their high in the 1990s (Ewers, 2006); however, according to the Earth Policy Institute in 2012, only about two-thirds of global forest cover remains compared to the pre-industrial era, and unfortunately for us it does not seem like deforestation follows an environmental Kuznets curve (EKC), a phenomenon that we will explore in more depth later (Koop & Toole, 1999)

As we have slowly begun to realize the damage we have been doing, attempts have rightly been made to regulate economic activity. The Kyoto Protocol of the 1990s, the Clean Air Act of 1970, and Alexandria Ocasio Cortez' recently proposed New Green Deal are just a few examples of such efforts. Even the North American Free Trade Agreement (NAFTA) included a side agreement that established the North American Development Bank, which serves the purpose of financing projects supporting environmental infrastructure.

Alongside the political efforts, there's been a vast amount of research aimed at understanding what exactly is going on here. Not only is it vital to understand how the Earth is changing, we need to know

why it's changing. What exactly is it that we are doing (and not doing) that is harming the ecosystem, including ourselves? From an environmental perspective, do things need to get worse before they get better? Where would our efforts be best employed, and how do we improve the standard of living for humanity without destroying the planet that our vitality depends upon? All of these questions have an economic component, because resources are finite, and time is of the essence. For better or worse, we now live in a global economy, and as a result, decisions can impact people on the other side of the world (essentially instantaneously in some instances). Foreign direct investment is one such type of a decision, and because of its potential impact on, and implications for, the well-being of both people and the environment, it will be a focal point of the majority of the rest of this paper.

Foreign direct investment: Potential risks, benefits, costs, and how its related to the environment

Myriad studies have been conducted to try to understand the role that foreign direct investment, more commonly referred to as simply FDI, plays in our now highly interconnected world. FDI in a very basic sense is just investment in business conducted in another country that equates to more than 10% ownership. That investment can take various forms, and as such they can be categorized in different ways: Greenfield vs. Brownfield or horizontal vs. vertical, for example. The distinction between the types of FDI are dependent on the nature of the investment. Greenfield FDI involves establishing a new facility and new operations abroad, whereas Brownfield FDI is the acquisition of an existing entity. Regardless of the nature of the investment, however, in all cases there will be impacts on both the investor(s) – which is usually a corporation – and on the inhabitants of the surrounding region. Some of those impacts are desirable, others are not.

With FDI comes an influx of various things – knowledge, management skills, technology, capital, and employment are perhaps the most noteworthy of which – and along with those things can come GDP growth and an increase in standard of living (Acharyya, 2014; Sharma & Abekah, 2008; Abdouli, Kamoun, & Besma, 2008). For this reason, FDI has become sought-after over the last several decades, and there are even companies that specialize in attracting it. Investment promoting agencies, or IPAs for short, significantly increased in the years leading up to 2014, at which time about 81% of the 190-some odd countries in the world had a national IPA, including 78% of developing countries (Miskinis & Byrka, 2014). Clearly, there is something to be gained by hosting FDI. Yet despite the potential for good, FDI is not without its drawbacks.

On the investor side, there are risks and costs (which are not entirely different, of course).

Macroeconomic stability, pre-existing investment treaties, political stability, political corruption and corruptibility, tax law, intellectual property laws, trade agreements, and ability repatriate money and

capital all can influence FDI (Grosse & Trevino, 2005; Zekos, 2014; Adams et al., 2014). Not surprisingly, strong contract enforcement laws, consistent and predictable regulatory action, and efficient international trade agreements are attractive to FDI (Contractor et al., 2020).

For host countries, or at least for the regions in the vicinity of a location of a foreign multinational, the main concerns and potential drawbacks tend to be environmental. With industry can come increased carbon emissions, polluted water, and deforestation. Analyzing empirical data from between 1965 and 2010, Hitam and Borham (2012) showed, for example, FDI was positively correlated with (and seemed to cause) environmental degradation in Malaysia. Similarly, FDI has worsened the environment in China in both the short and long-run and at least in the short-run in India. Both of these economies have been among the fastest growing in the world since opening up to international trade and FDI a few decades ago, but the income growth has come at the expense of the environment in many ways. In both China and India, CO₂ emissions more than tripled between 1980 and 2006, and this was related to an increase in per capita income (Baek & Koo, 2009). By the beginning of the 21st century, as a nation India was the 4th largest contributor of carbon emissions (Acharyya, 2014). Furthermore, in India it's also been suggested that FDI slows access to potable water for vulnerable populations, much of that vulnerability having to do with socioeconomic status (Rudra, Alkon, & Joshi, 2018). Poor people do not have the same political influence as people with higher income, which illustrates another criticism of FDI, namely that when it is not regulated properly the well-being of vulnerable populations can be at the mercy of the investors.

Given these findings, one notion that has been proposed is that multinationals might seek out countries or regions that allow them to pollute, such as poorer developing countries, because implementing “green” or clean methods of production can be costly, and developed countries typically have more stringent environmental regulations. This so called “pollution haven” hypothesis has drawn a substantial amount of attention of researchers. The findings as to whether investors of foreign multinationals seek pollution havens – that is places that have lax policies and low environmental standards – have varied widely.

Broadly speaking, there seem to be four main categories of country-specific factors that affect FDI inflows: 1) macroeconomic and financial, 2) institutional and regulatory, 3) natural resource endowment, and 4) social-cultural (Dimitrova, Rogmans, & Triki, 2020). A study from Manderson & Kneller (2011) suggests that environmental regulation is not a robustly significant determinant of the decision to pursue FDI, likely because it is one of many factors and costs to take into consideration. Similarly, another study found that environmental policy was not a statistically significant determinant of the location chosen for industrial activities of French firms when investing internationally (Raspiller & Riedinger, 2008).

Contrary to both of those studies, however, there examples of environmental policy influencing FDI location. Fredriksson, List, & Millimet (2003) state that government corruption and environmental policy

played a role in determining spatial allocation of FDI inflow to the US between 1977 and 1987, having reached this conclusion by analyzing state-level data.

Then there are findings that are different still. Using empirical data from 120 developing countries from 2000-2014, Kim & Rhee (2019) found the exact opposite of the pollution haven hypothesis. That is, they found that more stringent environmental regulations seem to attract FDI! And not only can environmental regulations potentially influence FDI inflow, FDI inflow can seemingly influence environmental regulation. A review of data from 33 countries suggested that FDI influences environmental policy in ways that are dependent on the corruptibility of the local government: If there is FDI in countries which are easily corrupted, environmental policy seems to become less stringent, and if FDI is in countries that are less corruptible, environmental policy might become more stringent. (Cole, Elliott, & Fredriksson, 2006).

So, which is it? Are corporations seeking places that have strict or lax environmental standards? Or are environmental standards hardly even a factor in the decision? The answer is certainly situation dependent and nuanced, but a meta-analysis of data across 27 OECD source countries and 99 host countries from 2001-2007 can probably shed some light. What was found from that data is that there is a statistically significant, albeit small, relationship between FDI inflow and the degree of laxity/stringency of a host country's environmental policy. It was a non-linear relationship, because if a country's environmental policies are too lax, the country becomes unattractive for FDI. The authors stress that the effect is small and is a subsidiary to overall regulatory quality. In other words, it seems like investors are ok with stringent environmental policies to an extent because usually these types of policies coincide with things that indicate less risk (e.g. bureaucratic transparency, consistency of enforcement...) (Kalamova & Johnstone, 2011).

One possible reason for the inconsistent findings regarding the relationship between FDI and environmental regulation is outlined in a paper from 2002. In it a British lawyer asserts that consistent support for the pollution haven hypothesis likely doesn't exist for a combination of reasons, including that 1) As previously mentioned, the ability to pollute is a low-cost determinant of FDI given the expenses of relocating and the risk associated, 2) a company is never going to admit that lax environmental standards are a reason they chose a particular location, and 3) a nation or regional government is not going to admit that they are tailoring public policy to allow pollution just to attract FDI (Gray, 2002).

Another couple of reasons for the inconsistent results are related to an aforementioned concept that we need to explore in more depth, and that is the environmental Kuznets curve (EKC). This concept was introduced by Grossman and Krueger in the mid-1990s, and it relates pollution to a widely familiar

economic concept introduced about 4 decades earlier than that by Simon Kuznets. In a landmark paper published in 1955 for which he later won a Nobel prize, Simon Kuznets showed that a (inverted) U-shaped relationship exists between income inequality and economic growth (Kuznets, 1955). In similar fashion, Grossman and Krueger (1996) published a paper in which they claimed that there is no evidence that the environment degrades steadily with economic growth. Using four indicators of environmental pollution: concentrations of urban air pollution, oxygen availability in river basins, concentration of fecal contaminants in river basins, and concentration of heavy metals in river basins, they found the same inverted U pattern related to per capita income – hence the term EKC. Therefore, if these results are able to be generalized, a study regarding environmental effects of FDI, GDP growth, or other economic factors might be dependent on where the country is in terms of their path along the EKC. It also may be why some recent meta-analysis studies suggest that there the overall effect of FDI on carbon emissions is insignificant and close to zero (Demena & Afesorbor, 2020; Jugurnath & Emrith, 2018). It should be cautioned, however, that to the extent that an environmental Kuznets Curve exists, pollution is a variable that will be dependent on many other variables. Naturally with such a complex interaction, particularly when dealing with empirical results in what is tantamount to observational research (as opposed to the more tightly controlled experimentation that is typically characteristic of hard sciences), one would need to expect spurious and occasionally conflicting results.

It's important to also keep in mind that not all forms of pollution or environmental issues are going to follow the same patterns (like an EKC). Water pollution is not the same as carbon emissions is not the same as deforestation. In fact, there is research showing that deforestation, although positively correlated with FDI in developing countries (Jorgenson, 2008), does not seem to follow an EKC (Koop & Tole, 1999).

But regardless of the convoluted relationship between economic variables, environmental regulation, and environmental degradation, measures clearly need to be taken in many instances for the sake of protecting ourselves and the environment.

FDI and environmental regulations

Efforts that have been made to address environmental issues brought about by industry, economic growth, FDI, and the like have varied widely, but in a broad sense they usually involve one or more of the following: 1) making it more expensive to cause pollution (e.g. through implementation of taxes, fines, tariffs, etc.), 2) Making resource depletion more expensive, 3) subsidizing eco-friendlier options, and 4) outlawing certain products or activities. They can be supply-side or demand-side, and the effectiveness of the strategy is likely dependent on resource endowments of the country (Eichner & Pethig, 2019).

One solution developed by the European Union involves an emissions trading scheme and feed-in tariffs, wherein countries were able to obtain credits based on reductions in emissions. According to the European Commission (2011), since its inception in 2005 this program reduced overall carbon emissions by high-emitting countries by 8%. The model drew some criticism from Eichner & Pethig (2019), who demonstrated that there seemed to be a “waterbed effect” throughout the 31 participating countries, which means that essentially the welfare and decarbonization gains of some countries were offset by other countries.

Another attempted solution developed as a side agreement to NAFTA by the US, Canada and Mexico established the North American Development Bank, the purpose of which is to fund enterprises related to environmental sustainability. While the idea is good in theory, NAFTA has drawn criticism from environmentalists, primarily because this side agreement is essentially rendered subsidiary to the rest of the contract based on language from chapter 11. NAFTA’s chapter 11 is designed to protect foreign investors from risks associated with investing internationally; risks such as difficulty repatriating profit, limits on ownership, exclusion from certain industries, and export requirements designed to protect domestic producers. It achieved this by:

- Creating clear rules for fair treatment of foreign investors,
- Eliminating investment barriers,
- Establishing a system for resolving disputes between investors and host countries (Ferguson, 2011).

A clause in chapter 11, article 1110 of the contract hosts to FDI are not able to directly or indirectly expropriate or take measures that are “tantamount to nationalization or expropriation” unless it’s:

- For public purpose;
- Non-discriminatory;
- In accordance with due process and international law;
- Or on payment of compensation.

The problem with that is companies could file a lawsuit against another nation if environmental regulations are passed which restrict their ability to operate, and the policies are deemed “tantamount to expropriation” (Royalty & Ross, 2007). This is a legitimate concern, especially given the potential for

corruption to factor into decisions about whether to protect the environment or award damages to a company for perceived harm.

Conclusions

There are always going to be conflicting studies. Confounding results in literature can be attributable to multiple things: Sampling error, poor research methodology, and inaccurate models to name a few. Economics is already at a disadvantage when it comes to research in many ways, because it is largely dependent on observational research. That is, much of the data that is available and which we would want to study is from the real world. It is not typically collected by researchers via experimentation. Instead, researchers compile information, which often collected by various people in various locations at different times, they analyze it, and interpret the results. There's nothing inherently wrong about this strategy; however, given the nature of how economic research much be done, economists need to be extra careful along the way so as not to misstep and reach incorrect conclusions. Kuznets said it well when he described economics as "a field of study that has been plagued by looseness in definitions, unusual scarcity of data, and pressures of strongly held opinions" (Kuznets, 1955). More skepticism and carefully chosen wording would serve not only the field of economics well, but also the world, because the implications of economic guidance and decision making are far-reaching.

Regarding research about FDI and environmental impact, it would be beneficial if people would pay more mind to being precise with their language. Everybody wants for their research to be impactful, but it is irresponsible to try to expand the generalizability of results by modifying language to make it seem like something was found that was not. What I mean by this is that it seems like, rather consistently, researchers investigate one aspect of environmental degradation – CO₂ emissions, let's say – and based on findings that CO₂ emissions decreased as per capita income increased, they claim that per capita income actually helps the environment. That's wrong. CO₂ emissions, or water pollution, or whatever is being measured is only one aspect of environmental degradation. There are many other factors to take into consideration, and it is extremely harmful to the public when researchers jump to conclusions and publish claims that may not be true.

We know that we are in trouble if CO₂ continues to build in the atmosphere. Even if there is an EKC for most types of pollution, it's counter-productive in many ways to think that GDP growth is the answer. It's an unrealistic expectation to grow GDP forever. Economics by definition is based upon finite resources. At some point we need to be agnostic about growth and just start worrying about doing the right thing, regardless of whether or not it helps the bottom line. As the editor put it in his introduction to an *Economic Policy* journal issue in 2007: "most panelists agree... that urgent attention needs to be given to

refining methods of measurement and valuation (of ecosystems) for use in the future”. That was 13 years ago when the global population was smaller, the Earth was slightly less warm, coral reefs were less bleached, and ice caps were more frozen. Once our priorities are straight, the remedy for the path forward will need to include more precision, efficiency, foresight, and wide-reaching policy changes. Thankfully, these are arenas in which economists should be well equipped to do battle.

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