

## **CASE STUDY:**

# **TECHNOLOGY AND INVESTMENT: POLICY RECOMMENDATIONS TO JUMP-START RENEWABLE ENERGY IN LATIN AMERICA**

### **Abstract**

East Asia has grown over three times as fast as Latin America since 1960, succeeding in both the social and economic spheres. The region now stands poised to excel in the global marketplace as renewable energy and low-carbon technologies take center stage. Why has Latin America not advanced in the same manner? This study examines the macroeconomic, development, and industrial policies that enabled East Asia to grow successfully, as well as the contrasting reasons why Latin America has not progressed at the same rate. This study will also explore which measures Latin American countries could take if they want to spread energy access through renewable energy implementation and become more competitive in its production.

### **Introduction and Problem Statement**

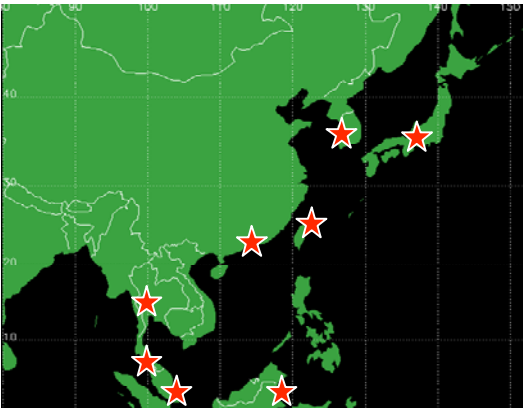
Climate change is progressing at an alarming rate. While developing countries are not held to internationally established emission caps due to their “right to develop,” it is important to remember that for the world to meet IPCC stabilization levels, all countries need to control their carbon output as they develop. Investing in renewable energy is a primary strategy in reducing emissions, especially because it does not restrict industrialization but instead can increase energy supply and access without increasing emissions.

Several Asian countries sit poised to excel in the production of renewable energy technologies due to their successful high-technology sectors. East Asia is esteemed for its rapid economic growth and technological advancement during the latter half of the 21<sup>st</sup> century. It is a contrast to Latin America, which continues to have slow economic growth in places and uneven progress towards social development goals.

As Latin America is trying to increase its energy access and advance its development, renewable energy technology is crucial. What can Latin America learn from East Asia’s success with rapid technological advancement through the open market? Which policies could Latin America use to increase investment in this technology? This case study uses a comparison of these two regions in order to recommend policies that could be used to increase both implementation and production of renewable energy technologies in Latin American countries.

### **East Asian Miracle**

The East Asian Miracle is characterized by an impressive growth rate that has been sustained over several decades. Since 1960, the East Asian countries have grown nearly three times as fast as Latin America on average and furthermore have, in most cases, decreased inequality. As a result, human welfare has improved dramatically: absolute poverty has dropped more than in other regions of the world; life expectancy has increased from 56 years to 71 years from 1960 to 1990; and education has improved. East Asia is often touted as a region of countries that have

EAST ASIA	
<b>Japan</b> <i>Asian Tigers;</i> <ul style="list-style-type: none"> <li>- <b>South Korea</b></li> <li>- <b>Taiwan</b></li> <li>- <b>Hong Kong</b></li> <li>- <b>Singapore</b></li> </ul> <i>Newly Industrializing Economies:</i> <ul style="list-style-type: none"> <li>- <b>Indonesia</b></li> <li>- <b>Malaysia</b></li> <li>- <b>Thailand</b></li> </ul>	
<p><i>* Note: while there is no formal grouping, normally these 8 economies are referred to together, and occasionally China is included.</i></p>	

“gotten the basics right” in their economies. They moved from closed to open economies quickly, relying on the market as well as strong government intervention to guide their transformation. Although they could not prevent the Asian Financial Crisis, the growth rates recovered quickly afterwards. East Asia has become a world leader in the production and export of many technologies, and it has successfully gained

technological knowledge through the process.

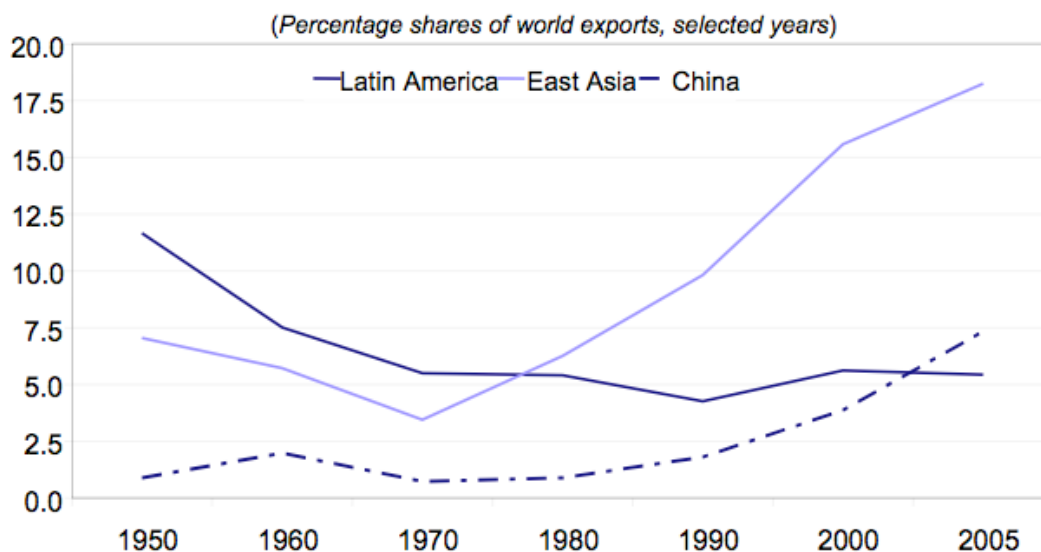


Figure I. Latin America, East Asian, and Chinese Shares in World Trade (Adapted from Machinea, Data source: WTO)

The East Asian countries invoked a variety of macroeconomic, development, and industrial policies that enabled them to maintain high economic growth, and although policies varied from country to country, there were several key strategies that most or all used. First, policies that established macroeconomic stability formed the base of the region, and established a foreign direct investment based development strategy. Countries maintained low inflation rates, fostered high domestic savings rates, kept borrowing under control with high export rates, and deliberately undervalued their exchange rates to give them an export advantage. Additionally, high rates of private investment were stimulated through the creation of clear rules, a sound

investment environment, and government incentives. The second type of policies, development policies, focused on increasing agricultural productivity (instead of shifting out of that sector) and constantly increasing human capital. They maintained high education rates, from primary to tertiary levels, and pursued training and other knowledge-building activities within industry. The third type of policies, industrial policies, focused on export-led growth, with the governments playing a large role to attract foreign capital and firms, using means such as subsidizing credit to selected industries. To become competitive internationally, they used performance measures like export targets to weed out uncompetitive companies. East Asia was not only able to grow quickly with the help of foreign firms, it was also able to benefit from technology transfer thanks to the use of local-content laws, spillover effects, and R & D collaborations. Few East Asian countries are more competitive than Europe or China in renewable energy technologies, but their capacity to manufacture high-technology products and their high levels of human and physical capital give them the ability to move in that direction if they so choose, just as China has done.

### **Significance**

The East Asia Miracle has many implications and important lessons can be derived regarding climate change and Latin American development.

Climate change predictions show that urgent action is needed to reduce carbon emissions, and while developing countries are not held to emissions caps under this period of the Kyoto Protocol, reductions still need to occur. Latin American countries are realizing this as they are feeling the physical changes of climate change, and they are also aware that the post-2012 international regime is uncertain. Emissions are often correlated with industrialization, but the ability to shift to a greater proportion of renewable energy sources could reduce future emission increases. Many Latin American countries are reaching out to implement clean technologies, but with the exception of Brazil, no countries have produced a significant amount of the manufactured parts. East Asia's ability to attract foreign direct investment, foster technology transfer, and become an exporter in high-technology products enables it to produce renewable energy technologies that can transform its economies. East Asian countries are also able to take advantage of high international demand for these renewable energy products.

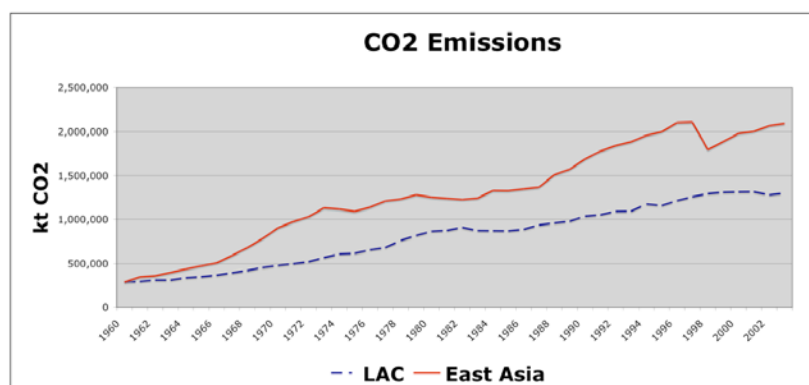


Figure II. Carbon Dioxide Emissions in Latin America versus East Asia (*Data source: World Development Indicators*) *Note: Taiwan was omitted due to lack of data.*

The second reason East Asia's experience is valuable for Latin America is the model East Asia presents for development. The two regions function within the same international market system and yet Latin America has not been able to replicate the economic success of East Asia. To be sure, Latin America went through stages of varying degrees of openness, but even today, when most countries are liberalized, Latin America's productivity and growth rate still lag far behind. GDP, productivity, and other economic measures are not meant to be the only measurements of success, but development indicators tell a similar story. While each region has significant variation among countries, on the whole, East Asia has been able to reduce poverty and inequality over this period more successfully than Latin America. Environmentally, South America's current specialization in natural resource products could also have implications for future generations depending on the degree to which the region depletes its natural resources.

### **Historical Comparison to Latin America**

Latin America's development varies markedly from East Asia, but its history sheds light on the different growth patterns. Throughout the colonial era, Latin America focused on agriculture and natural resource exports. In the mid-1900s the region turned inwards to focus on building a domestic



manufacturing industry through import substitution industrialization (ISI). State-owned enterprises dominated, and despite their high inefficiencies and costs, governments kept borrowing from abroad in order to build these industries. In the 1980s, the excessive borrowing and macroeconomic instability came to a head with the debt crisis. Afterwards these countries' development strategy changed with IMF requirements for stabilization and structural adjustment, as well as the liberalization and privatization strategies of the Washington Consensus that were being promoted as the proper development strategies. Due to restructuring and cuts in government spending, social services declined and in combination with economic problems, resulted in the decline of various development indicators during 1980s. The 1990s showed improvement, and government efforts centered on institution building; however, while the economic growth experienced during the 1990s was better than during the previous decade, it still did not compare with East Asia's. Since that time, South America has reverted to focusing on natural resource products, partly due to China's demand, and Central America and Mexico have built a manufacturing industry to export to the US market.

Table I. Regional Per Capita Growth Rates (*Adapted from Machinea, Data source: ECLAC based on IMF/WB data*)

<b>Regions</b>	<b>1961-2004</b>	<b>1961-1969</b>	<b>1970-1979</b>	<b>1980-1989</b>	<b>1990-1999</b>	<b>2000-2004</b>
<b>Developed countries</b>	<b>2.62%</b>	4.25%	2.86%	2.21%	1.79%	1.70%
<b>South East Asia</b>	<b>5.04%</b>	1.62%	5.01%	5.93%	6.53%	6.48%
<b>Latin America</b>	<b>1.54%</b>	2.45%	3.11%	-0.28%	1.32%	0.77%
<b>Sub-Saharan Africa</b>	<b>0.55%</b>	2.01%	1.17%	-0.73%	-0.57%	1.49%

Latin America's economic and development policies stand out in stark contrast to those of East Asia, as can be seen in Table I. In the 1960s, while East Asia went from being a closed to open economy, Latin America, which had always been somewhat open through colonialism, retreated into ISI before turning back to the international market in the 1980s and 1990s. Macroeconomic policy was one of the major differences between the two regions. Most countries within Latin America have had a tumultuous experience with monetary stability, even when following IMF recommendations. On the whole, Latin America has tended to raise interest rates and have relatively overvalued exchange rates, which has made it more difficult for small companies to get domestic credit and more difficult to sell exports. Overspending and borrowing to finance state-owned enterprises did not help its position.

The uncertainty of the investment environment deterred many private investors, who instead turned to East Asia. Recently, however, several Latin American countries have been trying to foster a more stable investment environment through free trade agreements with the US. In terms of development policy, the 1980s revealed that when government funding was pulled out of education and social services during the economic crisis, it caused a step backwards. Education has never held the same government priority as it does in East Asia, at any level, and Latin American countries have put little funding into R & D. Of course this does not hold true for every country, and perhaps the best counterexample is Costa Rica, which invested highly in both education and R & D, and during the 1990s, Intel decided to invest in the country.

Finally, the industrial policy of the two regions differs dramatically. Latin America has focused on agriculture, natural resources, and in Central America and Mexico, also on low-tech manufacturing. When they did try to expand manufacturing with ISI, they did not focus on exports and did not require any performance measures. As a result, they failed to eliminate uncompetitive producers, and instead viewed companies as part of the necessary development strategy and a method to gain political support (Roderick, Principles for economic diversification). East Asia on the other hand created targeted policies to incubate high-tech products and policies that could glean technological knowledge from these ventures and create spillover effects.

### **Conclusion and Recommendations**

This comparison does not suggest that Latin America should pursue the same policies that East Asia did. Both regions and each country within the regions have different sets of physical, human, and natural capital, as well as a different political culture that must be taken into account.

Certainly, Latin America has been trying to achieve macroeconomic stability and growth; therefore, it is important to identify which steps can make the biggest difference.

Renewable energy technological development is one area that would be strategic for Latin America focus on at this point. Implementation within the region would enable Latin American countries to increase energy access, reduce emissions while growing economically, and secure a larger portion of external funding. Production of these technologies for countries that have the right conditions could have added benefits of technological development, employment, economic growth, and spillover effects. Policy recommendations to strategically move in this direction include:

- Investing in R & D;
- Working towards higher education rates, especially on the tertiary level;
- Creating a stable environment for investors, clear laws and regulations, and intellectual property rights laws in order to attract foreign direct investment;
- Instituting laws to encourage technology transfer, such as local content laws, access to domestic credit for small and medium enterprises, and public/private research collaborations;
- Creating initiatives to encourage backward linkages, such as local content incentive programs for foreign companies, product standards (and associated programs to help domestic businesses meet those standards), and training programs;
- Focusing attention and fiscal resources on specific sectors.

Climate change is advancing and having profound effects of Latin America—decreasing water supplies from the Andes and rising sea levels are both issues of great concern. At the same time, as countries come together globally to tackle carbon emission rates, governments also have to be concerned about the social development and economic growth of their countries. One of the reasons that renewable energy is important is because it positively influences all sides of sustainable development: it can increase energy access and the population's well being, it decreases anthropogenic emissions and environmental degradation, and it holds the potential for local-scale employment and national-scale economic development.

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