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THE HISTORY OF FINANCING INFRASTRUCTURE IN AMERICA: PRACTICAL IMPLICATIONS FOR INDONESIA

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THE HISTORY OF FINANCING INFRASTRUCTURE IN AMERICA: PRACTICAL IMPLICATIONS FOR INDONESIA

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The History of Financing Infrastructure in America: Practical Implications for Indonesia

Objective: Using Historical Experiences for Contemporary Policies

The objective of this paper is to provide a historical perspective on the policy implications of financing infrastructure development and its relationship to the growth of a national economy. This paper will use the development and financing of canal and railroad infrastructure in the United States and its correlation to the advancement and expansion of the US economy as a basis of comparison. We hope to cite examples of successful and failed policies that will benefit Indonesian policy makers charged with the dual responsibility of guiding Indonesia's future economic growth and development and expanding its infrastructure base. The lessons discussed throughout this paper are directly applicable to the environmental infrastructure sector in Indonesia.

The Problem: Developing Alternative Solutions to Infrastructure Problems

The Government of Indonesia (GOI) is currently challenged with a dilemma that other developed countries have confronted during the transformation of their economy from one of centralized government management to one based on international market principles. The infrastructure base is not adequate to fully support government plans for growth and development, and the traditional means of infrastructure development limit the ability of the government to do the job alone.

Successful efforts to finance and build essential infrastructure can put in place a solid foundation for sustained growth and development. Without infrastructure, development will surely lag and economic growth will be constrained. The financial mechanisms created to finance infrastructure are also of great importance. If scarce financial resources are allocated to poor projects, economic and employment growth will be impeded and macro-economic conditions could be adversely impacted.

The demand for infrastructure and the need for new sources of financing to support its development have begun to overwhelm the capacity of government to build infrastructure using conventional approaches. Indonesia has moved rapidly to support alternative means of infrastructure development using an array of private sector resources to supplement its existing mechanisms for building infrastructure. Government leaders are aware that if they are unable to accelerate the pace of infrastructure development, the economic consequences will not be favorable.

Purpose of the Paper: Discuss Historical Case Studies and Extract Lessons with Contemporary Implications

There are a multiplicity of issues that impact on economic transformation. This paper will focus on the benefits and pitfalls of financing various types of infrastructure needed to facilitate economic transformation. We will review historical evidence by focusing on case studies in the American canal and railroad sectors and extract lessons that can be

applied to current issues in infrastructure finance in Indonesia. More importantly, if previous experiences are incorporated into current policies and implementation procedures, past mistakes can be avoided and financial resources can be employed more effectively.

Trends in Infrastructure Development: More Reliance on the Private Sector

Recently, Indonesia has embraced a market-oriented approach to development by utilizing public private partnerships (PPP). Public private partnerships bring together business consortiums and private financial sources that work in partnership with government to develop infrastructure projects, often through concessions from a government ministry. As an adjunct to PPP, the GOI is also moving forward with programs to privatize government owned companies, another step in the transformation from government control to private market ownership.[1] Finally, there are ongoing efforts to evaluate the use of municipal bonds as an additional tool to expand infrastructure, and this initiative coincides with government policies that promote more devolution of authority to local government officials.

Although the government has achieved successes with public private partnerships, there have also been a few notable failures. With the public private partnership (PPP) concept poised to become increasingly more important, GOI officials need to focus on the development and implementation of new policies to insure that government can maximize its benefit from PPP development while minimizing its risk.

American Experience with Infrastructure Development: The Early Years

At one time, the United States was a new country rich in natural resources and potential, but still poor and undeveloped. In order to build a strong and successful economy, Americans had to develop businesses that would produce products for basic internal needs as well as goods that could be sold on the international market. In other words, Americans needed to produce goods that had a comparative advantage over European products in order to stimulate and develop successful international trading relationships with Europe. It became evident as the economy grew that the lack of basic transportation infrastructure would put Americans at a cost disadvantage with European producers and inhibit the growth of essential trading relationships. This, in turn, would constrain the growth and development of America's domestic economy.

Like most developing countries, America initially had a competitive advantage in agricultural products and basic raw materials. This was due to the low wages of its labor force, the close proximity of agricultural land and an abundance of raw materials that could be easily extracted. However, these advantages soon faded as the supply of easily and cheaply obtainable raw materials disappeared and the demand for agricultural

[1] The recent $1.0 billion dollar public offering of stock ownership on both the Jakarta and the New York Stock Exchange for P.T. Indosat, the governments long distance telephone company and the successful closing of a $1.9 billion dollar loan for the Paiton power generating facility in East Java are two successful examples of this trend.

products increased. In the future, it would be necessary to transport basic raw materials and agricultural commodities over longer distances to reach their markets.

The increased distance required for transporting products led to a serious problem. Most notably, roads or waterways that would facilitate transportation were unavailable. Transporting goods on horseback or in small wagons was both expensive and time consuming. The inefficient transportation of raw materials increased their cost and placed American raw materials at a price disadvantage over those produced in Europe. In addition, many agricultural products spoiled prior to the time they arrived in the marketplace due to the extended time required for transportation. These factors limited the size of the market for American products.

Canal Development: A Solution to the Transportation Infrastructure Problem

The solution to the transportation problem was the building of a canal that would enable large quantities of goods to be shipped from western New York State and from the midwestern United States (through Lake Erie) to the major markets in New York City and Europe. The development of the canal, known as the Erie Canal, would permit goods to be transported quickly and inexpensively, and the cost advantage over European goods could thus be restored. Since the demand for inexpensive agricultural commodities and raw materials was quite large, the canal attracted a great deal of business and was successful from the beginning.

The canal was constructed by the State of New York essentially as a profit making business. The Erie Canal opened many additional areas of New York State and the midwest for development and contributed significantly to the growth of the American economy. It also facilitated the growth of international trading relationships with Europeans. The Erie Canal clearly demonstrated the advantages of building infrastructure to support economic development.

Expanded Canal Development: Is More Better?

In their book, An Economic View of American History, Jeremy Atack and Peter Passell stated: "The astounding success of the Erie Canal brought forth a wave of imitators. Other states saw the tremendous benefits to New York and overcame previous reluctance to put their own local governments in debt (to build canals)...*Boosterism ran rampant*. Philadelphia, eager to sustain its position as the premier East Coast port, pushed construction of a canal across the Appalachian Mountains to Pittsburgh...By 1860, when canal construction all but ceased, 4,254 miles of canals had been completed..."[2] Government officials had concluded that if the Erie Canal was so successful, then enormous benefits could be achieved by building many more canals throughout the United States. This thinking is known as the "copycat phenomenon", and in many instances, it can be disastrous, as will be evidenced in the next section of this paper where government financial guarantees will be discussed.

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[2] An Economic View of American History, Jeremy Atack and Peter Passell, W. W. Norton & Company, Inc., 1979, Page 150-151.

Canal Financing: Government Financial Guarantees and Financial Disaster

Government officials and private sector consortiums embraced the copycat phenomenon and began to plan many additional canal developments, hoping to repeat the success that resulted from the Erie Canal. The private sector was responsible for financing some of the new canals, about 25% of the total.[3] Many of these private canals were successful, but they made only a small profit for their investors. The limited profitability of this next generation of canals and the increased risk of building new canals resulted in a rapid decline of private sector interest in the canal industry. After this initial period of intensive private sector involvement, private funds were no longer readily available for canal development.

Government officials, keenly interested in promoting economic development within their political jurisdictions, chose to continue building new canals utilizing vast amounts of government funds and sovereign financial guarantees in spite of the limited success of the privately owned canals. City and State officials were obsessed by the potential for economic opportunities and were immune to concerns that the potential risks of failure in building new canals could be disastrous. They were blinded by the assumption that increased economic growth resulting from the canals would provide adequate user fees and new tax revenues to repay the bonded debt of their canal projects.

Canal construction proceeded in three waves, with the first wave including the Erie Canal and most of the privately financed canals. In all, a grand total of $188,000,000[4] was invested in 4254 miles of canal development. Almost 75% of the cost was guaranteed by state and local governments. Instead of taxing local residents, governments leveraged their investment by borrowing approximately $136,000,000 ($127,000,000 of this was borrowed from foreign lenders, mainly from England). Virtually all of the government guaranteed canals built in the second and third waves were financial disasters, and many local governments that had provided "full faith and credit" guarantees had to declare bankruptcy. The default on canal bonds resulted in losses for lenders and investors and created liquidity problems for borrowers of foreign funds for many years thereafter.

Governments officials had embraced the issue of *"social importance"* to justify their involvement in the decisions to improve transportation. Politicians used this issue to justify the granting of *"full faith and credit" government guarantees* to repay canal bonds. "***States became particularly active in those projects rejected by the private sector...In all too many cases, the private sector appraisal proved correct...State guarantees brought financial ruin upon many states in the wake of the 1839-43 depression***. The states of Illinois, Indiana, Ohio and Pennsylvania all defaulted."[5]

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[3] Financing Infrastructure in Developing Countries: Lessons from the Railway Age, Dr. Barry Eichengreen, University of California/Berkeley, The World Bank Research Observer, Vol. 10, No. 1, 1995, p. 83

[4] This is an approximate number. An Economic View of American History, Jeremy Atack and Peter Passell, W. W. Norton & Company, Inc., 1979, Page 153-5.

[5] Ibid, Page 151-155, 171

Lessons from the Canal Era

The effort by the government of New York State to build the Erie Canal was a courageous decision. The financial success of the Erie Canal proved that canal infrastructure could facilitate economic growth and be profitable at the same time. One would assume that the success of the Erie Canal would have been adequate to entice private investment for future canal development, and in fact many of the next generation of canals were successfully built with private assistance and private funding.[6] After the Erie Canal, it would probably have been wise for government to abandon the canal business.

A basic conclusion from the canal period is that prudent and well planned infrastructure can provide enormous benefits to economic growth and development. However, every project must be evaluated on its own merits, and it should not be assumed that a good project concept in one location like the Erie Canal can be duplicated with comparable success in other locations. Furthermore, *government financial guarantees do not assure success of the project*. In fact, sovereign guarantees often facilitate the development of projects that are *not economically viable* and increase the likelihood of failure. Unfortunately, this painful lesson continues to be relearned over and over in the United States and around the world.

Investment decisions by private sector investors proved to be far more accurate than decisions by government officials, although the private sector did make many mistakes. Private funding of canals and private partnerships that allocated more risk to the private sector might have eliminated much of "canal mania" and would have resulted in fewer canals being built. Had government relied more heavily upon the private sector, economic losses sustained by government would have been greatly minimized and states would have averted bankruptcy. The lessons learned during previous canal manias in Europe would also have injected more realism into canal financing and development if they had been applied in America.[7]

There was one indirect benefit from the canal era. The development of canals were paid for in large part with proceeds from the sale of bonds. The need for bond financing facilitated the development of an American bond market and increased the sophistication of the domestic capital markets, mainly through lessons emanating from canal project failures. Financing canals with foreign borrowings helped to educate Americans in international finance and facilitated the establishment of relationships with foreign lenders that benefitted America during the railroad era, when European capital

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[6] "It appears that the major contribution of canals may have been the development of bond markets and the tapping of foreign markets. These financial networks were to prove crucial for financing America's railroads in later years. Foreign loans accounted for a third of the investment in canals". An Economic View of American History, Jeremy Atack and Peter Passell, W. W. Norton & Company, Inc., 1979, Page 153

[7] Canal mania also occurred in England from 1730-90 and in France from 1820-30. In England, over 100 banks became financially insolvent and disappeared as a result of canal mania. A Financial History of Western Europe, Charles Kindleberger, George Allen & Unwin, Ltd. of London, 1984, p. 60, 77, 197-8, 207.

supported the expansion of the American railway industry.[8]

Railroad Development

The development of railroads opened up the American economy to a vast transportation system that was inexpensive, efficient and far superior to canals. Railroads made an enormous contribution to the growth and development of American industry, and the investment made in railroad infrastructure provided major social and economic benefits to the citizens of the United States. Railroads also permitted expansion of industry further into the heartland of America where agricultural and raw material resources could now be economically exploited. Between 1869 and 1879, manufacturing employment increased by 33% while exports increased 250% (in gold values).[9] The building of railroads spawned new industries including steel, coal, industrial machinery, lumber and civil engineering and led to the development of advanced technologies that benefitted American industrial development and competitiveness for many generations.

The United States federal government and the various state and local governments were somewhat more cautious about their role in the investment of railroads as compared to canals. Government permitted the private sector to build and invest in railroads without the overwhelming provision of financial guarantees that proved to be problematic during the canal era. Although there were many railroad feeder lines owned and financed by state and local governments, most railroads were developed by private companies with private capital.[10]

Railroad Construction: Financing and Government Subsidies

The United States Congress placed the expansion of the railroad system as one of the great priorities of the last half of the nineteenth century. The federal government supported private construction of rail lines and developed a program of subsidies to support rail investment. Subsidies were primarily given in the form of land grants, which permitted private railroad companies to obtain land quickly at little or no cost. This permitted railroads to be constructed faster and cheaper.

The land provided to railroads through government land grants became more valuable at various locations as rail lines were constructed, often where railroad stations were located. The sale of the land by railroad companies sometimes provided a significant amount of the cash flow needed to build the next planned extension of the rail line, thus expediting rail construction throughout the country.

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[8] It should be noted here that the defaults of a large numbers of bond issues not only affected the ability of states to borrow funds, but the lack of funds also impacted adversely on the economy as a whole as many business firms were unable to obtain the capital needed to expand their business. Thus, economic growth was slowed for the nation as a whole for some time.

[9] The number of farms also increased by 50% from 1870-80. A Monetary History of the United States, 1867-1960, Milton Friedman & Anna Jacobson Schwartz, Princeton University Press , 1963, p.35

[10] An Economic View of American History, Jeremy Atack and Peter Passell, W. W. Norton & Company, Inc., 1979, Page 428-432

With regard to cash subsidies, the U.S. government decided to evaluate each rail company and its plans on there own merits. Federal government officials did decide to provide financial subsidies and financial guarantees to a few rail lines that were deemed to be in the national interest.[11] These were primarily transcontinental railways that would not be immediately profitable due to the vast distances and lengthy time required for construction. For a few of these lines, there was almost no possibility for profit during the long construction period or during the early years of operation.

For transcontinental lines, the government believed that the long term social and economic benefits would outweigh the initial cost of the subsidies that were to be provided during construction. In theory, this concept of subsidies sounded reasonable, but the implementation was flawed. Subsidies were often not needed because the contractual guarantees that government made to the builders of the new rail system assured an adequate profit. In the end, most financial subsidies to private investors increased their financial return beyond the level needed to promote investment. Subsidies were justified in only a limited number of cases.

Numerous historical analysts have concluded that subsidies and financial guarantees were legitimate for the transcontinental lines. Without subsidies, most of the transcontinental rail lines would not have been constructed until much later, and the economic integration of the United States would have been slowed. Although these subsidies may have been needed, it is more important to understand that subsidies often resulted in higher project costs, and permitted the private sector to earn surplus profits without a commensurate benefit to the public.

The historical analysis is mixed with regard to the smaller regional railroads. Studies have demonstrated that some lines needed the land grants and some didn't. In a few cases, it appears that the land grants were a windfall subsidy for the owners of the rail lines and greatly increased their profit without a corresponding benefit to the government. It should be noted that a number of the small feeder lines were financed through the sale of bonds with financial guarantees issued by state and local governments. In some instances, both the railroads and the local governments went bankrupt as a result of these financial commitments. These bankruptcies created serious long term financial problems for state and local governments.[12]

Conclusions Regarding the Use and Misuse of Subsidy Programs

The conclusion from a review of the railroad era is that government policies should

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[11] Jay Cooke & Co., a prominent investment banking house agreed to underwrite and purchase the bonds of Northern Pacific Railroad without a government guarantee. Cook perhaps failed to realize that the company was borrowing money beyond its capacity to pay in the short tern. He didn't expect a financial panic to occur in the City of London, where American railroad bonds could usually be sold if the domestic market was unable to absorb them. Money of the Mind, James Grant, Farrar Straus Giroux, 1992, p. 51-53

[12] The Handbook of Municipal Bonds and Public Finance, Robert Lamb, James Leigland, Stephen Rappaport, New York Institute of Finance 1993, p. 166-170

discourage the use of subsidies for infrastructure development. If subsidies are needed, non-financial subsidies such as land grants or in-kind contributions are preferable to long term "full faith and credit" financial guarantees. Guarantees will mortgage the future with large financial burdens. If financial guarantees are necessary, government should consider using partial financial guarantees where private equity and some project debt are 'at risk'. Subsidies should be made available on a case by case basis only if there is a convincing need documented by the private sector and a clear and equitable financial benefit to the public. Where subsidies are provided, the private sector should be willing to bear more financial risk as compared to a non-subsidized project.

One additional issue regarding subsidies needs to be highlighted. The arguments used to justify subsidies usually focus on the social needs of citizens with a particular emphasis on helping poor people. Once the decision to provide a subsidy is made, however, the subsidy benefit is often manipulated to maximize benefits to the owner, and the interests of the poor become secondary. This is why it is important to understand that subsidy programs are often abused.

Railroad Regulation: Long Term Implications to the Industry

All utilities are regulated. Many utility sectors such as telecommunications, water, and power are considered basic and strategic national priorities. Regulations must be developed to insure that these utilities provide a service to the public while protecting the national interest. The impact of utility regulations are felt throughout each nation, and the development and implementation of regulations often have far reaching impacts on the national economy.

The study of railroad regulation provides many interesting analyses of the benefits of regulation as well as the problems created when there is no regulation or where regulation is ill-advised. Railroads were natural monopolies (like the water sector) and therefore could charge whatever price they determined was appropriate without regard to the usual competitive market pressures. In the west and midwestern United States, where land grant subsidies reduced the cost of building railroads, there was often no incentive to reduce prices on goods transported by rail in spite of the fact that government subsidies lowered costs. In the eastern United States, the heavy rail traffic allowed railroads to become enormously profitable and powerful.

The lack of railroad regulation ultimately led to serious problems. Regulatory voids and uncompetitive pricing permitted 'parallel' rail lines (also known as 'the blackmail lines') to be constructed adjacent to the most heavily used existing railroad rights of way. The owners of the parallel lines would attempt to steal business away from existing companies by charging tariffs far below those of the older more established lines.[13] The management of the new firms would attempt to blackmail the established rail lines into buying their company, assuming that the cost of buyout could easily be recouped by

[13] This concept is known as 'cherry picking'. It essentially means that the 'blackmail' firms would attack the most lucrative areas of the business and leave the less lucrative areas to the established companies. In many cases, established firms subsidized financial losses on less lucrative lines from excess profits on the heavily trafficked lines.

raising tariffs back to the levels that were in place prior to the establishment of parallel lines. Often, the strategy worked.

As new rail lines were completed, many midwestern railroads were often desperate for customers, and they attracted new business by contracting to ship goods at a lower cost than competing rail systems in spite of the fact that distances were much greater.[14] Since the major costs of railroads were in construction and equipment, the extra cost of hauling freight longer distances was minimal, and a competing line could increase it's revenues for very little additional cost by undercutting competitors. In order to survive, marginal railroads were forced to resort to cutthroat pricing to attract business and increase revenues so they could repay their large debts.[15]

Unfortunately, the era of parallel lines in the east and cutthroat pricing and overcapacity in the midwest brought financial distress to the railroad industry and resulted in bankruptcy for many companies (and local governments). Many other firms narrowly escaped bankruptcy, and the railroad industry as a whole was in financial difficulty. The underlying reasons for the financial problems were easy to understand. The railroad industry suffered from overcapacity, and there was not enough business generated from existing railroad customers to support the costs of repaying the debt on newer less established railroads.

The lack of a regulatory structure for the railroad industry permitted activities like the parallel lines, and they only aggravated the economic hardships prevalent in the industry. A good regulatory environment (self regulation as opposed to government regulation would have been preferable) with rational pricing policies would have eliminated or at least diminished these activities, and the impact of financial failures would have lessened. In fact, the problems of the railroad industry led to a demand that government ensure fairness in rail transport pricing. As a result of these demands, the Interstate Commerce Commission (ICC) was formed. The ICC was to be the government body charged with developing and implementing regulations for the railroad industry.

The Effectiveness of Railroad Regulation

How effective were attempts to regulate railroads? There are still many arguments regarding the impact of regulations aimed at resolving problems in the railroad industry. It is generally agreed that regulations had mixed success in the short tern but were a failure in the long term. Attempts by the railroads to regulate themselves through cartels sooner or later met with failure as economic conditions changed and business cycles fell into decline.

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[14] In some cases, competing rail lines were located next to adjacent railroads. Although the most direct routing of the goods being shipped would normally have excluded the adjacent rail line from consideration, the owners of that rail line, desperate for business revenues to repay their debt, often offered tariffs that were far below those of their competitors and less than their own costs. This was particularly effective for the transportation of goods that were not time sensitive, and the lower cost of transporting directly increased profits of producers.

[15] If the operating costs of hauling additional freight was less than the revenues, then excess revenues were available to pay interest costs and retire debt.

The overwhelming political pressures from special interest groups that needed rail transportation to bring their products to market (like agriculture) forced government officials to take steps to regulate the railroad industry. The objectives of regulation were to bring stability to an ever changing rail tariff structure that alternatively cheated customers by taking unfair advantage of monopoly pricing policies and at times lowered tariff rates so much through cutthroat competition that the economic viability of the railroad industry itself was threatened. Railroads were so important to the American economy that financial instability in the rail sector jeopardized the stability of the American domestic capital market and the international capital markets.[16]

Jeremy Atack and Peter Passell discuss the effectiveness of the Interstate Commerce Commission on regulating the railroad industry. The authors state that "Where it was once assumed that federal regulation defended the "public interest" against the antisocial tendencies of unleashed capitalists, there is increasing uncertainty about what the public interest really is and whether regulators are likely to serve it."[17] Most economists believe that the Interstate Commerce Commission did not serve the interest of the public well over its one hundred year existence. Jeremy Atack and Peter Passell believe that "Rather than serve the public interest or the interests of the regulated, the ICC came to serve the regulator interest."[18]

Atack and Passell provided the following comments about the regulators. "A less understood charge against regulators is that they inevitably become the captives of the businesses they are empowered to regulate. Capture can be overt: An industry employee may simply switch to the public payroll without really changing jobs, or ex-regulators can find (well paying) jobs with the regulated...Dedicated, honest regulators may be overwhelmed by persuasive arguments from well-paid lobbyists representing the regulated. Either way, the end result may be to shield the business from the discipline of the marketplace or, ironically from the discipline of more effective forms of legal regulation, such as anti-trust laws."[19]

Conclusions Regarding Regulation Issues

It seems logical that regulators should focus on enacting regulations that give producers incentives to produce efficiently and to innovate. Market competition is still the most preferred regulator, and it is appropriate for government to insure that competition exists and the principal of fairness is implemented. For BOT projects like water supply, competition should be evident in the development stage, and tariff models should be designed to reward the private sector for efficiency and cost effectiveness that benefits users.

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[16] The House of Morgan, An American Banking Dynasty and the Rise of Modern Finance, Ron Chernow, Touchstone/Simon & Schuster, 1990. p.53-58

[17] An Economic View of American History, Jeremy Atack and Peter Passell, W. W. Norton & Company, Inc., 1979, Page 656 (emphasis added)

[18] Ibid, P. 662

[19] Ibid, P. 657 (emphasis added)

One fact does stand out. It was in the interest of both the government and the banking sectors to have railroad tariffs high enough so that systematic defaults would not occur on railroad bonds purchased by foreigner bankers and investors from Europe. Had defaults occurred, a major source of investment financing for American industry and important trading relationships would have been jeopardized. This is probably one reason why J. Pierpont Morgan, the most powerful banker in the United States, worked tirelessly to bring stability to the industry and its rate structure. It is also the reason that federal government officials needed to keep a close eye of the level of debt being incurred by local governments and their concessionaires.

Did Government Subsidies Contribute to Railroad Overbuilding?

If government subsidies enabled more railroads to be constructed than were needed, then subsidies directly contributed to the overbuilding the railroad industry. Since the overbuilding of railways was the principal cause of the cutthroat pricing policies fostered by unprofitable rail companies, then government subsidies (that permitted more railroads to be built than were needed) accelerated the cutthroat pricing problem and contributed to the need to impose comprehensive regulations on the railroad industry to rationalize tariff pricing. If the government was worried about the instability of the capital markets because of the poor financial condition of the railroad industry as a result of the cutthroat pricing, then it is fair to assume that government may in fact had been one of the primary causes of the capital market instability.[20]

This is an example of government intervention that aims to solve one problem but creates a matrix of new problems that requires continuing government intervention ('distortion of the marketplace' is another term). As has been stated previously, the regulations imposed on the railway industry by the government through the Interstate Commerce Commission had many adverse impacts on the railway industry.

Infrastructure Development: Impact on Domestic Capital Markets

One of the most important indirect benefits emanating from the development of the canal and railroad industries was the development of the American capital markets. The capital markets became increasingly sophisticated during the canal era. In the railway era, the capital markets were able to facilitate the mobilization of capital to support the huge financing needs of new railroad construction. The capital markets also assisted in the financing of industries like steel and coal that were being expanded to support increased rail construction. In later periods, the capital markets supported the development of the automobile, energy, and manufacturing sectors and played a pivotal

[20] New tax legislation enacted by the United States Congress under the Reagan administration granted subsidies that contributed to a large overbuilding spree for commercial real estate and significantly increased the problems of the U.S. savings and loans banks. Tax subsidies were so lucrative that hotels and office buildings were built years ahead of their need because subsidies could support negative cash flows for many years. The bailout of the savings and loans cost the U.S. government nearly $500 billion dollars. Fortunately, the American government repealed the laws that permitted accelerated subsidies for real estate.

role in the growth and development of the American economy as a whole.

Today the American capital markets are the most advanced in the world. American firms have a multiplicity of financial mechanisms that can be employed to finance almost any kind of business endeavor. The availability of capital and the legal and financial infrastructure that support capital mobilization provide a firm foundation for the future success of the American economy. However, the sophistication of the American capital markets was not developed quickly. Alternating periods of prosperity and decline permitted market participants to gain experiences from success and failure and to use those experiences to develop the institutions and financial intermediaries that continually fine tune the efficiency of capital market mechanisms.

Drainage-Ditch Finance

The power of the early twentieth century capital markets to mobilize capital for infrastructure development was undoubtedly demonstrated by a regional investment banking house, Caldwell and Co. Unfortunately, Caldwell also provided a vivid demonstration of the power of markets to fail. James Grant termed Caldwell & Co. "a domestic case study in the proposition that lenders and borrowers periodically suspend their judgement."[21]

Caldwell & Co. was able to raise huge sums of money for infrastructure projects, even if they failed to pass the common sense test. In 1909, the state of Tennessee passed a law that permitted the creation of drainage districts. The districts were permitted to dig drainage ditches and sell bonds to pay for the cost of the construction. Drainage districts were permitted to tax local property owners to obtain the revenues needed to repay the owners of the bonds. Caldwell saw drainage ditch bonds as a profitable business opportunity and unwisely encouraged the use of bonds to finance drainage ditch projects of dubious need. Unfortunately, none of these projects were financially feasible and all forty bond issues underwritten by Caldwell defaulted after property owners refused to continue to repay the high taxes levied by the drainage districts. Mr. Caldwell, however, made a handsome profit on the sale of the bonds.

Mr. Caldwell then turned his attention to mortgage real estate bonds, as they looked to be a much larger market than drainage ditch bonds. Real estate mortgage bonds were sold to fund construction of new commercial real estate or to purchase existing commercial buildings and/or vacant land. The collateral for the bonds was secured only by the buildings and land that were purchased with the proceeds from the bonds. At that time, real estate mortgage bonds were very popular, and like drainage ditch bonds, they carried a very high interest rate. Needless to say, most of the projects were not financially feasible and the mortgage real estate bonds were a failure. Ninety-five percent (95%) of the bonds that were sold (approximately $19,000,000) ultimately defaulted.

Mr. Caldwell began to have difficulty selling bonds underwritten by his company. In order to generate new business, he developed outrageous schemes to sell even more

[21] Money of the Mind, James Grant, Farrar Straus Giroux, 1992, p. 178

bonds as he persevered unmolested on his path to financial destruction. When he was finally unable to sell new bond issues to the public, he purchased an insurance company and used its financial assets to buy bonds underwritten by his investment banking company, without regard to credit quality. In addition, he required companies that issued bonds underwritten by Caldwell & Co. to maintain accounts in his bank, the Bank of Tennessee, and he improperly used those deposit funds to purchase the bonds issued by the same company. By 1929, "some $19,500,000, amounting to 55% (of the banks) total assets was plainly and dangerously illiquid."[22] In other words, the bank was bankrupt, the life insurance policies were worthless and the widows and elderly investors in Caldwell bonds were left with worthless paper.

The Perils and Pitfalls of Capital Markets

Caldwell & Co. serves as an instructive example that the financial systems and the capital markets that are created to serve the legitimate needs of the marketplace can also be a tool of destruction if they are abused by misguided or corrupt businessmen. There is no doubt that Caldwell exploited opportunities to make money selling bonds by shrewdly manipulating honest public officials and by satisfying the unseemly desires of corrupt officials. Caldwell was not the first and certainly not the last managing director of a financial institution to abuse his fiduciary responsibilities in order to enrich himself.

Clearly, Caldwell & Co. was able to manipulate and swindle because the regulatory environment for financial institutions was ineffective and dysfunctional. In that era, the disclosure requirements of banks were weak, and it was easy for financial institutions to misrepresent their true financial condition. Often, the general public was unaware of bank problems as they operated upon a system of blind trust. The regulators of that era lacked power, and the government-owned bank deposit insurance companies did not yet exist. The private credit rating agencies that now evaluate companies as well as individual projects were weak and not as fully established in the marketplace as they are today.

How Can Problems like these be Avoided?

In order to avoid problems similar to Caldwell & Co., the Government of Indonesia will need to be vigilant and conservative in its oversight of public private partnerships, BOO/BOT projects and local government agencies that issue municipal bonds. Government officials should expect the type of problems that occurred as a result of actions by Caldwell & Co. to reoccur periodically. Hopefully, the regulatory structure that Indonesia is building will minimize financial meltdowns like Caldwell & Co., and credit rating agencies like PEFINDO will acquire the capabilities necessary to focus on fundamental project evaluations in order to provide a thorough, impartial and transparent analysis of proposed PPP projects. Furthermore, the GOI should strive to obtain a balance of risk-sharing between the public sector, the private corporations and the financial institutions that provide the bulk of the funds that will support infrastructure project developments.

[22] Money of the Mind, James Grant, Farrar Straus Giroux, 1992, p. 181-182

Conclusions: The Lessons of History Loom Large in the Modern World

The theme of each section of this paper is that private sector participation in partnership with government coupled with strong capital markets is a powerful tool of economic growth and transformation. No credible observer of economic history can dispute this fact. The challenge for government is to harness the power of the private sector as an engine of sustained growth and economic stability. With the symmetry of the marketplace in constant transformation, this will not be an easy task.

What are the Lessons?

The principal lesson from the study of historical infrastructure development in the U.S. is that private sector involvement and capital are essential to facilitate national economic growth. Private sector participation has resulted in an enormous expansion to the infrastructure base of the U.S. and other developed countries, thus permitting commerce to flourish and economic conditions to improve dramatically. No rational modern government plan to enlarge its infrastructure base should exclude significant private participation and ownership of infrastructure.

One of the major objectives of government should be to understand how private sector participation should be coordinated in order to best ensure that private resources and capital are channeled into productive uses. Railroads and canals were more successful developed in the U.S. when private owners and private capital providers were required to make project decisions that placed their financial resources 'at risk'. This doesn't mean that the private sector can't make mistakes, as they often do. However, private sector mistakes are often corrected faster because of profit considerations. The case of canals and railroads demonstrate that the cost of government failures usually outweighed the benefits of direct government financial support.

Financial Guarantees and Subsidies: Do They Really Work?

As we have seen from examples in the railroad and canal sectors, government subsidies and "full faith and credit"[23] loan guarantees often eliminate the risk for private owners and financial institutions. In these instances, the private sector will participate regardless of the merits of the project, because their profit is assured. Furthermore, government financial guarantees do not assure success of the project. In fact, sovereign or full faith and credit guarantees often facilitate the development of projects that are not economically viable, as the canal era so vividly demonstrated.

Historical studies have shown that local governments granted "full faith and credit" financial commitments for project developments because they believed that improvements provided by new infrastructure would result in enormous benefits to their communities. Sometimes this is true, as the Erie Canal and US transcontinental railroads

[23] Full faith and credit" is another expression of sovereign guarantees. The term "full faith and credit" is often used to describe government guarantees at the state and local government levels, and sovereign guarantees are used for national government guarantees.

have demonstrated. But far more often, government officials were involved in a hasty decision-making process where the benefits of project developments were overestimated and the risks were underestimated.

This was the case during the canal eras in England, France and the United States where government officials were so convinced of the potential for economic opportunities, that they ignored the significant risks and consequences of failure. It was also true in Argentina, where water bonds from the Buenos Ayres Drainage and Waterworks Company[24] defaulted in 1890, bankrupting the English investment bank Baring Brothers, Ltd.[25] The railroad era also has many examples where "full faith and credit" financial commitments from city and state governments sponsored failed projects that resulted in overwhelming financial burdens being assumed by government. Drainage ditch development is the probably the most instructive and extreme example of this phenomenon.

The railroad era also provides a good example of the potential dangers of subsidies. Land grant subsidies were given to facilitate the building of railroads. However, the implementation of subsidy programs was flawed, and railroad builders often achieved windfall profits from the subsidies. Furthermore, subsidies encouraged the construction of more rail lines than were needed, and this led to the cutthroat pricing problems that almost bankrupted the railroad industry. The financial problems of the railroad industry created an environment where railroads needed to be regulated by the government, and for over 100 years, the actions of the railroad regulations adversely impacted the railroad industry in the U.S. Remarkably, the impact of subsidies were still being felt 100 years later.

Indonesian government policy makers should be cognizant of the power of financial guarantees and subsidies and the significant risks that accompany their use. Both developed and developing countries have numerous examples of subsidy and loan guarantee programs that have failed to produce their intended results and ultimately led to higher social and economic costs that far exceeded the benefits of the subsidies. Our study of historical infrastructure demonstrates how easily subsidies and loan guarantees can be abused by businessmen and government officials to the detriment of needy citizens. Policy makers must not lose sight of the fact that subsidy programs are repeatedly misused, and the needy recipients of subsidy programs frequently don't receive the benefits.

Regulation: The Impacts must be Carefully Studied. Flexibility is Critical.

Once regulations are enacted they usually stay in place for long periods of time. In America, the Interstate Commerce Commission has regulated railroads for over 100 years. The railroad industry was deregulated in the 1980's in America and subsequently

[24] Manias, Panics and Crashes--A History of Financial Crises, Charles P. Kindleberger, Basic Books, Inc., 1989, p.122

[25] Latin America's Economy, Diversity, Trends and Conflicts, Eliana Cardoso and Ann Helsege, Massachusetts Institute of Technology Press, 1992, p.113

restructured itself to accommodate new realities of the transportation marketplace. The results of the restructuring have demonstrated that rail cargo can now be delivered faster and cheaper, and rail companies are more profitable now than they were during the era of heavy regulation.

The problem with regulations is that the market conditions that fostered the need for regulations usually shift quickly while regulations that impact on the marketplace do not. Once the laws are enacted and regulations developed, legal and regulatory changes are difficult to achieve without a strong political consensus and significant public support. The regulations in the railroad industry provide ample evidence of the problems that over-regulation can create by focusing on microeconomic industry controls at the expense of fair market competition and the operational and economic efficiencies that can be achieved from competition.

Copycat Phenomenons

When the advantages of development become apparent, the urge to copy development models that others have used successfully can be overwhelming. Government policy makers should assume that local government officials and private sector consortiums in search of ideas to foster development will embrace the "copycat" phenomenon, hoping to repeat the successes that have resulted elsewhere.

It is almost impossible to stop the copycat phenomenon, since it is difficult to perceive if copycat projects will or will not work. Government policy makers should attempt to guard against the problems that resulted from copycat projects in the canal and rail eras by insuring that a good capital market regulatory framework exists, so that all potential infrastructure projects will be evaluated on their own merits. Projects must not be evaluated on the rationale that if a project worked in one location, then it will probably work with comparable success in other locations too. Developing financial policies that require all participants in public-private partnerships to be financially 'at risk' and educating local government officials in risk management should also contribute to minimizing problems that result from the copycat phenomenon.

The Role of the Capital Markets is Critical

Without the domestic and international capital markets, the canal and railroad eras would not have been possible, and the growth and development of the United States would have been prolonged considerably. Indonesian policy makers must accept the proposition that the availability of capital from the capital markets and the legal and financial infrastructure being developed to support capital mobilization will provide a firm foundation for the future success of Indonesia just as it did for America.

Indonesia, like America, will have alternating periods of prosperity and decline that will impact on the development of the institutions and financial intermediaries that enhance the sophistication and efficiency of its capital market mechanisms. Hopefully, comparisons to Caldwell & Co. will also provide Indonesia with instructive examples

that will benefit policy makers who are guiding the development of the capital markets.

Dr. Barry Eichengreen, writing for the World Bank Research Observer stated that "Policy makers need to encourage the development of financial institutions and instruments such as banks, mutual funds, and bond-rating agencies that can surmount information problems and relieve government of the need to provide subsidies and interest guarantees".[26] Indonesia has made great strides in the development of its capital market mechanisms. Continued progress will facilitate the achievement of national development goals and economic progress.

Final Conclusion: Lessons of History Applied to Environmental Infrastructure

Environmental infrastructure is critically important to Indonesia. A failure to address the demands for environmental management will seriously compromise economic growth and development as well as the environmental health of the nation. Indonesia must not fail to deliver the basic infrastructure that will protect and preserve her environmental heritage and further her economic interests.

The lessons of history impact directly on the environmental infrastructure sector. Subsidies, loan guarantees, regulations and capital markets all figure as prominently in the policy discussions regarding environmental infrastructure as they did for canals, railroads, drainage ditches and most other types of infrastructure. In order to achieve genuine successes and to minimize the impacts of failures, it will be critical to apply the forthright lessons of economic history and the conclusions drawn from their case studies to the development of policies and procedures that guide public and private sector officials into the environmental infrastructure era in Indonesia.

Historical lessons have clearly illustrated that government intervention through the use of subsidies, loan guarantees, and heavy regulation should be avoided to the maximum extent possible. Financial incentives like subsidies and loan guarantees have most often resulted in imposing large cost burdens without providing corresponding benefits, and Indonesian policy-makers should assume that the problems with these financial interventions will be as problematic here as they have been elsewhere.

As a series of next steps, the Private Participation in Urban Services Project will, as part of the second PURSE workplan, prepare a brief report on financial guarantees for environmental infrastructure projects. PURSE also intends to prepare a report on private financing mechanisms for environmental infrastructure using corporate bonds, and will undertake a major study on project and financial risk resulting in the development of a risk management and evaluation system for infrastructure projects. The risk management system will be developed in cooperation with Chemical Bank and Standard & Poor's Inc.

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[26] Financing Infrastructure in Developing Countries: Lessons from the Railway Age, Dr. Barry Eichengreen, University of California/Berkeley, The World Bank Research Observer, Vol. 10, No. 1, 1995, p. 88