"*DRAGON vs. TIGER" – WHICH COUNTRY IS A MORE ATTRACTIVE OFFSHORE OPERATING DESTINATION*

Decision Making in a Complex Environment

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1. The decision problem

There is a lot of speculation in the business world today as to who is going to be the emerging leader in the Asian markets. While China clearly dominates the commodity market in Asia and the world with majority of the manufacturing processes from auto and steel industry to small scale industries, India dominates service based business with large Business Process Outsourcing, Software Development and Research and Development Centers. This project aims at analyzing the growth prospects for four different alternatives for India and China in the next 5 years. It takes into consideration qualitative and quantitative data for the two countries to make a decision as to which sector has better growth prospects in the next five years. The four alternatives are:

- **India – Manufacturing**
- **China – Manufacturing**
- **India – Services**
- **China – Services**

2. Goal

To determine which country is a more attractive offshore operating destination for the manufacturing and services industry.

3. Model Used

Under the benefits, opportunities, costs, and risks models (BOCR models), different clusters define interactions with respect to the control hierarchy established.

The benefits networks indicate the alternatives that yield the most benefit and the opportunities networks indicate the alternative that offers the most opportunities, whereas the costs and risks networks indicate the alternatives that are the most costly or pose the most risk for each alternative

The flow of the decision process is to first build the networks and sub-networks for each of the BOCR model. The importance of the BOCR must then be determined by rating them with respect to the strategic criteria of the organization or decision maker. Strategic criteria are those values that must be satisfied regardless of the particular decision being made. The BOCR are not equally weighted in every decision, and to establish their priorities in this decision by rating the most important alternative (the one with the highest value which is the best under benefits and opportunities, and the worst under costs and risks) against the strategic criteria.

4. Strategic Criteria

There are numerous criterion which can be considered while evaluating a decision on investment in a country. Most of them are interrelated and can bias the decision because they might get weighted twice for the same criteria. For our analysis, we narrowed down to few strategic criteria which are most important for a country in terms of emerging as an economic power. Since our analysis is based on manufacturing or services capabilities of the two countries, we chose the following strategic criteria:

4.1Economics

The economics of a country are the most important aspects in its becoming an emerging power. We considered economic sub-criteria such as currency exchange, economic growth, investment climate and privatization.

The Chinese economy is much more integrated with the world economy through international trade and investment, which helps to explain its stronger rate of GDP growth during most of the past 3 decades. For its economic development, China has relied on industry and India on services. China's ratios of domestic savings and investment to GDP are roughly double those of India's. Both economies currently enjoy strong external positions, with ample foreign exchange reserves. Higher oil prices are not likely to have a significant adverse impact on external liquidity. China and India have low external debt as a percentage of GDP, and the ratio of short-term external debt to foreign reserves is low.

Despite declining fiscal deficits, the level of public sector debt is a cause for concern, especially in India. In particular, interest payments as a percentage of general government revenue are very high in India, making the prospect of fiscal consolidation more remote. Excess domestic liquidity presents a bigger challenge to China than India. China is heading toward 200% of GDP with domestic credit almost 170% of GDP. This explains the rapid rise in CPI inflation during 2004, on which the Chinese authorities are still keeping a tight rein.

India has better corporate governance standards and its companies are more commercially-driven. This explains why, despite China's superior economic growth and macroeconomic stability, India's rate of return on assets has been much higher, non-performing loans in the banking sector lower, and stock market performance much better.

4.2Infrastructure

Hard and soft infrastructure development is a key to a growing and successful economy. Hard infrastructure means transport systems, roads, airways, and city planning. Soft infrastructure, typically includes development of a service based

infrastructure. While clearly China has the former, India is leading in the later. Having said that, both countries are competing to improve their weak points.

4.3Political

Political atmosphere has a direct impact on the economy. While China is a communist country, it has still done a great job in attracting foreign investors and businesses. Though some people argue that doing business with China is definitely cheaper and riskier than India, given the dominance of its ruling parties in businesses. India on the hand is a democracy, has less regulation and is less risky than China. Surprisingly we found that the corruption index in China was greater than India, which is what most businesses are afraid of when they plan to open centers in these countries. While privatization has been supported by the Indian government, the Chinese government still plays a very important role in businesses in China. The latest is the TD-SCDMA standard being pushed by the Chinese government, which essentially wipes out all other 3G wireless standards competing in the Chinese market. The sub-criteria that we considered in political criteria is foreign relations, government support in business, and political power that these countries exert in the world trade organization and the United Nation. China clearly emerges as the winner as it has a seat in the UN Security Council.

4.4Technological

Technological infrastructure is very important when a country wants to compete in a global market place. While China is more technologically advanced than India, this advancement is mostly in the consumer electronics market, which depends heavily on manufacturing. On the other hand, India has a lot of service based

technological infrastructure which is the reasons for companies opening up call centers, software development offices, and back offices in India. On the services side of the industry even though both countries have a problem in dealing with theft, and fraud in the databases, China has a bit piracy issue. The government of China is taking steps to stop this, but it will take a while before this issue comes to a minimum or stop.

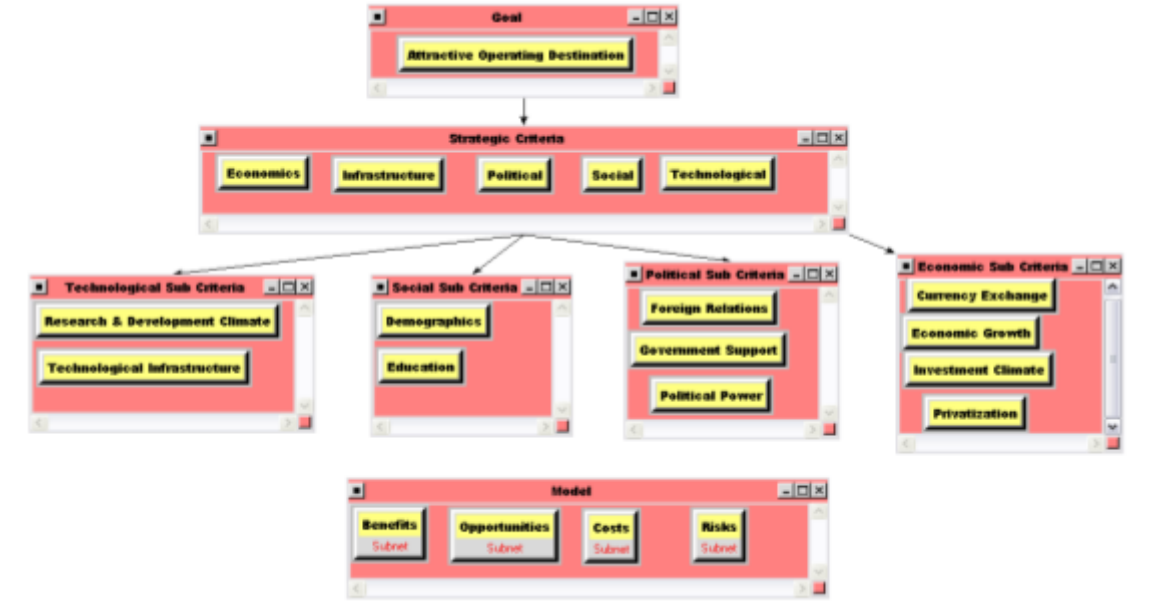
4.5Social

Perhaps the most positive aspect of India's future is its demography: India is a very young country, while China, because of its one-child policy, is rapidly aging. According to the UN demographic Commission, by the middle of this century the most densely populated age group in India will be those aged 40 to 50, while in China it will be those aged 55 to 65. This means China will soon start to suffer the same problems as Japan, Western Europe and the United States: an excessive number of retirees relative to the working population.

The young have the flexibility to adapt, absorb, conceptualize, and innovate. This is the key ingredient of technological and economic progress. China has a large supply of new workers for private enterprises, but these workers are leaving state-owned enterprises and are older and are not as adaptable as the young labor market in India. The late management guru, Peter Drucker, said that demography is the "future that happened." Population trends are not easily reversible, and here the advantage goes to India.

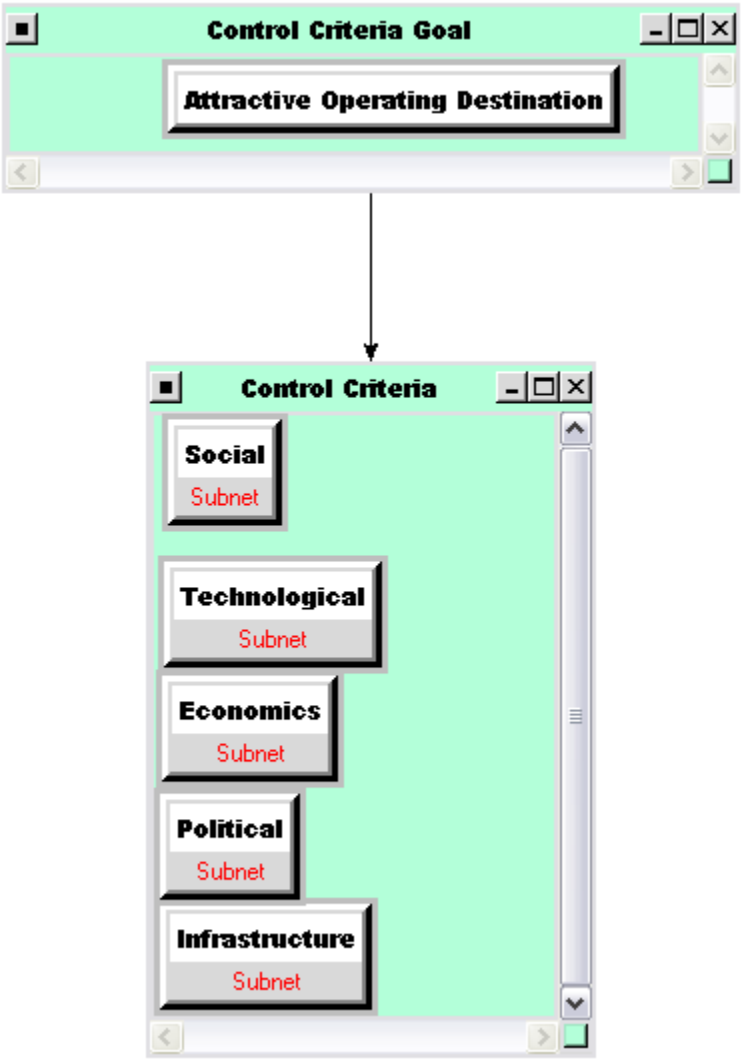
5. Model Building

The model was built on the control criteria explained above. Some of the control criteria were broken down into sub-criteria. Node and cluster comparisons were done to determine the appropriate priorities. Below is a screen view of the model.



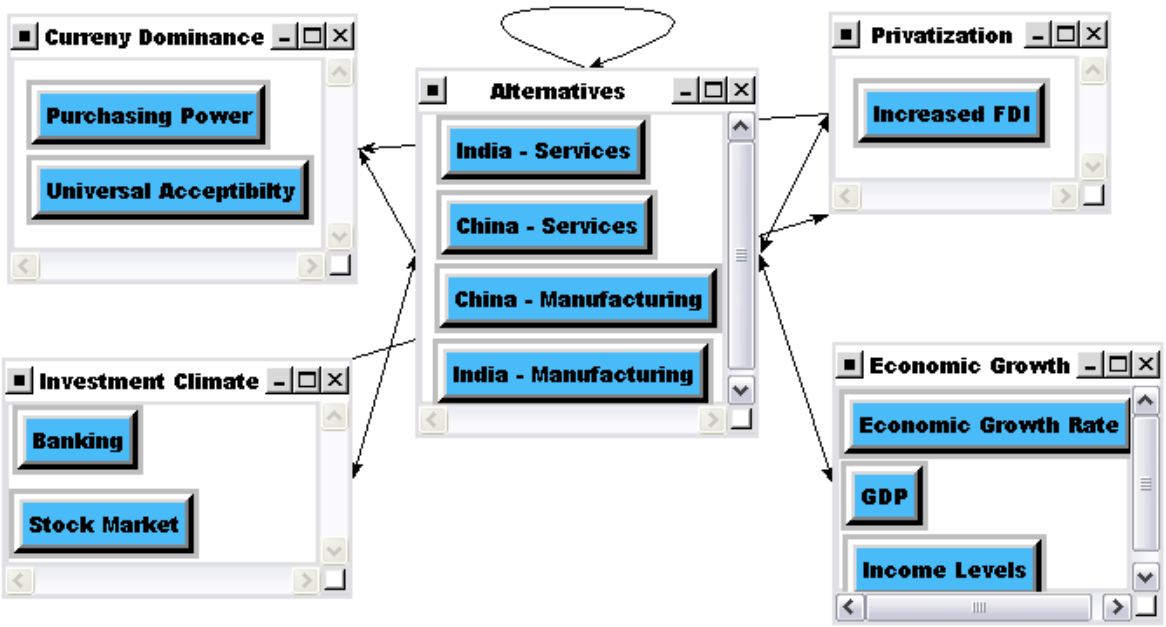
6. Subnet Control Criteria

The subnets under the benefits, opportunities, costs and risks criteria were built on the basis of the relevance of the subnet control criteria to each of the BOCR criteria. Eg. For the benefits, social, technological, infrastructural, Political and Economics were considered as the control criteria. All these control criteria are not equally important for opportunities, costs and risks. Hence the appropriate control criteria were chosen and rated for each of the subnets. A snapshot of the subnet control criteria for benefits is given below:



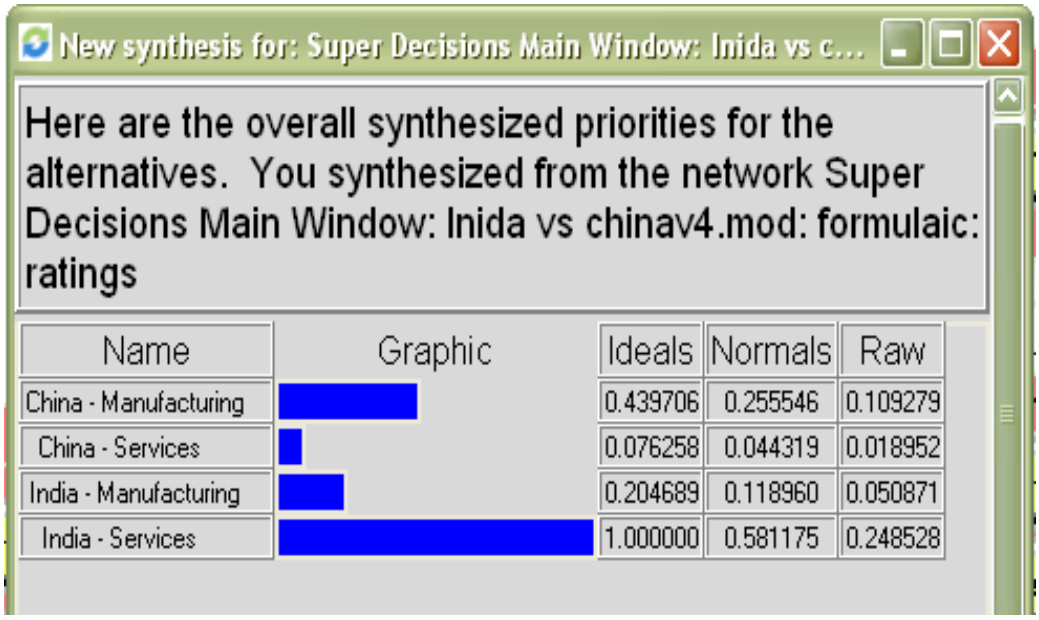
7. Inner Subnet

The inner subnet was built under each of the subnet control criteria. This inner subnet was built by brainstorming and coming up with criteria that are most important for that particular subnet. For eg. in Benefits → Economics, we created clusters: Currency Dominance, Investment Climate, Economic Growth and Privatization; the most important factors affecting Economic Benefits. Under each, another set of factors were chosen affecting each. A snapshot of the inner subnet is shown below.



8. Model Synthesis – Final Answer

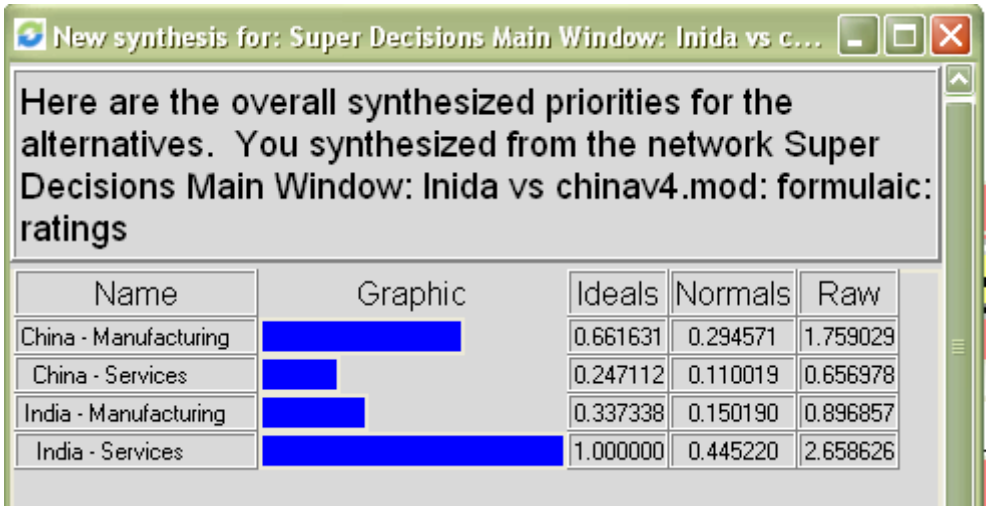
8.1 Additive Model



From the above results it can be seen that India – Services is the most attractive offshore destination for the Services industry, followed by China –

Manufacturing. India – Manufacturing is more attractive than China – Services in the long term.

8.2 Multiplicative Model



From the above results it can be seen that in the short term India – Services is the most attractive offshore destination for the Services industry, followed by China – Manufacturing. India – Manufacturing is more attractive than China – Services. The multiplicative model does not give us negative normals, which means that neither option is very bad in terms of an offshore destination. While all four alternatives have positive normals, the multiplicative model tells the extent to which one is better over the other.

8.3 Interpretation

In this BOCR model, we get the same results for the short term or the long term goal. China – Services which is the least preferred still has a higher weight (11 %) in the short term, than in the long term (4.43%). In the short term, it looks like China – Services could catch up with India – Manufacturing. Overall neither the short term or the long term model suggest any significant difference in

the decision making process. The multiplicative model, does not give a negative rating to any of the alternatives, which means that it still remains a viable option.

8.4 Decision Rating Model

We used the criteria described before to rate the benefits, opportunities, costs and risks with respect to:

- Currency Exchange
- Economic Growth
- Investment Climate
- Privatization
- Foreign Relations
- Government Support
- Political power
- Demographics
- Education
- Infrastructure
- Technological Infrastructure
- Research and Development

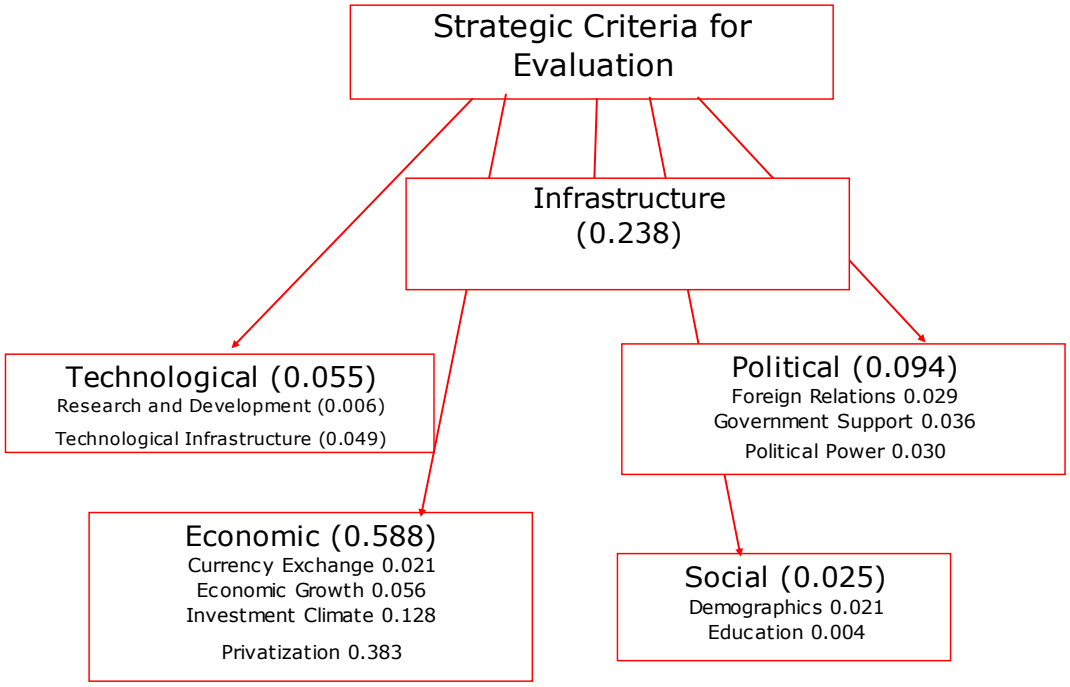
The above criteria was further broken down into sub-criteria in the subnets for benefits, opportunities, costs and risks.

We gave the following ratings to the model in order to derive at the priorities:

	Currency Exchange	**Economic Growth**	**Investment Climate**	**Privatization**	**Foreign Relations**	**Government Support**
Benefits	High	High	High	Very High	High	High
Costs	Very High	Very High	Very High	Very High	High	Very High
Opportunities	High	Medium	Average	High	Medium	Medium
Risks	Medium	High	High	High	Very High	High

	Political Power	Demographics	Education	Infrastructure	Technological Infrastructure	Research and Development
Benefits	High	Medium	High	Very High	High	High
Costs	High	High	Very High	High	High	High
Opportunities	Medium	Medium	Average	Medium	High	Medium
Risks	High	Medium	Below Average	High	High	Average

Based on the above ratings we got the following priorities for all the control criteria:



We can see from the above chart, that economic sub-criteria has the highest priority followed by infrastructure. This makes sense since the economic condition of a country which includes investment climate, stock market, foreign direct investment etc. could influence a company's decision to invest in that country. The infrastructure

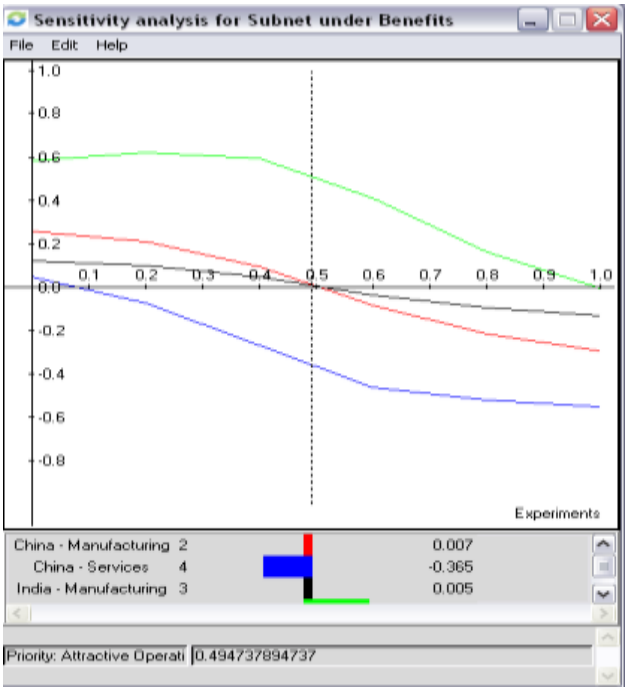
of the country also plays a critical part in the decision. Hard infrastructure includes transportation system, roads, railways and airways, which China is more advanced in than India. This makes it more attractive for manufacturing purposes as it involves a lot of transport and supply chain efficiency. Soft infrastructure is the legal system, the industry friendly policies which India has an upper hand on due to an increase in privatization and reduced government control. This is an important criterion for the services industry which banks heavily on privatization opportunities in places where it wants to outsource its operations.

Political sub-criteria has a higher priority over technological, because companies who outsource their operations also outsource a part of their technology. Hence, even if the outsourcer does not have the technical know-how, he has easy access to it. Since the political system of China and India are different, we thought that the stability or the instability that comes from these systems has more effect on the decision making process. If both the alternatives were a democracy, then priority of political sub-criteria would have been lower than the technological, and would change the decision based on the technological advancement and capacity that the two alternatives would have. We think if the political sub-criteria had less priority than the technological, then China – Services would have had a higher priority than India – Manufacturing as China has more technological infrastructure than India.

9. Sensitivities

9.1 Benefits

Benefits - Sensitivities



Sensitivities for Benefits:

Rank	Benefits Priority = 0.1	Benefits Priority = 0.5	Benefits Priority = 0.99
1	India - Services	India - Services	India - Services
2	**China - Manufacturing**	**India – Manufacturing**	India - Manufacturing
3	**India – Manufacturing**	**China - Manufacturing**	China - Manufacturing
4	China - Services	China - Services	China - Services

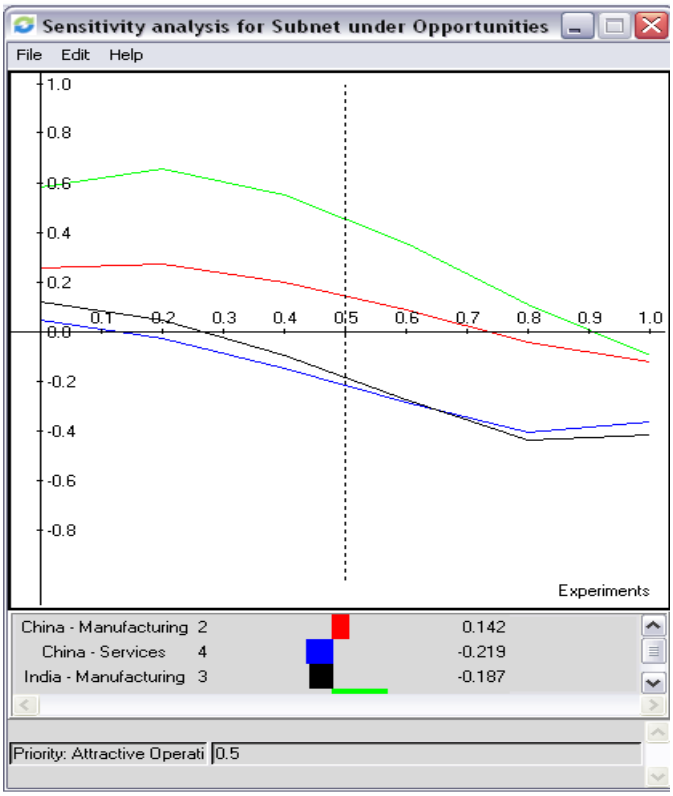
If the priority of benefits is changed from 0.5 to 0.99, then the ranking of the alternatives does not change. Whereas if the priority changes from 0.5 to 0.1, the ranking for China – Manufacturing and India – Manufacturing changes as indicated by the arrows above.

This makes sense, because when the benefits of manufacturing have a lower priority in the decision making process, the risks and costs could outweigh the

opportunities. There are more risks for India – Manufacturing since India is at an early stage in its manufacturing capabilities. Also, the costs of setting up a manufacturing unit in India would be higher as China already has the advantage of having set up many such units. Hence if the priority for benefits decreases the rankings would change as indicated by the sensitivity above.

9.2 Opportunities

Opportunities - Sensitivities



Sensitivities on Opportunities

Rank	Opportunities Priority = 0.1	Opportunities Priority = 0.5	Opportunities Priority = 0.90
1	India - Services	India - Services	India - Services
2	China - Manufacturing	China - Manufacturing	China - Manufacturing
3	India - Manufacturing	India - Manufacturing	China - Services
4	China - Services	China - Services	India - Manufacturing

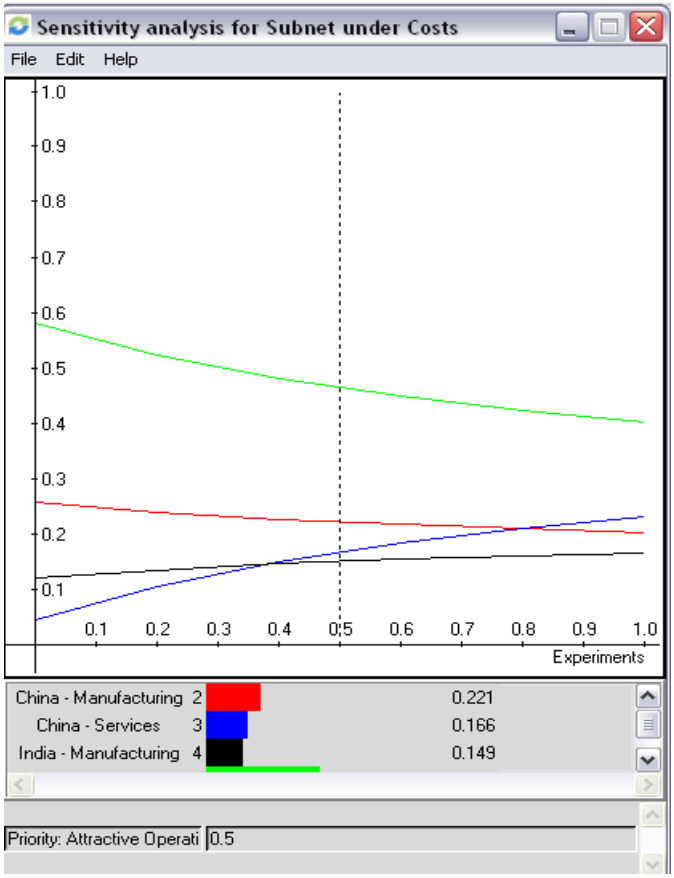
If the priority of opportunities is changed from 0.5 to 0.99, then the rankings of China – Services and India – Manufacturing changes as indicated by the arrows

above. Whereas if the priority changes from 0.5 to 0.1, the ranking do not change. I

If the priority for opportunities is increased in the BOCR model, then China – Services ranking increases from 4th to 3rd position. Again, this makes sense, because outsourcing services to China still has more opportunities than India. Increase in opportunities would decrease the priority to risks and costs and thus give China – Services an increased priority than India – Manufacturing. India – Manufacturing on the other hand, would be the least preferable option, as China – Manufacturing opportunities are high, costs are low and risks are low, as opposed to India – Manufacturing which would have high opportunities, but still have higher costs and risks than India – Manufacturing.

9.3 Costs

Costs – Sensitivities



Sensitivities on Costs

Rank	Costs Priority = 0.1	Costs Priority = 0.5	Costs Priority = 0.90
1	India - Services	India - Services	India - Services
2	China - Manufacturing	China - Manufacturing	China - Services
3	India - Manufacturing	China - Services	China - Manufacturing
4	China - Services	India - Manufacturing	India - Manufacturing

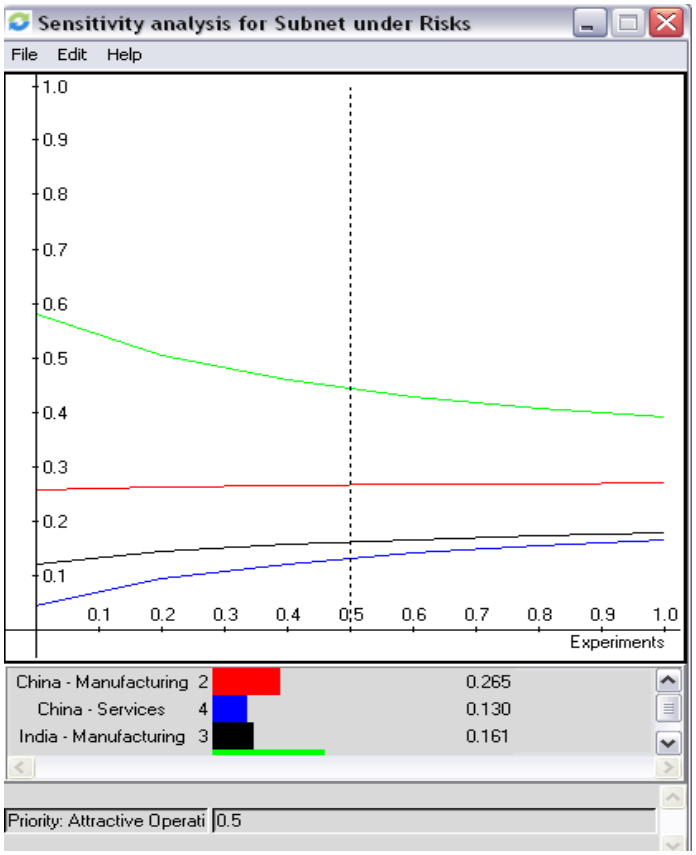
If the priority of benefits is changed from 0.5 to 0.99, then the rankings of China – Services and China – Manufacturing changes. Whereas if the priority changes from 0.5 to 0.1, the rankings for India Manufacturing and India – Services changes as indicated by the arrows above.

If the priority for costs is reduced from 0.5 to 0.1, then China – Services becomes the least preferred option. This makes sense, because if the priority for the costs of manufacturing in India is reduced, then the benefits and the opportunities are higher than in China – Services.

If the priority for costs in increased from 0.5 to 0.9, then the ranking for China – Manufacturing drops. Though, in reality this should not be the case. Our research suggests that China – Manufacturing is low cost than China – Services, and hence if costs are given more priority then China – Manufacturing should be more preferred than China – Services. The model was built up essentially in a way to decide between India – Manufacturing or China – Manufacturing and between China – Services or India – Services. Comparing Services and Manufacturing within the country was not the goal of the model and hence for the costs priority, even if it changes the preference for China – Manufacturing and China – Services, it still gives the correct results for the overall BOCR model.

9.4 Risks

Control Criteria – Risks



Sensitivities on Risks

Rank	Risks Priority = 0.1	Risks Priority = 0.5	Risks Priority = 0.90
1	India - Services	India - Services	India - Services
2	China - Manufacturing	China - Manufacturing	China - Manufacturing
3	India - Manufacturing	India - Manufacturing	India - Manufacturing
4	China - Services	China - Services	China - Services

If the priority of risks is changed from 0.5 to 0.9 or changed from 0.5 to 0.1, it has no effect on the rankings of the alternative. The risks subnet includes social, political and economic criteria which do not change as dynamically as technology or infrastructure. Within these criteria, political has the highest priority, which is not expected to change over the next 5 – 6 years. Hence, changing the priorities of risks, does not affect the preference of the alternatives.

10. Priority Tables for BOCR Model

The priority tables for BOCR model indicates the degree to which elements in the in the sub criteria are important in arriving at the decision. This model also indicates that if the priority of these elements changes the solution to the decision also changes. Below we have tabulated the overall priority of control criteria. The numbers in bold and reed in the overall priority of control criteria column indicate the highest priority within the sub-criteria.

BOCR Ratings	Control Criteria	Value	Control sub	Value	Overall priority of Control Criteria
Benefits	**Social**	0.043	Female workforce	0.026	0.001
0.2786			Labor work force	0.077	0.003
			Working population for Services	0.063	0.003
			40- 50	0.107	0.005
			55-65	0.109	**0.005**
			English Speaking Ability	0.035	0.002
			Higher Education	0.014	0.001
			Primary Education	0.019	0.001
	Technological	0.352	Piracy Regulations	0.085	0.030
			R&D investment	0.031	0.011
			Average	0.127	**0.045**
			Under developed	0.045	0.016
			Well developed	0.121	0.042
	Economic	0.304	Purchasing Power	0.022	0.007
			Universal Acceptibilty	0.085	0.026
			Economic Growth Rate	0.102	0.031
			GDP	0.036	0.011
			Income Levels	0.034	0.010
			Banking	0.070	0.021
			Stock Market	0.070	0.021
			Increased FDI	0.135	**0.041**
	Political	0.173	Corruption Index	0.025	0.004
			Foreign Relations	0.115	**0.020**
			Industry Friendly Policies	0.088	0.015
			Military Capability	0.008	0.001
			Regulations	0.062	0.011

			Communism	0.074	0.013
			Democracy	0.057	0.010
	Infrastructure	0.128	Hard	0.208	**0.027**
			Soft	0.125	0.016

For opportunities, economic opportunities have the highest priority, followed by political and infrastructure. As mentioned in the paper above, the banking system, foreign direct investment, GDP, economic growth rate etc. of a country have a great impact on the choice of an offshore destination. No company would like to invest in a country with a weak banking system, or a low FDI. The political environment of a country is also very important in the decision making process as it involves factors such as corruption index, foreign relations, government regulations, type of government etc. Though China has very high economic growth and a GDP 5 times that of India, its corruption index is surprisingly higher than India and it is also a communist country. Infrastructure is another important criterion, and China has an upper hand in hard infrastructure in India. If it was vice-versa, India – Manufacturing alternative would have a higher preference than what we derived from our decision making process.

BOCR Ratings	**Control Criteria**	**Value**	**Control sub**	**Value**	**Overall priority of Control Criteria**
Opportunities	**Technological**	0.186	Qualified Professional Engineer Pool	0.085	0.016
0.280269			Under developed	0.047	0.009
			Well developed	0.278	**0.052**
	Economic	0.732	Economic Growth Rate	0.178	**0.130**
			GDP	0.121	0.088
			Income Levels	0.019	0.014
			Banking	0.051	0.037
			Stock Market	0.062	0.045
			Increased FDI	0.088	0.064
	Political	0.082	Foreign Relations	0.136	**0.011**

			Industry Friendly Policies	0.104	0.009
			Regulations	0.052	0.004
			Communism	0.055	0.005
			Democracy	0.090	0.007

For the Opportunities subnet, we considered only technological, economic and the political control criteria. The economic opportunity had the highest weight of 0.732, in which the economic growth rate had the most priority followed by the GDP and the stock market. China has an advantage in the economic growth rate and the GDP but lacks in the banking and the stock market sector. We did not consider social or infrastructural opportunities as they would have been very insignificant in the model compared to the high weights given to the technological and economic criteria.

BOCR Ratings	Control Criteria	Value	Control sub	Value	Overall priority of Control Criteria
Costs	**Social**	0.045	Labor work force	0.031	0.001
0.20114			Working population for Services	0.031	0.001
			40- 50	0.038	0.002
			55-65	0.280	**0.013**
			English Speaking Ability	0.034	0.002
			Higher Education	0.013	0.001
	Technology	0.565	Manufacturing Infrastructure	0.011	**0.006**
	Political	0.118	Corruption Index	0.025	0.003
			Foreign Relations	0.062	0.007
			Industry Friendly Policies	0.095	0.011
			Regulations	0.063	0.007
			Stability	0.051	0.006
			Communism	0.099	**0.012**
			Democracy	0.038	0.004
	Infrastructure	0.271	Hard	0.246	**0.067**
			Soft	0.088	0.024

For the costs, we considered the social, technological, political and the infrastructural costs of investing in a country. The technological costs are the highest priority as the costs of transferring and supporting the technology to these low costs countries is considerable. Eg. Cost of setting up a call center in China would involve higher technological infrastructural costs because of higher government regulations on technology in China.

BOCR Ratings	Control Criteria	Value	Control sub	Value	Overall priority of Control Criteria
Risks	**Social**	0.041	Female workforce	0.030	0.001
0.239997			Labor work force	0.027	0.001
			Working population for Services	0.040	0.002
			40- 50	0.043	0.002
			55-65	0.273	**0.011**
	Economics	0.186	Economic Growth Rate	0.074	0.014
			GDP	0.018	0.003
			Banking	0.100	0.019
			Stock Market	0.237	**0.044**
	Political	0.665	Foreign Relations	0.125	0.083
			Industry Policies	0.132	**0.088**
			Regulations	0.052	0.035
			Communism	0.070	0.046
			Democracy	0.048	0.032

Between China and India, political risks have the highest priority, which makes sense because a majority viewpoint that communism is deterrent to advancement of a country socially and economically. As mentioned above, economic growth rate of China is higher than India, and the GDP is also 5 times that of India, which makes India a risky proposition in the decision making process.

11. Conclusion

As per our analysis, we have come to conclude that India would be a better country to enter in the services sector and China in manufacturing. China today is far ahead of India, with an economy that's twice as large and growing faster. But China has vulnerabilities over the long term, including some of the very factors that now appear to be making it super competitive. The same lack of the rule of law and due process that allows it to quickly bulldoze homes for skyscrapers, for example, has also led to corruption, rising inequality and social unrest. Conversely, India's apparent weaknesses – a cumbersome democracy, lack of central planning and unrestrained population growth – are precisely the factors that could result in its leadership in the long term.

China has used its power to mobilize and direct resources, China's authoritarian leaders have adopted an export-led growth strategy. Strong incentives have been created to produce national savings of more than 40 percent of GDP, (U.S. savings are negative), and the money has been guided into investments in massive public infrastructure projects and export-oriented manufacturing companies. Foreign direct investment has also been assiduously courted in "strategic" targeted industries, and enormous productive capacity far in excess of domestic needs has been created to serve global markets. The combination of massive investment and inexpensive but easily trained labor has made China the global location of choice for production of everything from textiles to semiconductors.

China's demographics are worrisome. In another ten years the one-child policy will begin to bite as China's population starts to age rapidly and eventually to shrink. By 2020, the age pyramid will become sharply inverted with too few young people trying to support too many seniors. If China doesn't run into problems sooner, this will

be the ultimate barrier to its continued economic growth. In short, China will get old before it gets rich.

India, in contrast, enjoys many, long-term advantages. Although its literacy rate is much lower than China's, it's Indian Institutes of Technology rival M.I.T. and are far better than similar schools in China. It is estimated that only ten percent of Chinese engineers have the skills required to work in a global company, while the comparable number for India is 25 percent.

And although India's democratic system can be cumbersome and slow, it is stable. The rule of law is well established and the legal system, based on English common law, is easy to understand and is reasonably transparent and predictable. That makes investment less risky than in an opaque, authoritarian environment. English is the common language of Indians this makes it easier for India to fit into an international business system whose lingua franca is English, as does the return in recent years of many skilled business people from the large Indian diaspora in America and Europe.

Another possible advantage is India's business culture. China's route to growth has been through its government's mobilization of resources. India's has been mostly a matter of the government's deregulating and getting out of the way of aggressive, private industry entrepreneurs, many of whom had experience in Silicon Valley. And these entrepreneurs have been focused on high tech and services.

As a result, India's growth has so far been based not on doing standard manufacturing less expensively as China has done, but on developing innovative new services and high-tech products. In the long term, that innovative, entrepreneurial culture is likely to have more staying power and productivity.

In sum, for a short-term investor, China is where the investment should be. But if an investor is in it for the long haul, India might be a better bet. The ideal

combination for any company would be to outsource its manufacturing operations to China and the services to India.