

Trade and the Energy Sector: An Evolutionary Perspective

Hot tips for Mexico

Two essays published in the weekend edition of May 22-23 of *The Wall Street Journal* offer points of departure for a fresh review of the history and dynamics of the energy sector in Mexico.

WHY HUMANS TRIUMPHED

In his essay, "Humans: Why They Triumphed," Matt Ridley, a writer on evolution and genetics, asks about the technological explosion that took place 45,000 years ago and makes a new case for the ideas universally taught by economists that are known as "the theory of comparative advantage."

The Upper Paleolithic Revolution

Tool-making had been going on for two million years, but with few signs of technological advancement. Then, roughly 45,000 years ago a burst of innovation and creativity took place. The essayist asks, Why?

*Sex is to biology as
trade is to culture.*
--Matt Ridley

Mr. Ridley argues that the explanation is to be found in the appearance—not of genius—but of trade, understood as a by-product of population density and specialization. As the exchange of DNA powered anatomical, "autoplastic" evolution, the analogous exchange of ideas, goods and services powered technological, or "alloplastic," evolution.¹

Specialization, in turn was forced upon individuals—and, eventually, upon whole economies—by a "collective intelligence" that understood that complexity and productivity were enhanced by a division of labor and by the exchange of people, ideas and goods.

From this rough (and rough-edged) framework, the evolutionary importance of trade may be seen in the emergence of the great trade-obsessed cities. In the ancient world, there was Tyre, Alexandria and Babylon. In the Renaissance and early modern period, the main trading cities were Venice, Sevilla, Amsterdam, London and Paris. In contemporary times, new trading cities include New York, San Francisco, Chicago, Houston, Tokyo, Hong Kong and Singapore.

*"The great trading
cities had well-
endowed collective
brains."*

The author's general argument is that such cities had a critical mass of collective intelligence of a character that was both distributive and cumulative. An additional observation would be that such cities were not only centers of commerce but also of centers of learning, science and the arts.

Why technology did not advance in some areas

Mr. Ridley cites the example of Australia, where modern humans arrived some 20,000 years ago—before, he notes, their arrival in Europe. Despite their early beginnings, cut off from trade routes, technology stayed at the primitive hunting and gathering level for milenia.

He also notes that the level of technology in some areas may retrograde.

TRADE AND THE AMERICAS

We may apply some of these ideas to the history of the New World. Humans followed animal herds across the land bridge between Siberia and Alaska during a period that ranged from 40,000 to 17,000 years ago; but, in the process, human groups lost their trade connection with the Old World. Until the Europeans arrived, the peoples of the Americas were unaware of the two critical inventions that had been responsible for most of Western development since Egyptian times: the wheel and the arch.

In Mesoamerica (an area that includes Mexico and Central America), the high point of cultural and technological advancement had taken place hundreds of years before the arrival of the European: the great cities and ceremonial centers of Monte Albán, Palenque, Tikal and Teotihuacán had been reclaimed by the forces of nature. There was no living memory of the accomplishments of the Mayas in mathematics, astronomy or written texts, nor of the Olmecs and others in the art of stone-carving.²

There was limited trade in the Classical Period, going as far sought as Guatemala (and possibly as far south as Peru); but there was insufficient cross-fertilization to create a sustainable and cumulative body of knowledge and a culture and political system to preserve it. Upon their arrival, the Europeans had no idea that there had been a huge—desastrous—retrograde in Mesoamerican technology, and that advanced scientific and engineering knowledge had been lost on a massive scale.

What the Europeans found in Mexico was a species of “cold war” between the dominant Aztec federation based in Mexico City and the surrounding tribal kingdoms. Thus, Hernán Cortés was able to defeat the Aztecs on the battlefield but only with the help of thousands of warriors from neighboring Tlaxcala.

*The government
took the sex out of
the oil industry.*

By the end of the 16th century, having established their colonial empires, the Iberian governments sought to limit trade in their colonies to the home country; the effect of this policy was to further retard the cross-fertilization of ideas—and its by-product, technology, between Europe and Ibero-America.³

Concerning mineral rights, the Spanish Crown claimed original ownership, and required that their exploitation by private parties be carried out only with a royal concession. Silver was Mexico’s chief export.

EARLY MEXICAN EXPERIMENTS IN TRADE AND INVESTMENT

With independence in 1821, Mexico had very little experience in trade, technology or innovation. One idea was to invite Anglo-American immigrants to Texas, but the experiment ended badly for Mexico, when, in 1836, the colonists declared their independence from Mexico. The situation soured further when, in 1844, the lands formerly belonging to Mexico were annexed to the United States, thereby destabilizing the region. To Mexico’s strategic surprise, the liberal government of the United States—the model for Mexico’s presidential, bicameral constitution—invaded Mexico in three military campaigns. Mexico City was captured after an amphibious assault that had not been attempted since the time of Cortés over three centuries before.

The country was on the edge of collapse (Yucatán was seeking independence). To avoid the risk of a permanent military occupation, the Mexican negotiators ceded the northern half of the country to the United States in the so-called Treaty of Guadalupe-Hidalgo, signed Feb. 2, 1848.

Fifteen years later—not quite a generation—Mexico’s economy and political system would be rocked again by a French-backed regime headed by Maximilian I and Empress Carlota.

THE FIRST SUSTAINED TRADE AND INVESTMENT POLICIES

Porfirio Díaz, from indigenous roots in Oaxaca, was a general in the war to drive out the French; he later seized the presidency and held on to it for three decades, surrendering it only in 1910 when revolution threatened. Surrounded by a group of liberal thinkers—nicknamed the “científicos”—, Díaz set in motion policies that brought in European, American and Canadian investments on a large scale in railroads, mining, electric power and oil.

Breaking tradition with Spanish law, Díaz offered mineral rights to the surface owner of the land, as was the practice in the United States. As a result of this policy, the Mexican oil industry was launched, albeit with shortcomings that, within a generation, would again lead to a technological retrograde. The framework that Díaz constructed did not provide for checks and balances or for what, today, would be called “national content.” He did not establish a regulator and transparent fiscal system, require joint ventures with local capital or control the labor unions. As one outcome, decisions with long-term effects would be driven by short-term politics.

With the decision of Lord Admiral Winston Churchill to switch the British navy from coal to oil, the strategic importance of Mexico in British national security policy rose. Mexican oil, it is said, fueled the British navy in World War One. By 1921, despite a decade of revolution, Mexico was the 2nd-ranked oil exporter in the world.

THE SECOND RETROGRADE MOVEMENT IN TECHNOLOGY

The expropriation of British and American oil interests in Mexico on March 18, 1938, may—or may not—have been a decision that strengthened the political independence of the country; but, in relation to the process of cross-fertilization of ideas, technologies and practices, Mexico by 2008 would lose not only three generations of intellectual capital but the institutional vehicles of innovation—namely, the oil companies as investors, partners, employers and conversationalists.

In the decades following this decision, the government established a “Closed Door” policy regarding investments and joint ventures. The effect of the expropriation and subsequent policies has been to retard the development of trade, innovation and technology.

HOT TIPS FOR MEXICO

In Mexico’s oil industry, technological and economic development has been held back by these self-imposed limitations on trade, broadly understood. Here are six ideas for increasing the trade of ideas, and, with it, commercial intercourse and innovation.

1. Increase the gene pool

When oil companies with global ambitions higher technical and managerial staff for career positions, they look to the global labor market, irrespective of nationality.

In Mexico, by contrast, there are three filters, the first of which is nationality. With numerically insignificant exceptions, Pemex career opportunities for engineers and earth scientists are limited to persons holding Mexican passports. A second filter is education: The preponderance of engineers come from just two institutions: the National University (UNAM) and the Polytechnical (IPN). A third filter is family connection: It is much easier for a job applicant with the surname García Luna to be hired in Pemex than for anyone surnamed García Baker.

These three limitations reduce the intellectual gene pool in Mexico by a factor of at least 10 (that is, supposing that gene pool size may be indirectly measured by the ratio of the water depth of oil production in Mexico and abroad.)

2. Increase the number of trading partners

The self-imposed restriction on joint ventures on both the oil and power sides of the energy sector means that real learning that is both collaborative and democratic does not take place. Formal technology-transfer requirements do not teach anyone how to run the business or to make critical decisions in real time.

3. Require English for hiring and promotion

The top three levels of the state energy companies speak English, the de facto language of the global oil and power industries; but the people at these levels account for considerably less than 5% of the workforce. The federal government and state agencies outsource English-language translators and interpreters, sometimes with embarrassing outcomes.⁴

4. Attend the OTC in greater numbers

The Offshore Technology Conference (OTC), held in Houston each May, is an orgy of cross-fertilization of ideas, technologies and approaches to problem-solving. Pemex would benefit would be in sending 100 mid-career professionals in engineering, earth sciences and management; but the problem—besides the official one of budgetary limitations—is the lack of English preparedness. (Typically, Pemex sends 10-15 executives to OTC.)

5. Adopt the best regulatory oversight practices available globally

There are no data to measure the degree of regulatory oversight of one oil company compared to another; but a guess would put Pemex in the lowest quintile. In the Energy Reform of 2008 the government took a few timid steps that may—or may not—be taken as an intent to bring its NOC under effective, market-driven oversight.

At present, in the upstream, there is no regulator that, independently, administers contracts with IOCs for the exploration and development of the country’s petroleum endowment. As for the midstream in oil products and despatching in power, to fulfil its legal—and moral—mandate, the Energy Commission (CRE) is forced to row furiously against the currents of vested interests and government inattention.

*CRE vs.
Status Quo*

As for the downstream in oil products and distribution in power, the government maintains a full set of price controls that, together, sharply limits investment, innovation and the growth of the collective brain trust.

6. Change, gradually, the national narrative about energy

Mexico has both under-invested in the energy sector—as seen in policies that have retarded trade and the cross-fertilization that goes with it—; but, simultaneously, Mexico has over-invested in the symbology and mythology of the oil and power industries. The exalted symbolic status according to Pemex and CFE (and, before its dissolution in 2009, to LFC), rewards a self-limiting ideology over trade and innovation.

To act on this tip, however, will require political leadership not presently found in Mexico. In this regard, an observation published in 1992 remains valid today: “It would be risky for highly qualified persons in Mexico to participate publicly in a serious reassessment of the oil sector.”⁵

OBSERVATIONS

1. Matt Ridley ends his essay on an optimistic note.⁶ The Internet, he imagines, will bring with it a new level of global cross-fertilization of ideas, and, with it, new technologies and economic development.
2. If only this prediction were true. Rulings in 2010 by the governing body of that oversees Internet domain names approved non-Latin scripts, effectively retribalizing the Internet. Culture, the evidence suggests, is still more powerful than the sexiness of the Internet.
3. Most of the world’s oil is controlled by states who seek, not market liberalization, but stronger political control and national, and international, influence. For such states, the Internet will be mass entertainment at best, a nuisance at worse.⁷
4. Mexico is one of those countries for whom political control of the oil industry is more important than market efficiencies.

Culture is more powerful than the Internet.

CONCLUSIONS

The pro-trade future of Mexico’s energy sector (in the larger sense spoken about here) may belong to the cohort of English-speaking professionals in their mid-thirties and early forties who are found today in a few offices and departments in the federal government and state energy companies. The CRE and Hydrocarbons Commission (CNH) are two examples where such cohorts may be found.

That the CRE sent a delegation to an industry conference held in Houston in March 2010, and that CNH sent a delegation to OTC 2010 are promising signs.

George Baker

¹ The terms “autoplastic” and “alloplastic” were coined by the late Weston LaBarre, a cultural anthropologist at Duke University.

² And the language, culture and political system of the society that invested decades in the construction of the so-called Sun and Moon Pyramids in Teotihuacán (all Spanish labels, incidentally) are unknown to archeologists.

³ The late John Tate Lanning, a colonial historian at Duke University, estimated that there was about a generation lag between ideas in biology and medicine in Europe and their adoption in the curriculum in colonial universities.

⁴ Yahoo! News. “Calderón Visit Marred by Poor Translation,” May 19, 2010. The decorum of the visit of President Felipe Calderón to the White House was marred by a Mexican translator whose rendition of the President’s remarks was unintelligible.

⁵ George Baker “A Cost-Benefit Analysis of the Oil Sector in Mexican Society,” p. 298. In Jonathan C. Brown and Alan Knight, eds. *The Mexican Petroleum Industry in the Twentieth Century* (Austin: University of Texas, 1992).

⁶ The arguments by Mr. Ridley are more heuristic, that is, suggestively instructive, than factual. The notion of a “collective intelligence” cannot be established empirically. There seem to be other factors at work: thus, the idea of “cumulative knowledge” seems to imply schools, teachers and a system of education and apprenticeship. The essay does suggest ideas that are applicable to the Mexican case, such as the loss of technology and the negative multiplier effects of trade limitations.

⁷ *Wall Street Journal*, May 22-23, 2010. “The Long Shadow of the Visible Hand.”

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