A Peer Review of the Impact Modeling by Martin Associates for JAXPORT Regarding Dredging to 47 feet

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JAXPORT requested that as a faculty member in the Department of Economics and Geography in the Coggin College of Business at the University of North Florida, I perform a peer evaluation of the economic impact modeling performed by Martin Associates. The process of doing so necessitated the evaluation of the April 1, 2009 Martin Associates impact study for fiscal year 2007/08, the April 4, 2012 Business and Market Analysis, the April 11, 2013 Economic Value report for deepening to 47 feet, and two Powerpoint presentations from February 25, 2013 and September 10, 2013. In the process of performing my evaluation I also reviewed several articles, letters, and one video related to objections to the dredging of the channel. Ostensibly, JAXPORT asked that I answer four questions relative to the work of Martin Associates. The short answers are contained below in the section entitled Summary. The justifications for these answers follow in the second section titled Further Detail.

Summary

The four questions I was asked to address are as follows:

1) Review the economic impact model developed by Martin Associates. Comment on the validity of the model methodology. If we are providing the right input to this model, is the economic impact calculation going to reflect an accurate estimate?

2) Is this particular model and methodology the correct, and best, process to use for a project such as this?

3) Is there anything else that we should be looking at, or be seeking, to ensure that the information we are getting from this model is accurate?

4) Does UNF feel there is anything in this model that needs to be updated or changed?

My answers in the order of the questions are:

1) Presuming that the inputs of the model are valid, the model effectively and accurately develops the economic impacts of the revenues net of construction and mitigation costs from dredging the St. John's River to 47 feet. Martin Associates viewed the options for JAXPORT as 1) maintaining the current depth of the river and thus their current business model serving smaller ships, or 2) deepening the river to permit Panamax ships to enter the Port of Jacksonville. The stance that the modeling takes is that if JAXPORT chooses to maintain the status quo, business will be lost to other ports in the United States and the Caribbean. Thus, this lost business accurately depicts the standard concept of opportunity cost (the highest valued alternative foregone when making a decision) of choosing not to deepen the river. Martin Associates employs data from their survey of virtually the entire population of current companies at JAXPORT (410 in all) to assess the current business climate relative to employment, revenues, and costs. Their projections of the opportunity costs reflect both future trends in current business lines as well as systematic projections of what additional business might accrue if the river is deepened. The opportunity costs of potential future revenue losses are therefore the difference between the projections of the future under no change in the depth of the river, versus after deepening, in present value terms. Martin Associates employs the current discount rate of 3.75% employed by the Army Corp of Engineers as well as a 5% rate to provide some sensitivity analysis. I checked all of the calculations relative to the projected net present value estimates and the ROIs. The only error that I discovered in this regard, which was inconsequential, was on page 7 of the April 11, 2013 report where in Exhibit 4 the discount rates reported were the reverse of how they were actually applied. Again, if the inputs in the model are accurate, the findings suggest that concluding that the river should be deepened to 47 feet is so overwhelmingly positive in terms of ROI and from a benefit-cost standpoint, that the project should be undertaken. It is also important to note that some of the other ports on the east coast will be engaging in the same deepening of their ports, so expeditiousness will enhance the likelihood of acquiring new business.

   By combining the population survey and employing RIMS II, Martin Associates generates standard estimates of the direct, induced, and indirect jobs that would be anticipated to be generated by the river deepening. Naturally, as revealed in the reports, the numbers of jobs will grow with the additional business projected over the 32 year time frame covered. Martin Associates also provides three accurate estimates (assuming the inputs are precise) of alternatives with moderate penetration into new business, aggressive penetration, and aggressive business acquisition with intermodal penetration. Providing these three alternatives allows for further sensitivity analysis relative to the magnitudes of potential opportunity costs.

2) The methodology is standard and very much in keeping with most types of economic impact studies. In each such case, the researcher should identify the state of the world both with and without the event that is being considered and determine the present value of the differential between with, and without, conditions. The one unique characteristic of the Martin Associates report is that they have a population survey from which to extract the initial conditions. This is generally better than what economic impact modelers have to work with in these analyses. On the negative, yet unavoidable side, Martin Associates must depend on the Corp of Engineers for data on the costs of the project. This is not to imply that such data are incorrect, just that such estimates reflect a component of the impact analysis outside of the control of the researchers.

3) I had some difficulty determining where the estimates of the growth rates of new business come from in the April 11, 2013 report. This falls within the inputs discussed in question 1. It is important to understand two things about these estimates. The growth in post-deepening revenues is predicated on a shift of business from western ports to eastern ports following recent trends. However, the entire growth of new business is derived from the **Florida ports** taking over business redirected from the **west coast ports**. Further, the shifted trade is presumed to have as their initial points of origin, or ultimate destinations, **here in Florida**! Martin Associates differentiates between Jacksonville acquiring one third (the other two thirds going to Miami and Tampa) of the new business from either one quarter or alternatively one half of the 310 million TEUs anticipated to be shifted from west coast ports to east coast ports that have connections to Florida. There seems to be a misconception among some critics of the channel deepening that the Martin Associates estimates are dependent on how much new freight goes through the Panama Canal due to the larger ships or that the opening of the canal to larger ships in 2015 will greatly increase business in shipping. The Martin Associates estimates **only imply continuation of the current growth trends** in overall shipping business overall.

4) Since the Army Corp of Engineers final estimates of the dredging and environmental costs are not yet available, this is a source of adjustments that may be need to be made to the April 13, 2013 Martin Associates report. However, doing so is very simply if the costs can be assumed to accrue in present value dollars. One need only adjust the magnitude of the subtraction from revenues in the ROI numerators, and change the denominators, to reflect the new cost estimates. Any revisions to the $800 million estimates of the costs of the deepening project do not influence any of the jobs estimates. A second very minor adjustment necessary will be to shift the time frame of the project to when it actually commences rather than in 2013 since clearly the current reference date in the Martin Associates report is too early. With everything else equal, this should raise the benefits of the project by a small amount simply based on time value of money considerations (although the cost estimates will likely have to be adjusted upward for inflation as well). A third point to emphasize is that all of the estimates generated by Martin Associates are predicated on the Mile Point

problem being solved, but not entirely on the inclusion of related distribution center and intermodal changes that may occur. In this question the request was for "UNF" to conclude regarding the Martin Associates reports. I can only report for myself, but I did discuss the deepening project with Dr. Robert Frankel, Director of the UNF Transportation and Logistics Flagship Program, and Dawn Russell, a faculty member in the Marketing and Logistics Department who is the most well versed faculty member in port related transportation and logistics.

Further Detail

1) Qualifications of Martin Associates

The principal researcher at Martin Associates is John Martin. Dr. Martin received his Ph.D. in economics from George Washington University in 1978. Virtually his entire career has been spent performing economic impact analysis first with Booz-Allen and then in his own company, Martin Associates, beginning in 1986. He indicates that he has performed over 500 economic impact analyses in his career and that his work has been reviewed by the Council of Economic Advisors and representatives of the Federal Reserve System, among others. Dr. Martin has four associates who assist him with his analysis, who have master's degrees in economics. I found that he and his associates' employ approaches which are systematic and consistent with standard practices in economic impact analyses. His April 1, 2009 report is an extremely thorough and detailed discussion of the revenues, costs, and profits for JAXPORT in the 2007/2008 fiscal year and this information provides background for estimates of future earnings, growth, and costs for the Port. In this document, Dr. Martin and his colleagues provide estimates of the economic impacts restricted to 2007/2008 from the Cruise Terminal and from various product lines in the trade business. Martin Associates also provides estimates of jobs impacts that are likely to be exceedingly accurate given that they are derived from a population survey of the Port employers. The remainder of the jobs not identified as direct, are estimates from the Bureau of Economic Analysis RIMS II data base for 2005 based on multipliers specifically reflective of the Jacksonville MSA. This is standard operation procedure for economic impact modeling along with the processes for converting estimates of revenues and costs to present value employing the prevailing acceptable discount rate. The company that performed this analysis, Martin Associates, possesses the qualifications, and employs standard methodologies to estimate the economic impacts that are relevant, and the jobs that correspond to the port industry in Jacksonville.

2) The Present Value Estimates of Net Revenues

Since there are actually multiple estimates of the present values of the opportunity costs of not deepening the St. Johns River channel in the three Martin Associates reports that I considered, I will focus on the most recent from April 2013. The potential lost revenues from not deepening the river to 47 feet come from two sources – loss of current Asian business that will go elsewhere if the new Panamax ships cannot enter the Port of Jacksonville, and future first inbound port calls from business shifted from the west coast ports to the east coast, **exclusively reflective of products going to and from the state of Florida.** Martin Associates estimates this trade at 2.8 million TEUs annually in total (3.1 million in the latest Powerpoint presentation). The estimates of lost revenue from these TEU's for JAXPORT is not, however, all of this 3.1 million. Rather, the estimated losses for JAXPORT are assumed to reflect 1/3 of either ¼ or ½ of this amount with the rest expected to flow through Miami or Tampa. In terms of specifics, based on 2013 having been the first full year of revenue enhancement had the port been deepened, Martin Associates projects net new revenue of around $175 million. This amount is assumed to grow very rapidly for the first six years (25-26% per year) and then slow down to between 3 and 4% growth thereafter. It is customary that growth in new business will be more rapid in early years than later based both on smaller magnitudes to start and greater innovation in early product cycles. I cannot determine whether the early years estimates are excessive or low, but the fifteen years subsequent to the first seven reflects growth at or below historical average trends in the Port growth provided in the 2009 report. I conducted some of my own sensitivity analysis on the low side. Employing a growth rates in these first seven years of only 13% (half as much as Martin Associates projects) combined with the 3-4% growth thereafter would still generate a ROI above the value of 7 from the Seaport Project Evaluation Process Summary reported as a high priority project, using the 3.75% discount rate. It seems quite feasible that this lower growth rate would easily be attainable given the projections of Jacksonville's cost advantages in specific product lines (e.g., automobiles) and the inland travel advantages for products headed to the north Florida region, Orlando, and potentially Atlanta (see pages 24-28 of the April 2012 Martin Associates report). Being extremely pessimistic, with growth of only 1% per year throughout from the initial estimate of $175 million in new revenues, the ROI would still exceed break even by over double (ROI of 2.24). It is also valuable to note that because some of the opportunity costs of not dredging will mean a decline in current business in the diminishing Puerto Rico market; by not dredging, JAXPORT risks losing a significant portion of its current business that would have substantial negative ramifications for the thousands of jobs in the MSA already derived from the Port.

Martin Associates employs the current Corp of Engineers discount rate of 3.75% to bring future revenues and costs to present value. I investigated several other impact studies for port projects and discovered discount rates of 2.5% on the low side for a 2010 project in Virginia to 6.875% for a 2002 dredging project. Two 2013 projects, one by the Army Corp and another for Boston both used 3.75% like Martin Associates. It is not surprising given the very low current interest rates that the discount rates employed have fallen over the last decade. By employing 3.75%, Martin Associates is consistent with the other studies currently being conducted. By also employing the 5% discount rate, the analysis being reviewed here provides estimates on the lower side for more conservative ramifications.

One additional concept bears mentioning. The deepening of the Port, if undertaken, will not only generate benefits through 2035, but for many years thereafter. The present value of impacts that far into the future would not change the Martin Associates estimates very much. However, not deepening now may preclude the option to deepen at a reasonable cost, say 20 or 30 years from now, and so the losses may multiply exponentially if the Port falls to keep pace with other seaports and ship sizes.

3) Jobs: Direct, Induced, Indirect and Related

Martin Associates projects based on the increased TEUs either extracted from west coast ports or saved in current Asian business that 25,550 net new jobs will be created by 2035. It is important to note that these jobs will not all of a sudden materialize in that year. As port revenues grow from the present to 2035 the jobs will accrue gradually. These jobs fall into one of the three categories of direct, induced, or indirect positions. There seems to be some misunderstanding by opponents of the deepening of the river that Martin Associates claims that the related jobs will also accrue directly from deepening the river. As I read in an October 16, 2013 letter from Lisa Rinaman and my colleague in Sociology, David Jaffe, they disputed the additional nearly 43,000 jobs in the 2009 Martin Associates report identified as related. Dr. Martin is explicit that these jobs do not accrue directly from deepening of the port. In a telephone conversation with me last week, he emphasized that these related jobs are not directly resultant from the Port deepening. However, even if these jobs are not directly tied to the Port, or the deepening of the river, they are trade related. If not deepening the port means a loss of trade through the Jacksonville area, then it is likely that some of these jobs might be relocated elsewhere. Consequently, more trade through JAXPORT should mean maintenance of these jobs, and perhaps more. To err on the conservative side, 25,500 new jobs by 2035, based on standard input-output analysis (the RIMS II process) is still a sizable number of jobs. To put it into perspective, if the Jacksonville MSA current labor force of 707,008 grows by 1.3% per year like it did from 2012 to 2013 for the next 22 years, these 25,500 new jobs would reflect 2.7% of the labor force. If one takes the low base incremental job growth from the 2009 Martin Associates report of 6,240 jobs by 2040 as derived from just normal port growth, deepening the port would add another three times the jobs!

4) Taxes to the State and Related Net Benefits

On page 6 of the 2013 report, Martin Associates projects additional tax revenue from the new business at JAXPORT of nearly $93 million. While this is a sizable amount, it is important to note that some of this amount reflects maintenance of current revenues. If Port business declines due to competition from other ports that redirects business away from the State of Florida, the state will lose tax revenue that they count on currently. In addition, the loss of revenue from Port sources would presumably begin as soon as the deepening is not undertaken, and larger ships begin service, thus reducing tax revenue by increasing amounts between now and 2035. Related to this reality are the components excluded from the Martin Associates analysis. The sizable anticipated benefits from distribution center activities are not included in the present value estimates. In addition, if shifting business to the deeper Port of Jacksonville reduces transportation cost for shippers, those economic benefits are also ignored, implying significant conservatism. Finally, and most beneficially for Florida versus the nation as a whole, a portion of the entire costs of the dredging inherent in the $800 million dollar estimate of the deepening project may be shifted to the federal government (although the vote last week in Congress is not beneficial to this outcome), reducing the net costs and enhancing the return on investment to the State of Florida.

Conclusions

After a very careful review of the Martin Associates analyses of JAXPORT and the proposed deepening of the St. Johns River, I find the analysis in keeping with standard techniques in economic impact techniques, and accurate and compelling relative to the expected increased business to JAXPORT associated with being able to increasingly become a first port call for business from Asia. I agree with the assessment provided to me by telephone from Dr. Martin that the officials at JAXPORT will not have this new business simply fall into their laps if the river is deepened, however. The Port officials will have to work to explain and generate the competitive advantages that will motivate shippers to bring their products to Jacksonville that previously went to the west coast of the United States before arriving eventually in the State of Florida.

While I have significant experience in conducting and reviewing economic impact analysis in a variety of industries, my knowledge of logistics and Port economics is not as strong. I asked Rob Frankel, Director the UNF Flagship Program in Transportation and Logistics to provide his opinions regarding the issue of port deepening and the article *Panama Canal expansion: game changer, or more of the same* that appeared in the Journal Supply Change Quarterly just last week. He was not particularly optimistic, like the author of the article, regarding Jacksonville's ability to take business away from Charleston or Savannah. However, he was actually more optimistic than the Martin Associates documents regarding the intrastate competitiveness of Jacksonville versus the other ports in the state. He perceives that if any port in the state derives deepening of its port it will be Jacksonville.

> However, very importantly, conditions change over time regarding freight movements, as well as shipper and customer (retailer and importer) strategy. The author's article clearly supports such change; look at what has happened over the past 6-10 years. The shift to the increasing use of inland ports (for inland transloading and improved customer service) has been a huge strategic shift; I would expect that change to continue. It provides increased flexibility with regard to inventory reduction and also inventory deployment. It also provides flexibility in regard to shifts in population, which have also become important. What it doesn't address is how the increased diversity of inventory distribution points (eastward) will impact container/trailer imbalances that are/will build up over time and related lack of product/inventory flows westward to "balance" the situation; the carriers will have to figure out a "re-balancing" strategy of some sort because this is a cost to someone in the supply chain.

His point is that the shipping business is already (constantly) in flux with shippers searching for greater economies in processes and procedures. If Jacksonville can generate economies that improve efficiencies for shippers resulting from the Port deepening, then the shippers will come to Jacksonville to distribute their Florida goods. Not accommodating these realities would be a sizable miscalculation and a missed opportunity. Dawn Russell opined that “I just read Robb's assessment and he hit a lot of key points.”

It is evident that the Port of Jacksonville has an opportunity to enhance its revenues and expand local employment that is both direct and related, by deepening the St Johns River. The revenue estimates by Martin Associates clearly support the substantial returns to Jacksonville and the State of Florida from investing in deepening the river to enhance more water traffic and to serve the bigger ships that will become the modes of water transportation in the near future. Even if the mitigation expenses of deepening the river are substantially above what current estimates suggest, the revenue growth potential is so overwhelming that the project would still generate wide ranging benefits to the Jacksonville MSA and the State of Florida as a whole.