

The Threat of U.S Competitiveness in Today's Global Economy

Aysar Philip Sussan

Bethune – Cookman University, U.S.A

sussana@cookman.edu

Alexander Heil

University of Phoenix, U.S.A

aheil@email.phoenix.edu

ABSTRACT

The United States' overall competitive position in the world economy is threatened by deteriorating infrastructure and the lack of sufficient Federal, State and local funding designated to maintain the backbone of the economy. Across all infrastructure categories but most strikingly transportation, water and wastewater, a large gap has opened up between the needs of the systems and the available funding sources. In other sectors such as healthcare, high expenditure levels appear to not yield any corresponding high returns. Whereas the precise consequences of inaction are uncertain, it appears likely that similar to firms and businesses that lack productive capital to remain profitable, the US economy will be confronted with an economic challenge. Swift action on behalf of policy makers in Washington and the local level is required to reverse this trend and maintain the economy's superior competitive position in the 21st century.

Keywords: Deteriorating infrastructure, Competitive Position, GDP, Living Standards, Urbanization.

INTRODUCTION

Even while facing a significant domestic and global recession in 2008 caused by a collapse of real estate and financial markets, the U.S. economy nevertheless has seen tremendous economic growth over the last three decades. In fact, GDP has grown from \$2.7 trillion in 1980 to \$14.2 trillion in 2008 measured in nominal terms (Bureau of Economic Analysis, 2008).

Throughout this period, the United States has functioned as an economic engine and catalyst for the world, consistently accounting for more than one-fifth of output generated by the global economy and outpacing other industrialized nations. But other countries have been catching up especially the European Union and nations in Southeast Asia. Even as the mature U.S. economy is expected to grow robustly (potentially doubling in size over the next 25 years if the long-term GDP growth trend is retained), other countries are now seeing their economies expand more quickly and offering formidable competition to the United States. Almost daily newspaper reports document the rise of India and China as well as their massive demand for raw materials and tremendous manufacturing capacities.

The competitiveness of the US economy is still outstanding because of its capacity for innovation, higher education system, market size in terms of labor and product markets, flexible capital markets (at least prior to the financial market turmoil in late 2008), and transportation network. These advantages have allowed U.S. industries to take a leadership role in the global economy, providing products and services demanded worldwide.

However, the gains that businesses and the country as a whole have made are at risk. For example, since 9/11/2001 terrorist attacks the current inclination of the United States is toward greater control of the laws to limit access to information and taking legal actions to seize Internet related hardware and technology (Sussan and Recascino, 2007). According to many national

experts and as witnessed by Americans across the country such as during the recent Interstate I-35 bridge collapse in Minnesota, the core structure of the economy is deteriorating. In particular, infrastructure assets have been deteriorating at an increasing rate. The American Society of Civil Engineers (2005) states that up to \$1.6 trillion in investments may be required over a five-year period in order to fix roads, dams, schools, bridges and other assets. With the deteriorating infrastructure also comes a potentially lower standard of living for the average American. Income inequality has widened and large per-capita expenditures on healthcare have left the country with more than 45.7 million individuals uninsured (Current Population Reports 2008) and performance metrics that lack in international comparisons (OECD 2008).

The commitment of politicians appears to be lacking or even nonexistent. Complacency has set in and avoidance of a serious redirection is likely to have dire consequences. As a result, the competitive base of the United States is being threatened and may suffer in a global economy that is driven by outsourcing, low cost production, and a general catching up of countries in the developing world.

ECONOMIC TRENDS AND DEVELOPMENT

Over the last several decades, overall economic growth and a tremendous creation of wealth has lifted many American families into the middle class and provided them with economic and financial well-being that is much greater than what previous generations had seen. Whereas median household income was equal to \$36,847 in 1967, by 2006 it had grown to \$48,201 as measured in 2006 dollars. Poverty rates across all ethnic and income groups have declined over the last 50 years (Current Population Reports, 2006). This half-century of economic growth has

also seen the expansion of employment opportunities in large and suburban metropolitan areas driven in part by significant federal investment in highway infrastructure, suburbanization and the increase of labor force participation among women which created additional income and resulting independence. But it appears that the country is at a crossroads. Substantial growth in population is forecast for the coming decades as documented by the Transportation Research Board (2007). Over the next 30 years, the U.S. population is projected to grow by 80 million people, from 300 million today to 380 million in 2035. The economy is projected to grow about 2.8% per year in real terms over this period.

Overall the U.S. economy is experiencing a transformation across different areas. The world economy is becoming more and integrated. Domestic markets are expanding beyond a purely local reach, emphasizing economic regions and the interconnections with labor and product markets overseas. The economy has become much more services-oriented. Whereas manufacturing is still a sizeable share of total economic output, information and services industries have become more dominant in recent years. By 2006, services accounted for more than one-half of the U.S. economy, up from 25% in 1950. Over the same period, agriculture and manufacturing's share of U.S. production fell dramatically (BEA, 2008). Throughout the United States, economic concentration along the Coasts has lessened while increasing economic importance is occupied by the South and Southwest. Connectivity of these regions to the population centers in the Northeast and Midwest as well as overseas will become more critical. Lastly, the U.S. population and workforce are aging and an increasing number of products and services are geared towards servicing the changing demographics.

Research points to the fact that the United States also has become an increasingly urban nation (National Chamber Foundation, 2007). By 2030, 90% of the U.S. population will be living in

metropolitan areas. The concentration of population, jobs and income is similarly striking. The 100 largest metropolitan regions in the United States account for just 12% of the land area but contain 65% of the population, 69% of all jobs, and 70% of the nation's GDP (Global Insight, 2007). The largest 100 metropolitan areas also provide the focus for all transportation activity in this country. Specifically, 72% of all foreign seaport tonnage, 79% of all U.S. air cargo tonnage, 92% of all air passenger boarding, and 95% of all public transit passenger miles traveled is located in these urban areas (The Brookings Institution, 2007). As a result, the demand on infrastructure, not only transportation but also other critical assets, has grown.

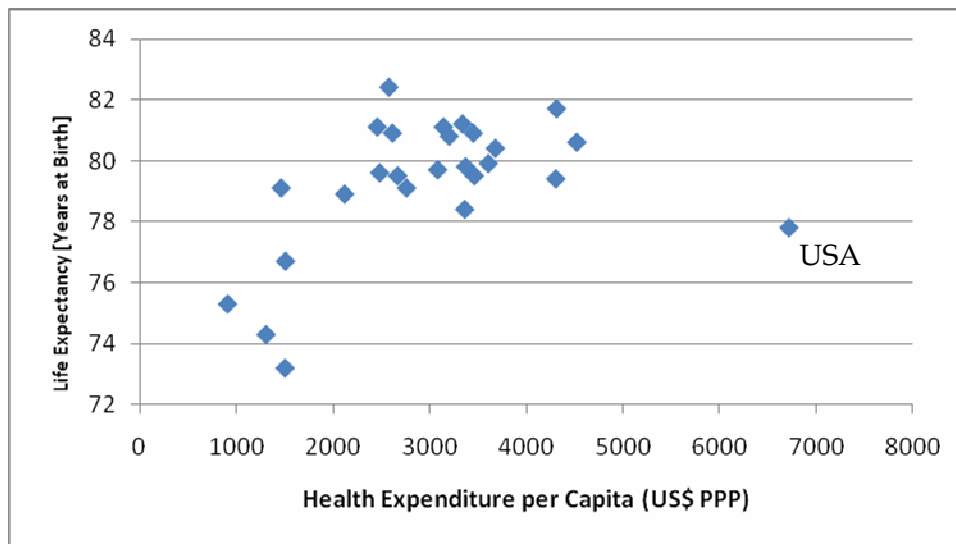
Not all these trends have been positive however. Whereas the total aggregate income in the United States has increased tremendously, these gains are not experienced equally across the income distribution. In effect, the gap between the rich and poor has opened up over the same period, and the United States in 2006 has returned to the same levels of inequality found at the beginning of the 20th century (Saez and Piketty, 2003). The income earned by the top 1% of the United States wage earners exceeded 14% of total income in 2006 compared to below 8% in the early 1970s and approximately 18% at the end of World War I. According to Krugman (2007), poverty rates across all ethnic groups have increased since the year 2000 and are still above what they were at the turn of the last century. Whereas in the year 2000, 11.3% of people lived in poverty, in 2006 the percentage was 12.3, and approximately 46 million Americans had no or only part-year access to health insurance (Current Population Reports, 2008).

No longer can most middle class households afford to live on one salary alone, which in part explains the increasing labor force participation rate among women in this country as well as increasing weekly hours worked, but now additional uncertainties have arisen in the form of declining wage bargaining power due to the reduced unionization, increased globalization and

relocation of jobs to low-cost countries such as India and China, and education and energy cost that vastly outpace wage growth and further squeeze family budgets (Bernstein, 2007). These problems are imminent and require a comprehensive political and policy solution. In the authors' opinion, the free market will not be able to correct for the distributional, access and inflationary price spirals but rather it will require a concentrated effort on the part of all major stakeholders to reverse this trend.

In some of the areas in which the US has been able to enjoy a preeminent position in terms of expertise and technology, some of the trends when looking at international comparisons are disturbing. An example for such a situation is healthcare. According to the Organization for Economic Cooperation and Development (OECD), the US spends by far the most on a per capita basis on healthcare but other countries have been able to perform better when providing these services to their citizens (see Figure 1). For example, whereas per capita expenditures accounted for more than \$6,700 in 2006 compared to \$3,400 in France and Germany and \$2,700 in Japan, life expectancy at birth in the US was by no means exceeding the same measures in other countries.

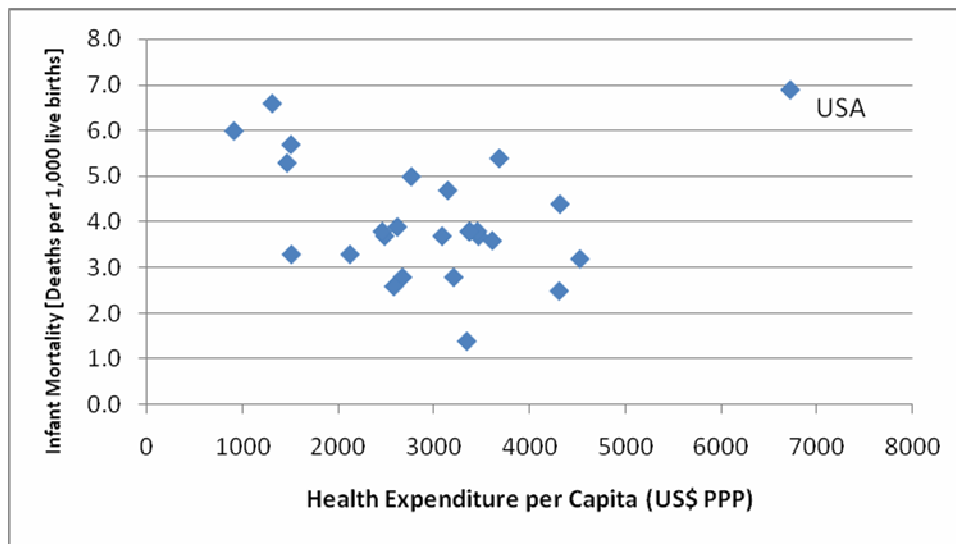
Figure 1: International Life Expectancy vs. Per Capital Health Expenditures



Source: OECD (2008)

As can be seen in Figure 2, the same conclusion can be drawn when infant mortality rates are considered. Again, the United States' healthcare system places well behind other international benchmarks unveiling a rather disturbing trend. The last century has generated massive improvements in the standard of living for the average citizen and it is arguably the case that many of these positive effects were caused by the wealth of capital infrastructure, broad support for infrastructure investments, and emphasis on technology, research, and education.

Figure 2: Infant Mortality vs. Per Capital Expenditure Comparison



Source: OECD (2008)

Today assessment of the components that allowed the United States to provide well for its “average” citizen over the last half-century yields troubling conclusions. Microeconomic theory considers the mix of economic resources such as land, labor, capital and entrepreneurial ability when assessing the profitability of firms. The inventiveness and ingenuity of the American entrepreneur is not debated here but rather the lack of infrastructure improvements, or the capital of the American economic engine. Similar to individual firms who experience marginally declining return to labor when capital is fixed in the short term; the overall macroeconomy also depends on the optimum mix of infrastructure and labor when trying to achieve prosperity for its citizens. The thesis of this paper is that with deteriorating infrastructure assets, defined as water, wastewater and especially transportation¹, future growth and competitiveness of the US economy is threatened. In other words, Americans will have to become accustomed to lower living

¹ Other infrastructure sectors and industries such as aforementioned healthcare could certainly also be investigated but for the purposes of this study, the authors limited themselves to the well researched sectors of water and wastewater in addition to transportation.

standards as the result of crumbling bridges and roads, leaking sewer and water pipes, and a general lack of maintenance of the country's infrastructure backbone.

TRANSPORTATION INFRASTRUCTURE ASSESSMENT

In a recent study (NCF, 2007) the linkages between transportation investment and economic growth have been identified and documented. Transportation system investments result in user benefits for all travelers on the network. Lower travel time and operating costs reduce the costs of doing business and make firms more productive. Increased productivity results in improved competitiveness for the economy as a whole and in addition supports economic growth. The transportation investments in the first half of the 20th century are a clear example of such improvements in economic productivity and competitiveness.

Numerous studies document the link between infrastructure improvements and economic growth. According to the Eddington Transport Study (2006) in the UK, a 10% increase in public infrastructure capital stock increase GDP by around 2% on average. The research also stressed the importance of transportation networks and corridors to the productivity and success of metropolitan areas, in particular in providing access to larger labor and product markets. Finally, it highlighted that transportation improvements are critical to trade flows and the competitiveness of a country's exports and imports.

Nadiri and Mamuneas (1998) showed in a seminal study that each dollar invested in the nation's highways generated about 30 cents of production cost savings to businesses per year over the life of the asset. His research suggested that highway investments have contributed an average of

25% of total national productivity growth nationwide during the construction of the interstate highway system. Prud'homme and Lee (1998) estimated that improvements to the transportation network that improve travel times for all users by 10% result in productivity gains of 2.9%. A study for the National Cooperative Highway Research Program (Cambridge Systematic, 2002) summarized the overall benefits by stating among several other benefits that infrastructure expenditures boost industry and economic productivity and strengthen regional and economies.

The benefits of transportation investment have been documented by research. But the question of how much the country should invest in its critical infrastructure is far less clear. The estimates of the required investment needs on transportation vary depending on the selected source and study. A National Chamber Foundation Study (2005) projected that an investment of an additional \$50 billion a year in our highway and public transportation systems is required to just maintain their current performance, and more than \$100 billion annually to improve the performance of the highway and transit systems. Ports will require significant upgrades and investments as well even though precise estimates do not exist. Overall, due to the expected doubling of cargo volumes by 2020, with some ports facing a tripling or quadrupling of container volumes moving across their piers, billions of dollars will likely have to be incurred. ASCE estimated it would require \$125 billion to replace the locks on our aging inland waterway system.

A similar situation exists for the rail and air transportation sectors. The Association of American Railroads (AAR) estimates that an investment of \$148 billion is needed to keep pace with economic growth and the expected level of freight volume by 2035 (Cambridge Systematics, 2007). In addition to the added airport capacity projected by the US DOT, the Federal Aviation Administration (FAA) estimates that \$41 billion of Airport infrastructure developments will be

needed in the next five years. The Airport Council International/North America projects that during this same period, more than \$87 billion will be needed for aviation improvements not considering the \$15 billion to \$22 billion needed over the next 15 years for the NexGen air traffic control system (United Parcel Service, 2007).

Underinvestment in these assets and their resulting underperformance costs the economy money. The Texas Transportation Institute (TTI) reported in its 2007 Mobility Study that congestion caused annual congestion costs as measured by time delays and wasted gasoline of \$78 billion nationwide (Schrank and Lomax, 2007). The Federal Highway Administration (FHWA) calculated that delays caused by highway bottlenecks cost more than \$8 billion a year for the freight sector which has direct implications for industries' competitiveness. Higher oil prices will make these costs even larger than their current estimates.

WASTEWATER INFRASTRUCTURE ASSESSMENT

Not only is the distribution of commuters, vacation and business travelers and freight essential for the functioning of the US economy but also the distribution of another key resource: water. Consisting of approximately 54,000 community water systems (Water Infrastructure Network, 2000), the water industry in the United States provides a service that Americans have accustomed to in terms of quality and availability. Most public water systems supply the residents in their respective areas with quality drinking water regardless of the time of day or night. But the availability of safe drinking water is increasingly being questioned in light of deteriorating infrastructure. Most of the water pipes in the US, except for new extensions of existing systems and recently added assets in quickly growing cities in the South and Southwest, were installed in the late 19th. At this point the average life of a water pipe in an urban area is

roughly 100 years whereas the design life may, depending on the specific characteristics, be closer to 80 or even 70 years. In the year 2000 alone, the nation experienced approximately 200,000 water main breaks combined (Olsen, 2003).

A similar dilemma exists for wastewater systems in the US. The ASCE (2005) graded wastewater infrastructure with a D- in its most recent score card. Urban and suburban population growth combined with more stringent environmental regulations do not only create the need to build additional facilities but also require local communities, states, and the Federal government to invest significant funds in order to retain the level of service for the existing systems.

Deteriorating wastewater infrastructure provides a public health concern. Research has estimated that 1.2 million gallons of water overflow every year from sewer system that cannot deal with the demand during periods of heavy rainfall. In addition, collapsing storm sewers also provide communities with additional requirements to safeguard the public – but at a rising cost burden. These safety concerns will only become more pressing as the population in the United States approaches the 400 million mark by mid-century.

Expert opinions differ on the extent of investment that is required to retain the current service level of water and sewer systems in this country. Keeping in mind that with an aging asset, the annual expenditures on maintenance keep growing proportionally to the value of the asset, the financial needs are expected to grow exponentially if no large scale effort is undertaken to fix the problem.

The Environmental Protection Agency (2002) has estimated the total capital and maintenance investment requirements for clean and drinking water systems over a 20-year period of between \$76 billion and \$634 billion [in 2000 dollars]. The range varies as a result of revenue growth

assumptions, or the extent to which utilities will be able to raise rates and fees on an annual basis. This is equivalent to annual expenditures of between \$3.8 and \$31.7 billion. The Congressional Budget Office (2002) estimated that annual capital investment needs range between \$24.6 and \$41 billion annually for water and wastewater. The Water Infrastructure Network estimated that over a 20-year time horizon \$23 billion would have to be invested annually in order to comply with federal drinking water regulations. That is an investment level over and above the current funding amounts. Federal contributions are vastly insufficient and have declined approximately 75% since 1980. Today, they only represent 10% of capital expenditures and 5% of total expenditures in water and wastewater systems (WIN, 2000). States carry the major investment burden but considering their balanced budget requirements, sufficient investments are unlikely to be made.

What Does This Mean for the Competitiveness of the US Economy?

The trends for transportation, water and wastewater certainly do not exist in isolation. Other sectors also have large funding gaps and require significant investments just to keep up with the current demand levels. For example, the ASCE score card points out that education as a sector is up to \$268 billion under funded, only measuring the physical infrastructure in American schools alone. More than \$10 billion is needed to fix the 3,500 unsafe dams in the United States. Nearly 50% of the locks on the nation's waterways are functionally obsolete and would require a total investment of \$125 billion. A reform of the healthcare system, as demanded by politicians and many activists, would require additional investments totally billions of dollars. The list of funding needs is endless and there appears to be a lack of political will and financial viability to address all these issues.

In effect, the Federal government has invested less not more in its critical assets in recent decades. Federal Gross investment in structures has declined substantially over the last 50 years (BEA 2008). Funding needs have been shifted towards the state and local levels and it is increasingly the case that maintenance and improvement projects are put on hold because of deteriorating budgets and growing financial shortfalls, especially over the course of the current fiscal year. Overall, the closer an asset is to the end of its design life, the more emergency [vs. preventative] maintenance is generally required. In an environment where overall investment levels are falling, the funding gaps as documented in this paper will only become more significant in future years.

CONCLUSION

The labor force in the United States, already squeezed by stagnating real wages, increased competition for jobs from overseas and in recent months rising food and energy prices will also be faced with lower productivity. Compensation for labor is to a certain extent directly related to the resource's productivity and therefore, depending on the pace of asset deterioration and intermediate funding additions, residents of the United States will likely be confronted with a reduction in their overall productivity and compensation over the next decades. This will be true in addition to the factors that have caused a reversal of income inequality gains since the 1960s and a concentration of income and wealth among the top income earners in this country. Lastly, it also does not appear that some of the expenditures by private and government entities are made in the most efficient way. In regard to healthcare, the US population enjoys lower quality of care as measured by standard performance metrics while devoting the largest per capita share of expenditures to this industry. By withholding the necessary productive capital from the majority

of labor in the US, the tools is not available that would allow this majority group to make up any lost ground.

The facts speak for themselves. In order to retain and rebuild the US economy's preeminent global position, immediate action needs to be taken. As long as politicians decide that defense spending and military interventions are worth the nation's financial resources, the day may also come when global competitiveness is seen as an objective that requires the additional allocation of valuable and scarce resources.

REFERENCES

American Society for Civil Engineers, (2005) *Report Card for American Infrastructure 2005*.

Available at <http://www.asce.org/reportcard/2005/page.cfm?id=103>

Bernstein, Jared (2007) *Crunch: Why do I feel so squeezed?* Berrett-Koehler.

Bureau of Economic Analysis, *National Income and Product Accounts*, Data extracted on June 6, 2008 from <http://www.bea.gov>.

Cambridge Systematics, Inc. (2002), *The Benefits of Transportation Investment: Economic, Environmental, Community and Social, Congestion Reduction*. Prepared for the National Cooperative Highway Research Program (NCHRP) Transportation Research Board, Washington, D.C.

Cambridge Systematics, Inc. (2007), *National Rail Freight Infrastructure Capacity and Investment Study*. Prepared for the Association of American Railroads.

Congressional Budget Office (2002), *Future Investment in Drinking Water and Wastewater Infrastructure*, Washington, D.C.

- Current Population Reports (2006), *Income, Poverty and Health Insurance Coverage in the United States 2006*, United States Census Department, Washington D.C.
- Current Population Reports (2008), *Income, Poverty and Health Insurance Coverage in the United States 2007*, United States Census Department, Washington D.C.
- Global Insight (2007) *U.S. Metro Economies, Gross Metropolitan Product with Housing Update*. Prepared for the United States Conference of Mayors and The Council for the New American City in January 2007.
- Krugman, Paul (2007) *The Conscience of a Liberal*, W.W. Norton.
- Nadiri, Ishaq and Theofanis Mamuneas (1998), *Contribution of Highway Capital to Industry and National Productivity Growth*. U.S. Department of Transportation, Federal Highway Administration Office of Policy Development. Washington, D.C.
- National Chamber Foundation (2005), *Future Highway and Public Transportation Finance Study*. U.S. Chamber of Commerce, National Chamber Foundation, Washington, D.C.
- National Chamber Foundation (2007) “The Transportation Challenge”, Washington D.C.
- OECD (Organization for Economic Cooperation and Development) (2008) OECD Health Data Frequently Requested Data, from www.oecd.org.
- Olson, Eric (2003), “What’s on Tap? – Grading Drinking Water in US Cities”, Natural Resources Defense Council, Washington, D.C.
- Prud’homme, R. and Lee, C-W. (1999), Size, Sprawl, Speed, and the Efficiency of Cities *Urban Studies*, Volume 36, Number 11.
- Saez, Emmanuel and Thomas Piketty (2003), “Income Inequality in the United States, 1913-1998”, *Quarterly Journal of Economics*, 118(1), 1-39.

Schrank, David and Tim Lomax (2007), *The 2007 Urban Mobility Report*. Texas Transportation Institute.

Sussan, A. P., and Recascino, A. (2007). The challenges fostering the global Internet access: Free trade, and censorship. *International Journal of Business and Public Administration*. 4(1) 17-20.

The Brookings Institution (2007) *MetroNation: How U.S. Metropolitan Areas Fuel American Prosperity*., Metropolitan Policy Program, Washington, D.C.

The Eddington Transport Study (2006), *Main Report: Transport's Role in Sustaining the UK's Productivity and Competitiveness*. Prepared for the HM Treasury and Department of Transport, London, UK.

Transportation Research Board (2007) *Future Options For The National System Of Interstate And Defense Highways*, NCHRP 20-24(52), , based on forecasts prepared by Global Insight, Inc.

United Parcel Service (2007), *Getting America Moving Again*.

US Environmental Protection Agency (2002), *The Clean Water and Drinking Water Investment Gap Analysis*, EPA-816-R-02-020, Office of Water, Washington D.C.

Water Infrastructure Network (2000), *Clean and Safe Water for the 21st Century: A renewed commitment to water and wastewater infrastructure*.

AUTHOR(S) BIOGRAPHY

Aysar Philip Sussan, D.B.A is an Associate Professor and Chair Department of International Business at Bethune - Cookman University in Florida, U.S.A. He received his B.S. and M.S. degree in Industrial Engineering from Columbia University in New York City, and a D.B.A degree in International Business from Nova Southeastern University in Florida. Dr. Sussan is a senior member of (IIE) The Institute of Industrial Engineers. He teaches and conducting research in the area of strategic management and global applications in service organizations. He has more than fifty research papers published in a variety of journals. Also, he serves in the Editorial Board in seven academic journals, and reviewed many academic research papers for publications, as well as serving in the dissertation committee for Ph.D., DM, and D.B.A. students. He provided training seminars in the area of management for AT&T, American Express, Bell South, Dow Chemical, Westinghouse Nuclear Facilities, Halifax Trade Council, International Trade Association, and many others. He taught and provided training seminars in management concepts in a variety of nations such as, The Middle - East, France, Poland, Canada, Jamaica, Costa Rica, and the Caribbean Islands.



Alexander Heil, Ph. D is an economist with Camp Dresser McKee, Inc., a civil engineering firm headquartered in Cambridge, MA and a Member of the Faculty Research Council at the University of Phoenix. Dr. Heil has significant experience in asset management, determination of benefits and costs of large infrastructure projects and the economic impacts of public and private projects. He also holds academic positions in the economics department at Merrimack College and has in the past lectured in the Urban and Environmental Planning Department at Tufts University. He completed his doctorate at the Wales Transport Research Centre at the University of Glamorgan and has compiled a comprehensive body of research on transportation economic analysis, asset management and modal choice analysis.