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**In a World of Shifting Trade Policies,
Which Region Is Best for Your Project?**

In a World of Shifting Trade Policies, Which Region is Best for Your Project?

By Curtis Campbell

Over the last two years, shifting trade policies have added complexity to outsourcing strategy. Tariff mitigation has become a factor in evaluating existing supply chain locations. However, as the threat of tariffs on products exported from Mexico demonstrated in mid-2019, choosing manufacturing locations based on solely on trade policy strategy may represent only a short-term solution. Trade policies such as tariffs are typically designed to achieve a short-term agenda. The cost implications of a transfer of work are typically far greater than the tariff cost they mitigate. Consequently, while shifting trade policies may trigger the evaluation of outsourcing strategy, the cost considerations and tradeoffs associated with the region often represent a far broader conversation. Periodic review of a sourcing team’s outsourcing

rationale and supply chain helps ensure the strategy stays cost competitive.

Table 1. Evolution of Labor Markets

Emerging

- Lowest labor cost
- Inexperienced workforce/low skills
- Often inefficient labor utilization or lack of automation
- Focus on consumer goods/lower quality expectations
- Minimal infrastructure
- Supply base may have gaps
- Communication may be an issue
- Highest potential for cost surprises

Established

- Better labor utilization and skills mix
- Turnover may be an issue if region is popular “safe” choice
- Increasing use of automation, but may be older equipment
- Mfg. business models may reflect preference for high volume product
- Fairly comprehensive supply base, but service issues may be present
- Communications issues may arise
- Popularity drives cost increases

Mature

- Best skills mix and labor utilization
- Higher tech automation
- Strong focus on higher level quality systems and CI initiatives
- High mix, variable demand support
- Highly specialized supply chain
- Strong communications and program management focus
- Business-friendly environment
- Good technical & educational infrastructure
- Predictable costs

A key point to consider is that emerging labor markets evolve in terms of cost structure over time. The lowest labor cost markets are often highly inefficient because manual labor is cheaper than the fixed costs of automation. As Table 1 shows, as a market grows in popularity, infrastructure develops and labor costs increase.¹ Efficiency improvements follow. Choosing a region simply based upon labor cost not only discounts the hidden cost of emerging labor market inefficiency, it also fails to consider the impact of transfer costs when that market is no longer the lowest labor cost option. For shorter lifecycle products with marginal quality requirements, this may be an acceptable set of tradeoffs. However, for products with longer lifecycles with superior quality requirements, the hidden cost equation will significantly outweigh quoted cost

savings.

Strategy development is further complicated by a changing workplace. Older workers willing to work long hours and travel frequently to remote parts of the world for weeks at a time are being replaced by younger workers looking for more work-life balance. This may drive more focus on aligning outsourced manufacturing in closer proximity to product development teams or affiliated manufacturing facilities.

Placing outsourced manufacturing in proximity to end market delivers benefits in terms of cost and responsiveness to demand variation.

Any evaluation should recognize that every region has advantages and disadvantages. This whitepaper looks at regional advantages/disadvantages in Asia, the U.S. and Mexico, from the perspective of SigmaTron International, an electronics manufacturing services (EMS) provider with facilities in those regions. It also makes recommendations for the project types likely to best fit in each region.

At the inception of contract manufacturing, original equipment manufacturer (OEM) outsourcing decision teams focused on selecting a contractor who could deliver quality products on-time at competitive cost. Geographic preferences were typically driven by end market logistics, labor content and product maturity. In the late 90s, China dramatically changed the playing field by devaluing its currency, investing significantly in infrastructure and making it easier for foreign companies to do business there. The devaluation was significant enough to cancel out the impact of logistics costs, making China sourcing attractive for a far larger variety of products. However, markets evolve and labor costs in China are increasing. The addition of U.S. tariffs have further eroded China's cost advantages and accelerated a shift of margin sensitive product manufacturing to Southeast Asia and Mexico, that was already in progress.

That said, China isn't a bad choice for manufacturing. It is simply a bad choice for projects that were a marginal fit, placed there simply on unit price considerations alone. China is growing as a market in terms of consumption. Manufacturing in China for products sold to the Chinese market is still the lowest the cost option. And when all costs are considered, manufacturing that was strategically considered a fit for China production, may still be better left there. The cost to move production from one region of the world to another is significant and may take six months to year to recoup. Conversely, rethinking the way production is done in its current region may drive enough cost reduction to eliminate or significantly reduce tariff impact without incurring significant project transfer costs. This strategy can often be implemented much faster than transferring out of the region because the supply chain does not need to be realigned and fewer tooling changes are necessary.

For example, one of SigmaTron’s industrial customers initially looked at moving production to Mexico to eliminate the China tariffs. SigmaTron was building their printed circuit board assemblies (PCBAs) and they were doing a large portion of the final assembly at their own factory in China. As a result, the declared value of their exported product was fairly high since it reflected the customer’s internal cost structure. However, the non-recurring costs of transferring work to Mexico was also high, particularly if the tariffs turned out to be a short-term policy. SigmaTron worked with the customer to transfer a significant portion of the value-add done in China to its Suzhou facility and optimized processes to reduce labor. The end result reduced the declared value of the product which also reduced the tariff cost.

Another benefit of the example above was no negative impact to quality after project transfer. The supply chain stayed the same and the assembly processes were optimized to reduce touch labor. Personnel from both facilities were able to interact easily in developing the optimized processes.

The best outsourcing strategies are built around evaluations of total cost which include product demand trends, production region and end market logistics factors, labor content and product lifecycle considerations. Finding a contractor who can offer a range of choices and discuss cost advantages/disadvantages of various regions can help support decisions which maximize flexibility to lower costs over time, while minimizing transfer costs during project migration.

As mentioned earlier, all labor markets have tradeoffs and these tradeoffs change over time. To better illustrate that, select country statistics from The World Economic Forum’s Global Competitiveness Report 2018-19 are shown in Table 2.^{2,3}

Table 2. Select Global Competitive Rankings 2018-19

Country	GCI Rank Current Report	GCI Rank 2016-17 Report	Macroeconomic Stability	Product Market	Labor Market	ICT (Tech) Adoption	Innovation Capability	
Singapore	2	2	42	1	3	4	14	
United States	1	3	34	3	1	27	2	
Malaysia	25	25	1	24	20	32	30	
China	28	28	39	55	69	26	24	
Czech Republic	29	31	1	47	47	42	29	
Poland	37	36	1	38	62	68	38	
Indonesia	45	41	51	51	82	50	68	
Hungary	48	69	43	82	83	51	39	
India	58	39	49	110	75	117	31	
Mexico	46	51	35	54	100	76	50	
Vietnam	77	60	64	102	90	95	82	

Source: The Global Competitiveness Report 2018-19 and 2016-17. World Economic Forum.

The 2018-19 report ranks 140 countries based on analysis of a variety of metrics. As the numbers in the chart show, mature labor markets often rank highest in factors related to productivity, technological readiness and ease of doing business, although as these numbers show, macroeconomic stability doesn't always go hand-in-hand. From a sourcing standpoint, it is important to determine whether tradeoffs in efficiency, logistics costs and ease of doing business that come with an emerging market are fully offset by the cost savings found in that market.

Thoroughly analyzing those costs requires evaluation of both easily measurable factors such as landed unit costs as well as hidden costs that can be more difficult to identify. Six areas that drive costs which are harder to measure include:

- Product demand variability
- Regulatory requirements in the end market
- Inventory taxation policies
- Differences in regional component pricing/availability
- Logistics costs
- Phase of product life cycle.

Product Demand Variability

High volume products with predictable demand are relatively easy to outsource anywhere in the world. However, many sourcing projects have a mix of products with low-to-medium volumes and some demand variability. Often it is assumed that the economies of scale in component sourcing associated with high runners will drive cost savings in the variable demand product, or that the size of the total project will drive some level of price discounting at the contractor. This isn't always the case. Lower volumes have more line changeovers and don't always have component commonality with the higher volume product. If the contractor doesn't value lower volume, higher mix product there may be late deliveries or expedited shipping charges. There may also be quality issues associated with product configuration errors. Yet, segregating high volume and lower volume, less predictable production may result in higher pricing for the less attractive part of the mix. That said, countries such as Mexico, which now compete on service as well as price offer both lower labor cost and logistics simplicity for variable demand product. This can provide the best option for accessing a lower cost labor market while maintaining logistics simplicity. If a mix of product is being supported, the border region with the U.S. may offer the most logistics flexibility.

Regulatory or Content Requirements in the End Market

Highly regulated products such as medical devices or military/aerospace products often have very rigid specifications for custom parts, processes, quality registrations and/or export licensing. In some cases,

this limits the contract manufacturer build site or approved vendor list geographically. For example, one customer re-shored a product built in India because of a requirement to calibrate the product's thermostat in the U.S. When the cost savings of manufacturing in India was measured against the costs of using one source for manufacturing domestically, the U.S. build was cheaper. It should be noted Mexico's manufacturing base now supports regulatory complexity fairly well. It has a growing aerospace industry and is also strong in medical product manufacturing.

Inventory Taxation Policies

Inventory taxation policies on imported raw materials can vary widely by country, as can the cost of warehousing. Import quotas can drive requirements for customers to agree to reconciliation of excess inventory on a more frequent basis than typically done in the U.S.

Finished goods inventory taxation is also popular in many countries, including parts of the U.S. Companies trying to smooth variations in demand by requiring remote suppliers to provide finished goods kanban via a warehouse near the end market, may encounter added taxes on longer term inventory storage. Potential inventory taxation costs should be evaluated carefully if a dedicated warehouse kanban is part of the strategy.

Differences in Regional Component Pricing/Availability

While there is a perception that material costs are lower in Asia, that isn't always true. At a regional level, material pricing advantages or lack thereof can be heavily influenced by unit volumes and end application. Products with lower volumes or higher mix may see little or no materials cost discounting in emerging or established markets. The higher productivity/service focus of a mature market may represent the most competitive cost when total cost is evaluated.

The constraints on the materials market of the last few years also highlighted another issue that may vary by region: component availability. When a part goes on allocation, there may be variances in regional availability. The effect this time was more pronounced because materials constraints included classes of parts that normally didn't go on allocation. Moving production from a contract manufacturer in one region to a contract manufacturer in a different region may have the unintended consequence of extending lead-times on components that were more readily available in the old region.

Logistics Costs

In evaluating logistics costs, OEMs should consider not only the quoted landed cost, but the likely impact of schedule variation and the added cost of shipment to the end market. In lower volume, longer life product, the benefits of using a single source for manufacturing, fulfillment and repair depot should be

analyzed. In some cases, that analysis may show cost benefits for regions with higher labor costs coupled with high productivity and service cultures.

Phase of Product Lifecycle

As OEMs have reduced internal resources, EMS providers have been expected to add more support to the front end of the product lifecycle. Suppliers in mature labor markets often address this issue far better than those in lower cost labor markets. Communications issues driven by differences in language or perception can add cost. OEM engineering personnel may be unwilling to accept heavy travel schedules, added work hours to address time differences or short-term assignments as a remote source inspector. Frequent engineering change orders (ECOs) may drive expedited shipments or rework at the end market. There can also be risk of intellectual property (IP) theft in areas with weak IP protection. The costs associated with any of these potential issues may be much higher than the cost savings in lower cost markets. Consequently, immature product may be best sourced closer to the site managing product development. Similarly, at the end of a product lifecycle, a facility in a mature market close to the end market may be best suited for managing end-of-life production support, given the lower volumes and challenging material obsolescence issues that can occur at that point in the life cycle.

Regional Advantages and Tradeoffs

The fact that regions evolve over time should translate to adaptations in sourcing strategy rather than mass migration from one popular country to another. Selecting a contractor able to support flexibility in this area can minimize transfer costs while providing options as sourcing requirements change. SigmaTron's network of facilities in North America and Asia offer this type of advantage. The following overview looks at specific advantages and tradeoffs in regions where SigmaTron has facilities.

North America advantages include:

- Wide variety of supply base options in the US, Canada and Mexico that are geographically convenient to OEMs based in the region
- Strong focus on productivity and continuous improvement
- U.S. manufacturing supports "Made in America" branding
- The U.S., Mexico and Canada easily support product development and new product introduction (NPI)
- Mexico supports both high volume and high mix, variable demand
- There are minimal corruption or safety issues in the U.S. and Canada
- English is widely spoken at the engineering and management level throughout North America

- Mexico provides access to low cost labor and border-based manufacturing facilities offer logistics simplicity
- Mexico's maquiladora export program can provide a tariff mitigation option for parts shipped from China for products manufactured in Mexico
- IP protection is strong.

North America disadvantages include:

- The U.S. and Canada are mature economies with concomitant higher costs
- While Mexico's border regions have efficient logistics, transportation from the interior can be inefficient
- While Mexico's drug cartel war has calmed down significantly from its peak, there are still safety issues in some cities
- Mexico's government entities can be inefficient and some corruption exists
- The workload created for U.S. Customs & Border Patrol (CBP) by the migrant influx from Central America has created sporadic commercial truck processing delays and temporary border shutdowns at some ports
- The peso has seen significant devaluation and that has both good and bad impact on costs.

China advantages include:

- There is a well-trained workforce and large supply chain infrastructure
- Manufacturing in China is the most cost effective way to support product sold into China
- There is increasing focus on improved productivity and continuous improvement which helps to balance cost increases.

China disadvantages include:

- Costs are increasing
- There is unrest in Hong Kong which adds uncertainty to policy stability and attractiveness of the region
- Labor turnover can be high in the most popular manufacturing zones
- China's government entities can be inefficient
- English fluency varies widely
- While there is movement in reaching a trade agreement that may end U.S.-China tariffs, the timeframe to total tariff elimination appears to be lengthy
- IP protection can be weak.

Southeast Asia advantages include:

- Emerging, established and mature labor markets to support the supply chain
- Suppliers are willing to do high mix, lower volume production, as well as high volume production
- Engineering, management and technical staff in many countries are fluent in English
- Established business model for contract manufacturing, skilled workforce and technical support infrastructure that supports continuous improvement efforts.

Southeast Asia disadvantages include:

- Some countries are seeing wage and cost-of-living increases
- Corruption and government inefficiency does exist
- Emerging markets may have fewer English speakers.

Consideration in Selecting the Right Contractor

All regions offer broad choices in contract manufacturers. However, just as evolving labor markets have tradeoffs, so do suppliers. Indigenous suppliers may offer the lowest costs, but may be less flexible on schedule changes or less focused on service. The need to obtain customer approval for approved vendor list (AVL) or process changes is not always well understood by contractors predominately focused on consumer product manufacturing. Contractor business models in markets that are maturing may vary widely. Some may still focus on high volume work, while others may be optimizing to support higher mix or variable demand. In maturing markets, look for contractors who are mitigating labor cost increases with efficiency improvements.

Questions to ask during the sourcing evaluation include:

- Are there projects of similar size and scope being built at this facility?
- Do the contractor's systems give you remote visibility into project status?
- Does the contractor's team have sufficient engineering expertise to support the needs of your project?
- How closely does this project match the contractor's preferred business model?
- Does the contractor's facility footprint align with the likely requirements of the project over time?
- What current initiatives does the contractor have in place to mitigate market challenges or capitalize on market opportunities?
- Should the proposed scope of work be broadened to include post-manufacturing support?
- How well does your team seem to communicate with the contractor's team?

- Does the contractor appear to have good customs expertise either internally or through its broker network?
- How robust is the contractor's transfer of work process?
- What recommendations does the contractor offer to lower overall project cost?
- Does the contractor appear to have a clear understanding of government policies in the countries where it is located and a strong contact network within relevant government agencies?
- Does the contractor's team appear to fully understand any regulatory constraints associated with your product?
- Do quality systems and service capabilities align with the requirements of your project?

Conclusion

In high volume manufacturing, lower cost regions can save money. However, in low-to-medium volume manufacturing, the cost savings in lower cost regions may be marginal. Labor content, demand variability, product weight, proximity to end market, regulatory factors and product maturity all impact the equation. Selecting a contractor with a network of facilities and systems for good production status visibility provides the fullest range of options in longer term cost reduction.

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