# After Peak Oil: Who Escapes the Resource Curse?*

Jesica Andrews
The University of New Mexico

**Abstract**

Given the discovery of resource wealth, which factors account for future economic success and which factors hinder success? This case study compares two countries which discovered oil wealth in the late 1960s: Ecuador and Norway. The analysis gives the economic and political context and then compares three bodies of resource curse literature that relate to economic success. The study ultimately concludes that resource sale is the largest contributor to economic success. In the past "resource winners" have been praised for policies and economic outcomes only to have those policies deemed ineffective in retrospect. Norway is the current outlier in resource curse literature and is often cited as the most successful example of resource wealth management. However, projections indicate that Norway has started to show symptoms of economic decline now that it has reached peak oil. A final implication from this study suggests that resource curse literature should focus on whether the economic trajectories of resource winners can ever be sustained resource reserves expire.

* I am grateful to Dr. Chris Butler and Dr. Mark Peceny for their enduring guidance.

## Introduction

This case study applies resource curse literature to two case studies. By focusing on two specific cases this study shows that perhaps the division between "resource winners" and "resource losers" may be far more blurred than scholars suggest. Ecuador and Norway both discovered oil in the years that lead up to the oil price shocks that were suppose to have given oil exporting countries enormous economic clout.

In the 1960s Ecuador was a developing nation that discovered small oil reserves. Conversely, Norway was a highly developed nation that found huge oil reserves. According to resource curse literature Ecuador was faced with a "bad situation" (in terms of overcoming the resource curse) and today, it is not considered a "resource winner." Norway, however, began production in a "good situation." Norway developed unique policies and is frequently considered a "resource winner." Yet, Ecuador did as well as Norway for fourteen years (in terms of GDP per capita) until it reached peak oil. Furthermore, since reaching peak oil Ecuador has maintained steady growth both economically and in terms of human development. Norway reached its peak oil only this year (2010). The question then is: will resource curse literature continue to consider Norway as a "winner" in the decades that follow its peak oil?

## Literature Review

Resource curse literature grapples with two broad topics. The first topic is why resource rich countries frequently perform poorly compared to their resource poor counterparts. The second topic focuses on why among resource rich countries some succeed and others do not.

Resource rich countries are both some of the richest and some of the poorest countries on earth. Terry Karl (1997) summarizes the phenomenon as it relates to developing countries in her book the Paradox of Plenty. She asks "after benefiting from the largest transfer of wealth ever to occur without war, why have most oil-exporting developing countries suffered from economic deterioration and political decay?"(p. xv). In other words, why have developing countries been unable to use their resources to improve their economies?

Karl (1997) proposes that Petro-states are unlike other states. Petro-states are frequently resources losers because institutions favor rent seeking activities, and this is particularly true in countries where the discovery of oil wealth coincided with modern state-building. Karl theorizes that dependence on petrodollars produces a distinct institutional situation. This is because the initial bargaining situations between oil companies seeking to secure access to crude and local rules who want to consolidate their support results in centralize political power, strong links between public and private actors, poor development practices, and the replacement of domestic taxation with petrodollar influxes.

Other studies, like Mehlum et al. (2006), find that the quality of institutions can affect growth rates for the country. Mehlum et al. (2006) describe three ways in which resources interact with institutions. The first way is when the quality of institutions is hurt by resource wealth. A second way where institutions do not play an important role, and a third way where resource wealth is appropriated in relation to the quality of the institution. Additionally, Persson et al. (2008) find that the because presidential regimes imply less incentives for legislative participation and more separation of powers, a presidential system endowed with resources will redistribute wealth towards powerful

minorities and invest less in public goods. Conversely, parliamentarian governments redistribute wealth toward a majority and invest more in public goods. For the purposes of this study the most important findings on resource wealth and institutions comes from Michael Ross and his article "Does Oil hinder Democracy?" Ross (2001) shows that oil does, in fact, impede democracy. Moreover, Ross (2001) finds that oil deteriorates democracy more in poor countries than in rich ones. Finally, Ross (2001) finds that this phenomenon is not limited to the Middle East.

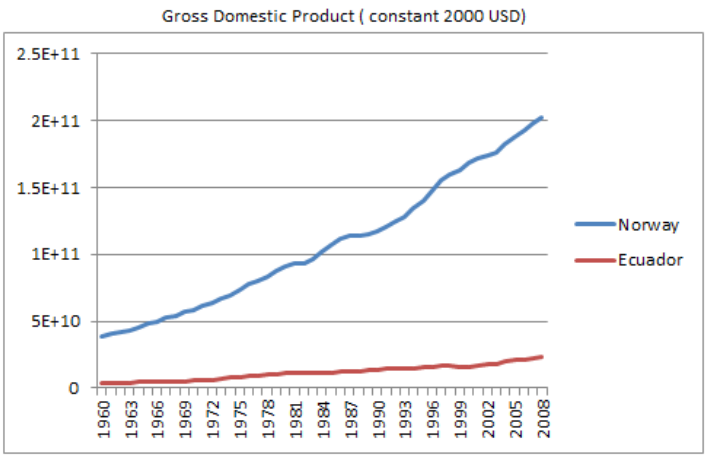
Sachs and Warner (1997) suggest that regardless of institutional type or quality, resource rich states tend to overspend during the onset of the natural resource wealth. Using a Ramsey growth model, Sachs and Warner display the convergence towards the natural steady state equilibrium which they conclude accounts for the negative growth seen in the resource curse literature. Another explanation for why resource rich countries perform poorly is the Dutch Disease. The Dutch Disease proposes that exporting resources deteriorates the manufacturing sector. This is because the cash inflow from the international market makes the exporting country's currency stronger. A stronger currency makes the products manufactured within the country cost more in the international market and so decreases the exportability of these manufactured products. This may explain why resource abundant countries like Nigeria, Zambia, Sierra Leone, Angola, Saudi Arabia, and Venezuela experienced lower growth rates than resource poor countries like the Asian tigers: Korea, Taiwan, Hong Kong, and Singapore. However, the Dutch Disease fails to explain why there is such growth variation *between* resource rich countries.

Botswana, Canada, Australia, the United Arab Emirates and Norway are all examples of resource rich countries that *have* seen the rapid growth of their economies.

For both the United Arab Emirates and Norway, their growth is linked specifically to their oil exporting activities. To explain the difference between resource winners and losers Ding and Field (2004) use World Bank data on national capital stocks to find that countries with resource endowments have positive economic growth, while countries that are resource dependent experience negative impacts on growth. This paper links the above factors of the broader resource curse literature specifically to the economic success of two petroleum exporting countries which ultimately seem to emphasize the importance of economics over policy.

## Research Design

In terms of gross domestic product (GDP) Norway far outranks Ecuador. Both before and after the discovery of oil Norway had a higher GDP (by orders of magnitudes) and grew at a faster rate than Ecuador did. The two countries are clearly diverse in terms of development. The following graph shows the GDP in constant 2000 USD from 1960 to 2008.

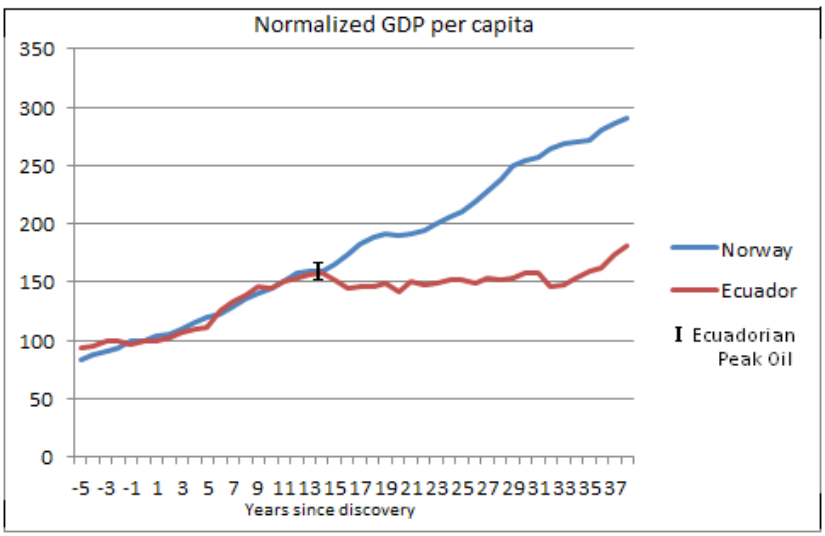



An important aspect of this graph is that both countries demonstrate steady growth rates. Most importantly, it is clear that Norway had and continued to drastically

outperform Ecuador economically. This should not surprise anyone familiar with international economies. What should surprise the reader is what is found in the following graph. The following graph attempts to control for prior economic performance and country size, while displaying the growth trend since the discovery of oil. For these reasons the dependent variable Gross Domestic Product per capita is used. The World Bank defines Gross Domestic Product per capita as follows:

> "GDP per capita is gross domestic product divided by midyear population. GDP is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources."

The GDP per capita used in this analysis is taken from World Bank national accounts data, and OECD National Accounts data files. It is measured in Constant 2000 United States dollars. The following graph shows a comparison of growth rates between the two countries based on gross domestic product per capita data.




The above graph was normalized using the base year: year of discovery. The year of discovery for Norway is 1969 and is 1967 for Ecuador. Normalizing has the effect of eliminating differences of prior economic performance allowing the graph above to display a comparison of growth rates in relation to their respective oil discovery dates.

What is quite shocking here is that Ecuador actually models the Norwegian growth trajectory until the 14th year after Ecuador's oil discovery. This is the year Ecuador reached its peak oil.

According to Ding and Field (2004) a resource dependent Ecuador should not have modeled the growth rates for the resource endowed Norway. Ecuador had less oil, was more resource dependent, and had a low income economy. All these economic indicators should suggest negative growth or, at least, low growth but instead, we see the above performances. Why might this be the case? After justifying the case selection, the remainder of this paper will attempt to determine what produces this similarity among such dissimilar countries.

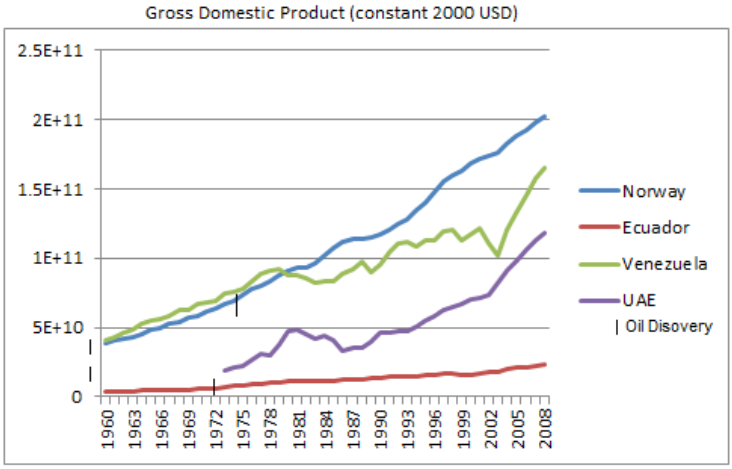
## Case Selection

This paper uses the method of agreement as prescribed by John Stuart Mill (1843) to compare the selected cases of oil discovery. The method of agreement looks for a common factor in all the cases where the effect occurs. For this study the factors are oil discovery, year of discovery, the international price of oil, economic development prior to and during oil exporting years, regime type, and production model. The effect is GDP per capita growth. The subjects of this study are Ecuador and Norway.

*Criteria One: Resource Impact and Economic Performance*

The cases selected are vastly different, but they have several features in common that make them comparable. Stevens (2003) identifies 55 countries in which resource export revenues exceed 30% of merchandise exports. Both Norway and Ecuador make this list. Stevens identifies Norway as one of seven countries which have beaten the resource curse; Ecuador is not identified as a winner. Yet, both countries have had more

stable growth as compared to other oil exporting countries. In addition, increases in growth are more notably related to oil. For comparison, the following graph shows the gross domestic product of four well-known oil exporters.



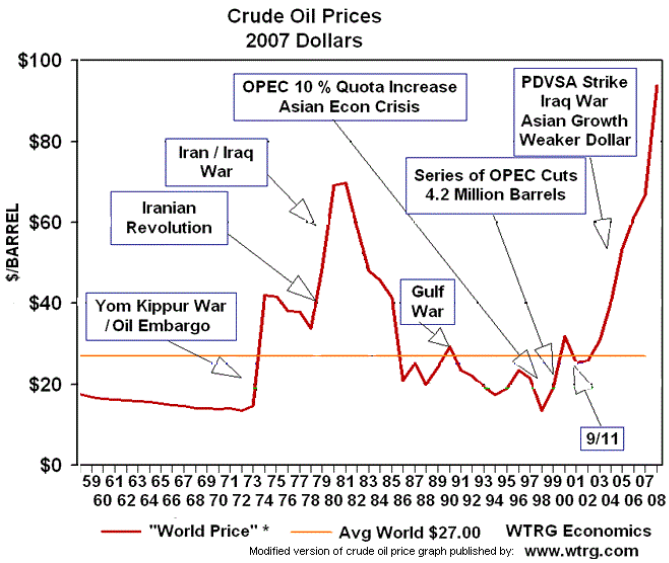

Oil onset is marked by a short vertical line. For both Venezuela and UAE oil discovery was made before the data begins. Karl's theory seems to play out in these two cases, where long standing traditions of the interaction between oil wealth and institutions have created precarious economic situations. On the other hand, both stability and increases in growth as it relates to onset of oil wealth, is visible for Norway and Ecuador. It is obvious from the above graph that this study investigates the extremities of the rich and poor among resource impacted countries. The following three criteria do not relate to rich and poor and offer more evidence that the comparison can and should be made between Ecuador and Norway.

*Criteria Two: Oil Prices*

The two countries discovered their oil in the late 1960s just before the first major spikes in oil prices and began producing and exporting their crude in the early 1970s during the price increases. The international petroleum market is a very complex market. Economic policies of countries worldwide affect the international price, different grades

of crude demand different prices, and conflict (both international and domestic) is also a huge factor in international oil price. It is for these reasons that the same time frame must be used to analyze the effects of petroleum income on a country.

The timing of discovery and development policies will greatly affect how much revenue a country can extract from their natural resource. The Yom Kippur war of 1973 and the Arab oil embargo spiked the international price for oil right after the two countries began to sell their oil on the international markets. The following is a graph of the average oil price over time.




The graph shows a large upshot in oil price in 1973. This is a product of the Arab oil embargo. The Arab oil embargo was a result of the decisions made by the Organization of the Petroleum Exporting Countries (OPEC) which was established by Iran, Iraq, Kuwait, Saudi Arabia and Venezuela in 1960. One year before the 1973 oil embargo, in 1972, Ecuador began producing oil. Norway began producing in 1970 but would not become a top producer until 1975. Karl (1997) explains that during the 1970s industrialized countries, which were faced with the first energy crisis as a result of the embargo, feared the wealth and power oil exporters were acquiring would alter power

structures and allow the exporters (OPEC in particular) to become the bankers of the world. The result has not been nearly as dramatic. The Arab oil embargo had ended by 1974 but the embargo left the price at new high which all two countries enjoyed during their early exporting years.

Embargoes cause artificial price increases for all exporting nations because the supply shortage increases the price on the international market. From 1970 to 1974 government revenues of OPEC nations on average grew eleven times over (Karl, 1997, p.2). Norway was not a member of OPEC. Ecuador joined in 1973 only to withdrawal in 1992 over membership dues.[1] However, regardless of OPEC membership status the price shocks provided additional revenue for all oil exporting countries. Unfortunately for OPEC nations and oil-exporting developing countries alike, dreams of utilizing that enormous transfer of wealth to significantly alter their economic trajectories had failed even before the price plunges of 1983 (p.3).

*Criteria Three: No domestic experience*

Prior to the late 1960s, Ecuador and Norway had no known oil reserves and no oil exporting experience. The importance of these criteria cannot be understated, at least in terms of policy decisions. This criteria is used to separate incremental policy development from deliberate policy planning done at time of discovery. In other words, countries like the United States, Mexico, Venezuela and Middle Eastern producers who had discovered oil reserves in the early 1900s have incrementally developed their oil policies over the past century often unaware of the effects such a resource would produce. The theory of the paradox of plenty (Karl, 1997) is most applicable in these cases, where state building and the creation of institutions coincided with incremental

[1]As of 2007 it has rejoined OPEC. *Source:* OPEC*: Brief History* <http://www.opec.org/opec_web/en/about_us/24.htm>

discoveries of oil. Such an early discovery meant that these countries developed demarcated production models that encourage poor practices like giving too much autonomy to multinational production companies, faulty investment strategies, or overspending.

By1970s, the world's dependence on oil would be well known. Because of this knowledge Ecuador and Norway were presented with the opportunity to alter course and deliberately choose a policy more beneficial to the country. They were provided the opportunity to gather knowledge about oil exportation and its effects from countries that had produced oil for extended periods of time. Because they had no known oil reserves, Ecuador and Norway had no exporting experience. Exporting experience means two things: first, experience with the relationship between government and production companies and second, national human capital that could be employed to produce the country's oil. Both countries were faced with immediate deliberate decisions about how to control oil reserve development and how to incorporate the resource rents into their national economies. This deliberate decision-making was not available to the countries which discovered their oil deposits early and incrementally.

*Criteria Four: Independence*

Finally, at the time of discovery each country was independent. This is important because many oil exporting countries discovered their oil under colonial rule and therefore had their initial oil development policies dictated to them. In some cases countries with early discoveries had their policies decided for them by the great powers of the early twentieth century. One example is Venezuela.

When oil was discovered in 1922, Venezuela's dictator, General Juan Vicente Gomez, allowed the oil companies of the United States to dominate the decisions

regarding Venezuelan petroleum laws. Yergin (1991) says General Gomez used Venezuela's oil wealth for his own personal enrichment. In1935 when General Gomez died and the ruling party (which was born out of the "Generation of 1928" activists) renegotiated the oil policy. Their renegotiations resulted in "fifty-fifty" principal. Government would take equal percent of the profits the companies made from Venezuela oil. In effect they were equal partners and the country was able to regain some control. In 1943 it was considered a landmark event, but it took over twenty years for Venezuela to regain control of its own resource. Mexico which discovered oil in 1901 is another example of an incremental process of policy development, and Libya, whose oil exploration was led by British efforts in the 1950s, is yet another example. This paper will discuss how the independence of the three countries allowed them to choose their own production models and in the case of Norway: invent a new one.

## The Qualitative Analysis: Compare and Contrast

### *Ecuador*

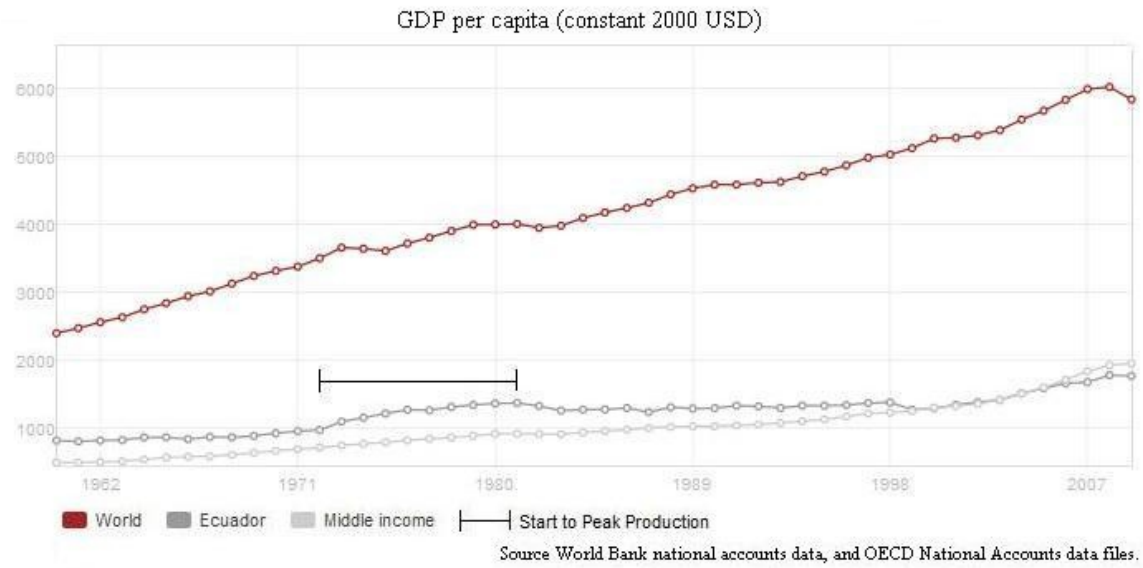
*History*

Throughout the twentieth century Ecuador became very familiar with the booms and busts of maintaining a large exporting sector volatile to the international markets. In the beginning of the century Ecuador was reliant on a powerful cacao exporting sector. By the 1950s Ecuador had replaced cacao exports with banana exports. As a result of the export dependent economy the banking system expanded. In 1970s oil dominated the Ecuadorian economy as the primary export.

Ecuador was a country prone to political instability. Between 1925 and 1947 twenty-three governments cycled through the Ecuadorian capital. In 1970, two years after

the discovery of oil in Ecuador, the ruling president, Velasco Ibarra, declared a dictatorship. In 1972 Ibarra was removed by a military coup. The military government was self-described as the “revolutionary nationalist” government and General Guillermo Rodriguez Lara presided. Ecuador would draft seventeen constitutions by the time the military would turn the government back over to democratic civilian rule in 1979 - just two years before Ecuador reached its peak oil.

In Latin America, during the 1960s and 1970s, military dictatorships were not uncommon. Ecuador (with Peru) would eventually be among the earliest of the Latin American countries to democratize but the Ecuadorian oil boom years were administered by the military dictatorship. The following graph demonstrated Ecuador’s GDP per capita as compared to other middle income countries from 1960 to 2008.




*Oil Policies*

In the mid-1970s Ecuador was “a country in which the petroleum industry enjoy[ed] hegemony over the economy, both in terms of national development and as the primary generator of revenue” (Martz, 1987, p.3). During the 1970s petroleum was responsible for three-fourths of export revenues (Corkill, 1985). General Lara expounded

the idea that because the oil belonged to the state all citizens should benefit from its profits. The military government wrote extensively on oil for development in the *Philosophy and Action plan of the revolutionary nationalist government of Ecuador.* Additionally, Lara established *The Comprehensive plan for transformation and development 73 – 77* which would use oil revenue to pursue development in three ways: national integration, improvement of living standards, and more economic output through more rational use of resource (Martz, 1987). On March 27th 1972 Ecuador established the Comision Asesora del Despacho Ministerial en Ausntos Relacionados con Politica Petrolera (Minister's Advisory Commission on subjects related to Petroleum Policy). It was the advisory committee to Captain Gustavo Jarrin, the new minister of natural resources and tourism. Under Jarrin Ecuador established the state oil company Corporacion Estatal Petrolera Ecuatoriana (CEPE), the National Development Fund, and the Ecuadorian Development Bank. Similar to the praise that Norway receives today, the World Bank in 1974 highly praised Ecuador's resource ministry and noted that the "management of petroleum resource has been remarkable" (Martz, 1987, p.102).

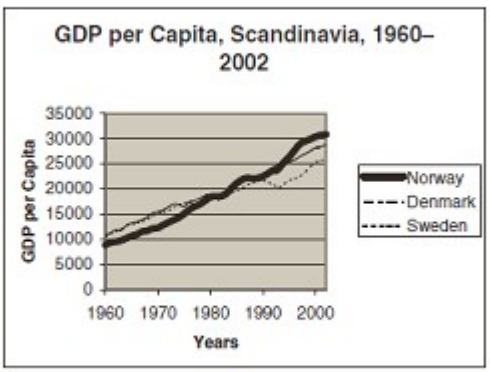
## ***Norway***

*History*

Before the discovery of oil Norway's economy was stable, its GDP per capita was above the world average and over 95% of its power needs were met by hydroelectric power. In resource curse literature Norway is frequently cited as the successful example of escape from the resource curse. This is often after establishing that Norway was trailing behind its Scandinavian neighbors before the discovery of oil and then grew to surpass those neighbors shortly thereafter. The following figure from Larsen (2004)

shows this change in gross domestic product per capita for Norway and its Scandinavian neighbors.

GDP per Capita, Scandinavia, 1960–2002, 1999 USD, PPP




*Note*: Data from Bureau of Labor Statistics (2003), Table 1.

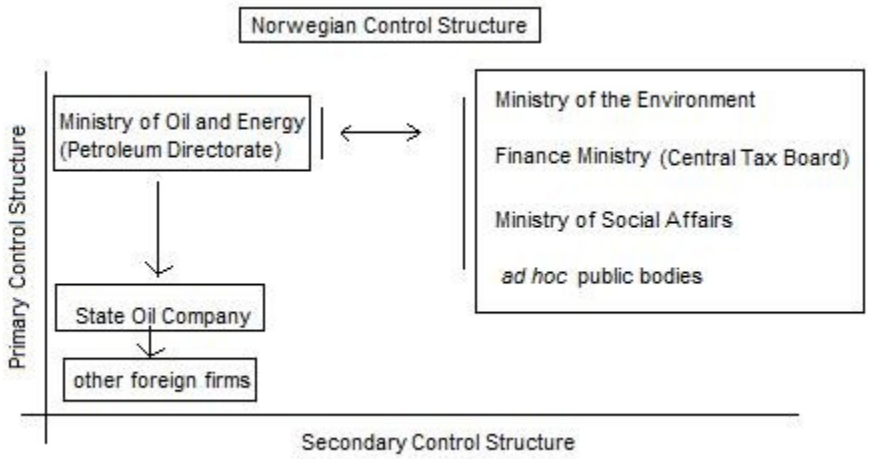
Source: Larsen (2004)

For Norway, it appears that petroleum has been a blessing. Policy was intensely managed by Storting, the Norwegian parliament. Parliament was established in 1814 by the Norwegian constitution, which is the second oldest single-document constitution functioning in the world today. In other words, Norway had a long standing stable governing structure well before oil was discovered. Additionally, Norway had a strong, well-educated civil society and Norwegians, says Noreng (1980), were a people prone to taking risks. Since the discovery of oil Norwegians have not only benefited from the state's management of resources, but have also profited from secondary industries in which they have personally created or invested.

*Oil Policies*

The Norwegian government had a long history of intervention in economic activity so it comes as no surprise that government regulation of oil policy was deliberate and highly-controlled. The parliament was also in a good position to take their time developing policy because (as aforementioned) energy needs were being met by

hydroelectric power. In the beginning policy was handled by existing bureaucratic organs and the Ministry of Industry made policy decisions. When major quantities of commercial oil were discovered in Norway, reorganization of the existing resource control structure was recommended and the result was profound. A Directorate with a special department of oil and mining was established and was supervised by the Ministry of Industry. Then in 1978 a new ministry, the Ministry of Oil and Energy, was founded. The following figure depicts the Norwegian policy control structure.




The reorganization established a vertical control structure. Within this structure primary decision making is done by the Ministry of Oil and Energy and direction is then handed down to the state oil company which directs others. A secondary control structure is horizontal and it allows for communication and policy decision making between the ministries. The Ministry of Oil and Energy is almost entirely devoted to policy and the secondary body, the Petroleum Directorate, wields control. The relative autonomy given to the Petroleum Directorate is to ensure that political pressures of the ministry do not hinder control and collection of information.

## Results

*Theory of Escape 1: Rich v. Poor countries*

In 1967 when oil was discovered in Ecuador, it was hailed as the country's saving grace. Ecuadorian production began in 1972 and the first barrel of crude was paraded through the town and set atop a monument. The public was well aware of its presence. Ecuador quickly sought to use its new wealth to fuel development and lift the country out of poverty. Since the discovery of petroleum, Ecuador has almost exclusively linked its development policy to petroleum rents.

Conversely, John Ausland (1979) writes that "Norway stumbled into becoming an oil nation. The transition went practically unnoticed by a people preoccupied with the debate over membership in the Common Market" (p.1). In Norway, the government was aware of the effects the oil wealth could have, but the Norwegian civil society was less interested than the Ecuadorian public. The discovery of oil in Norway came at a time when the resource was thoroughly pursued by the international community (particularly by western industrialized countries which feared the new power of OPEC). The international interest in Norwegian oil and the economic conditions in Norway, afford the privilege of deliberate planning and minimized risk for Norway.

Ding and Field (2004) highlight the importance of resource endowment and resource dependence to economic growth. Ding and Field show that richer, more diverse economies experience positive growth. These are labeled resource endowed. Poor, single-resource dependent economies experience poor growth. These are labeled resource dependent. Norway is clearly an example of a resource *endowed* country. Hydroelectric power fueled the country and oil extraction was delayed until proper policy was established. Ecuador was clearly a resource *dependent* country. Economic development

was directly linked to oil revenues. However, the theory that rich can escape the resource curse while the poor cannot (which in this paper is summarized by the Ding and Field (2004) findings) appears to have a null effect, at least until peak oil.

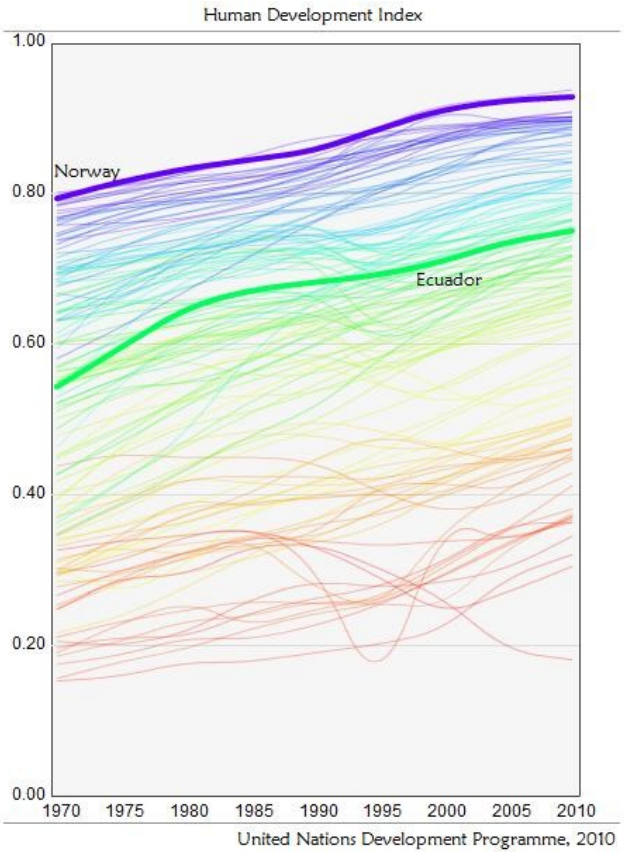
For Norway in 1968, one year before the discovery of oil, gross domestic product was 54 billion in constant 2000 USD. By 2008 (two years before Norway's estimated peak oil) it was 202 billion. In a little over thirty years Norwegian GDP has tripled. Ecuador discovered oil in 1967. The year before discovery (1966) Ecuador's GDP (in constant 2000 USD) was 4.4 billion. By the time Ecuador reached its peak oil in 1981 it had been exporting oil for nine years. In those nine years Ecuador had more than doubled its GDP to 11 billion constant 2000 USD. Today Ecuador's GDP is 23 billion USD. That's even smaller than Norway's GDP before oil exportation but still constitutes a *quintupling* of Ecuador's gross domestic product.

*Theory of Escape 2: Dictatorships v. Parliamentarian Regimes*

The theories of Mehlum et al. (2006) and Ross (2001) address the ways in which resources interact with institutions. Mehlum et al (2006) conclude that resource rents can be utilized by two forces: productive economic activities or elite enrichment. Ross (2001) findings are more significant in relation to the case studies of this paper. Ross (2001) finding's that globe oil impedes democracy and deteriorates democracy more in poor countries than in rich ones implies that regimes will use oil wealth to overturn democratic rule and consolidate power. However, the deterioration of democracy in Ecuador as a result of oil wealth was only temporary, and it can be interpreted that oil wealth may have actually assisted the "*retorno*" (democratic process).

In Ecuador the second military regime (1976 -1980) to operate under the oil exporting bonanza experienced one of the highest public sector growth rates in the developing world, Quito particularly benefited (Corkill, 1987). This can be intepreted as evidence that Ecuador did in fact use its oil wealth to consolidate power and impede the democratic process, particularly when we remember that Velasco Ibarra declared his dictatorship two years after the discovery of oil. Corkill (1987) postulates that contention among the banana-exporting elites from Guayaquil and the oil wealth in Quito made the democratization process in Ecuador only "partially successful" (p63). Given the above information public sector bureaucracy growth can be interpreted as power consolidation among the resource enriched regime and its supportive elites. However, if we consider that the military rule only lasted *five* years and ended before peak oil was reached, we might consider oil wealth as a tool in the democratic process and the public sector growth in Quito a step in this direction.

An indicator of second theory proposed above can be demonstrated using the Human Development Index. Stevens (2003), a survey of resource curse literature, proposes that resource curse analysis needs an additional measuring stick, one that goes beyond measuring economic welfare and measures "peoples' well-being" (p6.). Stevens (2003) uses the Human Development Index as prepared by the United Nations Development Programme. The following diagram shows the dramatic improvement in Ecuador's HDI rating during the oil boom.




The successful redistribution of oil wealth under the military regime is supported by the HDI findings. The Human Development Index ranking measures three factors which comprise a quality of life measurement. The index evaluates health, education and living standards using life expectancy at birth, mean years of schooling, expected years of schooling and gross national income (GNI) per capita. When the components are examined separately education factors and life expectancy improve even more than GNI per capita.[2]

During the oil export years, Ecuador's GDP per capita grew 8% per year. During the same ten years Norway's GDP per capita grew at an average rate of 3.76 percent (although it should be remembered that Norway needed far less GDP per capita growth). Ecuador's impressive performance in terms of the Human Development Index, its early

[2] See Appendix A for a further breakdown of the individual indicator contribution to the HDI Index

return to democratic rule (as compared to other Latin American countries) and its stable economic performance since peak oil should demonstrate to any critical observer that the ruling military regime did, in fact, implement policies contrary to those predicted by Ross (2001).

*Theory of Escape: Good v. Bad Production Models*

Karl (1997) proposes that resources shape institutions and often favor elite enrichment. Decisions, shaped by the rational actors who seek to improve their own political clout or personal wealth, often result in petrodollar dependent policies. These policies are often targeted at popular public works and consolidating power among the incumbency governments. They do not favor secondary industry improvement and state entrepreneurship. Where states direct resource rents is determined by government policy.

Government policy and development plans depend upon the ability for the government to plan for revenues. The ability to plan for revenues depends upon the production model used. Therefore the production model employed is arguably the greatest factor in determining future economic success. The governments of an oil producing country and private production companies have an antagonistic interdependency. The model a government chooses to employ will determine the degree of control over activity and the ability of either party to plan for the future. For the industry this is the ability to calculate profit returns on investment. For the government this ability determines calculations about the future of the national economy and implementation of sensible resource policy that will not deplete the resource too quickly. The relationship is governed by two factors: the division of monetary gain and decision-making control over the activity.

In the late 1960s oil extraction adhered to one of two models: the concessionary model and the state model. The concessionary model gave oil companies authority over their concession plot for the purposes of development and extraction, and government set taxation and royalty policies. In the state model governments retain control and organization of exploration and production planning. Generally this is done through an administrative agency or a state oil company or through collaborative efforts with contracted private firms. The Soviet Union, Romania and China employ state models that are organized through government agencies. In Mexico and Indonesia a state oil company (which operates under market forces) organizes production. The following chart shows the power distribution among the four contemporary production models.

**Production Model Structures**

| Participation of Private Companies | Degree of Centralization | Role of State Oil Companies: Dominant | Role of State Oil Companies: Absent |
|---|---|---|---|
| Direct | Low | North Sea Model | US Model |
| Indirect | High | OPEC Model | Soviet Model |

Adopted from Oystein Noreng, 1980

In the 1970s following the creation of OPEC, the international political economy of oil drastically altered course. Nearly all states employed direct state participation or full nationalization. Because Norway and Ecuador had no oil development experience they had the ability to choose from available models or develop a new one. Ecuador, like nearly all developing nations, began by employing the concessionary model and later nationalized the industry. Norway developed the North Sea Model.

In a traditional concessionary model, exploration, development, and depletion policy are decided almost unilaterally by the company award the concession plot.

Governments generally received a small share of rents of the oil based on company profit margins. This development style manifested because most oil companies' experience was developed in the United States (under strong *laissez-faire* tendencies) and later expanded to developing countries where government's ability to resist multinational influence was weak. Furthermore, until the oil revolution of the 1970s the control and taxation of an industry trading in integral networks was out of the reach of governments.

This interdependence between companies and government is always unstable. It changes based on the international context and government's acquired experience. Within the framework of the concessionary system, it often breeds its own destruction. This has been the case with many developing countries throughout history. In Ecuador it was certainly the case. Jarrin and his team set twelve policy objectives in their pursuit of sensible resource development. The very first objective set out to revise contracts and activate hydrocarbon laws; it would be the source of much contention. The Hydrocarbon law enacted October 1st 1971 by Velasco Ibarra was the first hydrocarbon law since 1937. It was not retroactive. This meant that 8,434,434 hectares in the hands of concession holders could not be touched. Some contracts had been negotiated to last until 2010 (Martz, 1987, p.102). However, as previously stated Jarrin's team succeeded in renegotiating concessions and returning 5,694,153 hectares to Ecuadorian control. This coincided with the creation of Ecuador's state oil company.

On June 14th 1974 Ecuador signed documents to purchase 25% of the Texaco-Gulf holdings. After the Ecuadorian government took over Texaco-Gulf holdings CEPE took on all the responsibilities of producing, transporting, industrializing and commercializing the crude oil. CEPE was in charge of the country's largest oil reserve

and set policy from the largest oil field. CEPE goals and activities were to expand substantially while the new five year plan was tied exclusively to petroleum revenue.

It is important to remember that the mere nationalization of a foreign-owned corporation does not guarantee economic benefit for the state government. The production policies of the newly formed state company and policies of collecting rents from the other multinationals in operation are still very important. CEPE struggled with its own capacities. It needed to borrow technological expertise from the same multinationals toward which it had recently been so unfriendly (Martz, 1987). In a system like Ecuador's, where the state oil company worked in cooperation with the multinationals, the capacity of the leading state company is an essential factor in the operation of the industry. CEPE limitations, then, were industry limitations. For Norway, the North Sea model corrected this problem. It provided private capital for exploration and lent expertise to the Norwegian production companies, all while Norway retained control over depletion policy.

*The North Sea Model*

In addition to the international interest in North Sea oil the Norwegian divergence from historical production models is probably due to the fact that Norway was a fairly developed democracy and with a history of strong government participation in economic welfare. Participation in economic decision making in the private sector was not new to Norway. Moreover, in Norway the government had an additional goal. They wanted to learn the microeconomic complexities of the industry, rather than solely manage the macroeconomic implementation of rents. Beyond the government's ambitions and economic management tendencies Norway presented two additional forces:

organized social interests and a consolidated trade union movement. All these factors contributed to the creation of the North Sea Model.

In the North Sea the allocation of concessions was not done through the traditional process of auction because it did not give the government enough control over the distribution process, and thus the concession system was discarded. The state system was also discarded because the government lacked industry knowledge and expertise and so the participation of private firms was a necessity. The North Sea model permits private companies the ability to directly participate in exploration and production, and gives them the right to dispose of the oil, but retains the right to assume production as the state oil company after 10 years of deposit development. Key features of the North Sea model include the contracting of private firms under state regulation, direct state participation through a state oil company, and the long-term ability to introduce additional taxes (Noreng, 1980). It should not be overlooked that the delegation of exploration and operation to private firms implies a degree of decentralization of the resources not found in the state model. Norway had to make the operation financially attractive to the industry.

The advantage of the North Sea model is that the direct participation of foreign companies lends experience and technology to the state as well as the utilization of private capital. The disadvantage however is that the state retains the right to manage the operations yielding cumbersome problems of control. Government creates a system of direction and regulation through complex legal proceedings to influence the microeconomic behavior of the foreign companies operating in their territory. This process has the potential to build inefficiencies and hindrances for the oil companies as a result of fickle or partisan political pressures. However, this process should not be seen as

entirely unattractive to the companies. In the long run companies should benefit from the security of a stable government and the predictability of enduring policy.

Unlike the North Sea model, which requires that multinationals lend their expertise and technology to the state, Ecuador's concessionary, and later state model, made Ecuador dependent on foreign expertise and technologies. Ecuador, like Venezuela, had to fight to regain control over concessions and policy. Furthermore, the North Sea model lent industry success to Norway because. As we have seen, Norway retains the right to operations after ten years of production. In addition, Norwegian law stipulates that Norwegian firms are to be contracted for secondary industry needs should the national firms be as efficient and cost-effective as outside firms (Noreng, 1980).

Ecuador, it seems, had no such stipulations for capturing externalities. However, Ecuador did successfully utilize rents for secondary industry assistance. Corkill (1987) writes that the Ecuadorian "state became a major economic entrepreneur and encouraged the import of high-level technology to establish a petrochemical industry as well as motor car assembly plants and other capital goods industries" (p64). According to this evidence Ecuador did not fall into a trap of relying on oil rents as the only source of income generation, and it did pursue the expansion of secondary industries. Most importantly, Ecuador was successful in growing its manufacturing sector. The manufacturing sector grew at an average rate of 10% and by the end of 1970s comprised 25% of exports (Corkill, 1987). Ecuador, it seems, did not suffer from the Dutch Disease, rather it operated contrary to Dutch Disease predictions. Despite model choice and Karl's prediction about resource rent usage, Ecuador seems to have made good policies decisions regarding rent re-investment. In 1974 Ecuador's GNP growth was the highest in

all of Latin America (Martz, 1987) which included several other oil-export dependent countries. Ecuador, temporarily, was a clear resource winner.

Karl (1997), if related to model choice, would propose that the institutional incentive structure would not favor secondary industry growth and state entrepreneurship. These results should be interpreted as evidence against the predictions of Karl (1997). There is also strong secondary evidence seen in the creation of the National Development Fund, the Ecuadorian Development Bank, and the Human Development Index improvement cited above. The creation of these entities also does not follow from the institutional rent seeking predicted by Karl (1997).

## Conclusion

According to resource curse literature, Ecuador is an example of a worst case scenario. It developed oil under a military regime and later a presidential system. It had a concessionary production system, and is a developing country. Despite these components Ecuador was one of Latin America's fastest growing economies in the 1970s and its GDP per capita model Norway's GDP per capita growth until Ecuador reached its peak oil. Moreover, unlike Venezuela and other resource dependent countries, Ecuador has had steady growth since it reached peak oil.

Norway is the exceptional case, and it is always cited in resource curse literature as the outlier. Its growth is impressive even at its already elevated level. The well-developed institutions of Norway coupled with its economic stability resulted in successful production and rent management. Furthermore, its parliamentarian system and almost non-existent corruption created a situation in which the government revenues could be equally distributed throughout the society. The overall capture of oil rents was

estimated in 2010 to amount to 50% which Norway considers a success (*from oil and gas*, 2009). However, until analysis is complete on a post-peak oil Norway we can only estimate that it has performed remarkably well.

As we have seen Ecuador was praised by the World Bank for its oil development policies, it lead the way in democratization in Latin America, and its drastic improvement in quality of life (as given by the Human Development Index) is impressive. However, by the 1980s Ecuador had entered into crisis. The gross domestic product growth decline, which fell by 3.3% in 1983, is cited by Corkill (1987) as the example of how "in retrospect oil wealth was mismanaged" (p64). He writes that the mismanagement took the form of rapid depletion of reserves, growth in domestic consumption (encouraged by unrealistically low fuel subsidies), an intensified dependence upon imported technology and foreign capital, vulnerability to multinationals, and corruption in the form of fuel smuggling to neighboring countries. Yet given Ecuador's overall steady GDP growth we can consider these effects to be low. Most importantly, the decline in the 1983 GDP cited by Corkill is most probably a direct product of oil price plunges of 1983, to which any oil-export dependent country would be incredibly vulnerable. Given that the case study results show that neither "rich or poor," "dictatorship or parliamentarian regimes," nor "production model" choice play a significant role in economic success during oil exporting years. A reader should question if the "winners" and "losers" of the resource curse should only be evaluated once they have reached peak oil. Peak oil seems to be the most significant factor contributing to Ecuador's deceleration in growth rates.

An even more compelling argument for evaluation of performance post-oil is the evaluation given by Larsen (2005). Larsen (2005) concludes "Norway might have escaped the curse. However, data suggest a slow-down at the end of the period, opening

the possibility of a late onset of the curse." Larsen concludes "if so, rich countries are not immune" (p75). The implications of a Norwegian slow-down after peak oil might suggest that resource export is almost never advisable.

Norway reached its oil peak in 2010 and time will only tell if it has recaptured enough of the rents in the international financial market to justify the extraction of its oil. One benefit that may sustain the Norwegian growth trajectory is that Norway did a superb job of developing vertical integration of its oil industry and capitalizing on the positive externalities, such that Norwegian firms in 2009 were contracted to contribute to the deep sea extraction activities of the Russian oil in the Barents Sea.

I suggest further research in regards to the production model used in Norway, because if Norway sustains its economic trajectory after peak oil it will most likely be a as a result of the new model it developed. This is because Ecuador seems to have been comparatively successful despite every other prediction of resource curse literature investigated in this study. As we have seen Ecuador was not able to maintain GDP per capita growth as compared to Middle income countries. However, its convergence to the middle income trajectory may be explained by Sachs and Warner (1997). More research is needed to determine if this is feedback from poor model choice.

Given this findings of this study several key questions remain. Was Ecuador truly implementing "poor policy" or did Ecuador just simply run out of oil earlier? Will Norway converge to steady state equilibrium or has it 1) controlled the effects of income booms and 2) recaptured enough of the rents in the international financial market to justify the current exporting practices? Most importantly, should Norway emerge a "resource loser," resource curse literature will be forced to answer the question of whether resource exportation is ever advisable. If however, the future should prove that

Norway's practice did in fact enable it to beat the resource curse, then future research should focus on the possibility of applying the Norwegian production model to developing countries.

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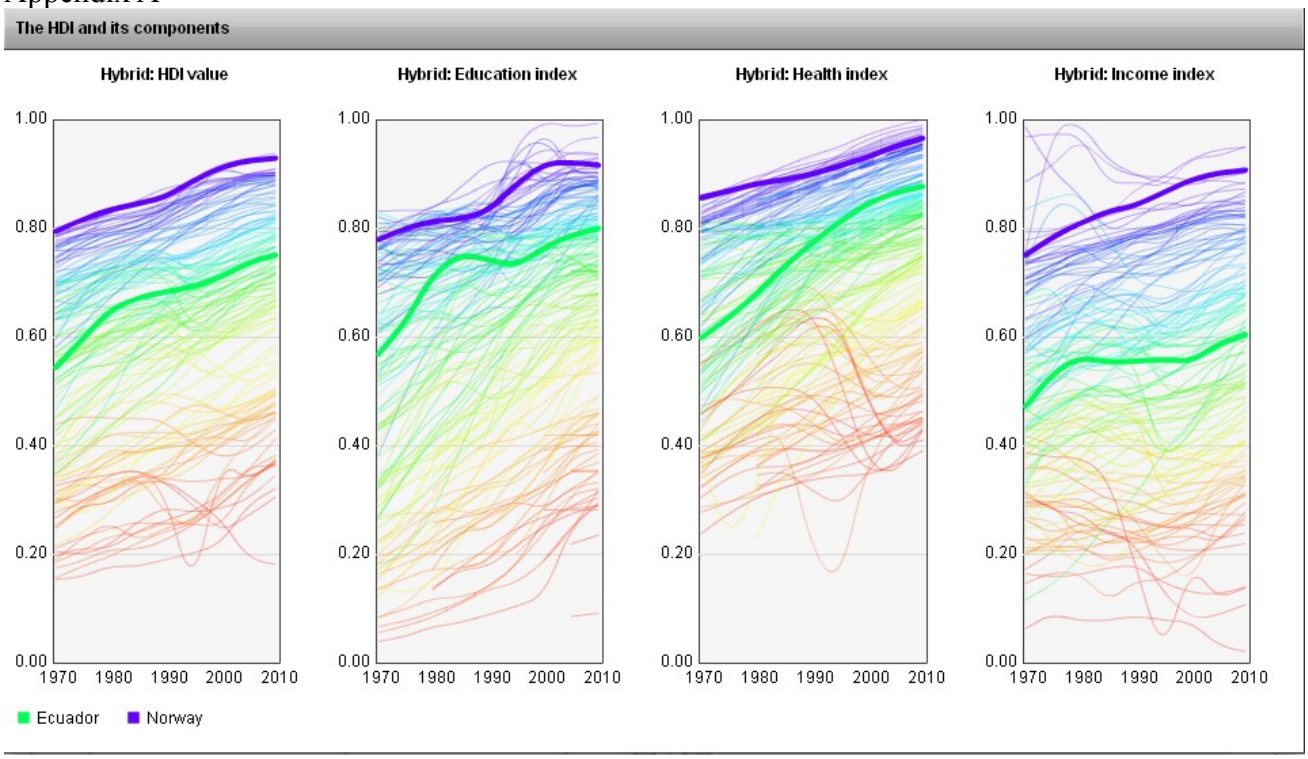
Appendix A


The HDI and its components
Hybrid: HDI value
Hybrid: Education index
Hybrid: Health index
Hybrid: Income index
1.00
0.80
0.60
0.40
0.20
0.00
1970
1980
1990
2000
2010
Ecuador
Norway