**Chocolate bars and population shifts: How Hershey's supply chain is adjusting to changing demographics**

**CASE STUDY**

Read the case study and determine the following:

* Challenge(s)
* Solution(s)
* Result(s)

As a Supply Chain Manager for Hershey, what other solutions might you recommend to management?

As a member of tomorrow’s worker and customer, what recommendations would you make to Hershey in the United States?



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By John J. Coyle, Jason Reiman and Kusumal Ruamsook | From the [Quarter 3 2018](https://www.supplychainquarterly.com/archives/2018/03/) issue of Supply Chain Quarterly

***Tomorrow's workers and customers will look a lot different than yesterdays. For the most part, they will be older, more urban, and more diverse. Supply chains will need to adapt to these changes appropriately. Here's how one global candy company is doing just that*.**

The study of demographics for business-related decisions is not a new approach. Some supply chain managers, however, may be of the opinion that such information is more relevant for economists, marketers, and government officials. That conclusion would be a mistake. According to PwC's 17th Annual Global CEO Survey, 69 percent of chief executive officers agree that the economic variable that will transform business the most over the next five years is demographic shifts.[1](https://www.supplychainquarterly.com/topics/Strategy/20181102-chocolate-bars-and-population-shifts--how-hershey---s-supply-chain-is-adjusting-to-changing-demographics/%22%20%5Cl%20%22fn1)

The 21st century has seen the development of several key demographic shifts that will have profound impacts on both the demand and supply dynamics of supply chain management. For supply chain managers, a comprehensive understanding of global demographic forces will provide important insights for understanding the business landscape of tomorrow, which is the key to strategizing and preparing for the challenges and opportunities ahead. In this article, we summarize some of the biggest global demographic shifts that will have a significant impact on supply chain management. We then look at Hershey Company's experiences opening its newest manufacturing facility in Johor, Malaysia, as a real-world illustration of how companies can use demographic information to shape key supply chain decisions.

**Three demographic shifts**

Demographic forces are complex, comprised of multifaceted and interrelated elements. To help make sense of this complexity, we have categorized the key global demographic shifts into three interconnected dimensions as depicted in Figure The following insights are based on a literature review study by the Center for Supply Chain Research at Penn State's Smeal College of Business as well as our extensive professional experiences in global supply chain management.

The three major shifts in global demographics include:

1. a shift in the magnitude of the population

2. a shift in structural elements of the population, including age, socioeconomic makeup, and religion

3. a shift in where people live

These three key global demographic shifts will affect both the supply and demand aspects of supply chain management. On the supply side, these demographic shifts will shape supply chain workforce availability, skills, and work culture. On the demand side, companies will need to mold their economic growth plans and consumer profiles to fit the demographic trends. These plans and profiles will, in turn, affect supply chain strategies for who and what to serve as well as how to do so profitably.

**A declining growth rate**

Although the world's population is expected to continue growing until the end of the 21st century, the growth rate is expected to decrease. Currently, the global population, which was approximately 7.6 billion as of mid-2017, is growing by 1.1 percent per year.

The magnitude of the world's population growth is highly dependent on fertility rates. In recent years, fertility has declined in virtually all regions of the world. Global fertility is projected to fall from slightly over 2.5 births per woman in 2010-2015 to around 2.4 in 2025-2030 and continue to decline to 2.0 in 2095-2100.

It is important to note, however, that there are large variations in fertility levels, and thus population growth rates vary across countries and regions. Less developed countries continue to have a relatively high level of fertility. For some perspective, in 2010-2015 Africa had a fertility rate of 4.7 live births per woman, compared to less than 2.0 in Europe and North America during the same time period. The top countries with low fertility rates are China, the United States, Brazil, the Russian Federation, Japan, and Vietnam.[2](https://www.supplychainquarterly.com/topics/Strategy/20181102-chocolate-bars-and-population-shifts--how-hershey---s-supply-chain-is-adjusting-to-changing-demographics/%22%20%5Cl%20%22fn2)

Historically, the majority of the world's population resided in Asia (60 percent), followed by Africa (17 percent), Europe (10 percent), and Latin America and the Caribbean (9 percent). Northern America and Oceania have made up the remaining 6 percent. However, as a result of the above global demographic shifts, Africa will experience an ever-increasing share of the world's population in the future as depicted in Figure 2. The United Nations (UN) projects that more than half of the anticipated growth in global population between now and 2050 would occur in Africa (1.3 billion), with Asia (750 million) as the second largest growth contributor. Beyond 2050, Africa will be the main contributor to global population growth, as it is estimated that it will be home to about 40 percent of the global population by 2100. The top five countries in terms of their expected contribution to total growth are India, Nigeria, Democratic Republic of the Congo, Pakistan, and Ethiopia, respectively.

**Changing socioeconomic makeup**

We are also seeing some major shifts in the socioeconomic composition of the global population. The age distribution of the population is changing, as is the religious makeup. Economically, we are seeing a redistribution of the middle class to more parts of the globe.

*Age structure* While fertility has declined, the average lifespan around the world has increased. Globally, life expectancy at birth rose by 3.6 years between 2000-2005 and 2010-2015, from 67.2 to 70.8 years. It is projected that life expectancy at birth will rise to 77 years in 2045-2050. The convergence of declining fertility and rising life expectancy has led to a "population aging" phenomenon throughout the world. Overall, the worldwide median age has been rising steadily since 1970 and should exceed 30 years by 2020. This upward trend is predicted to reach about 42 years in 2100. Two notable exceptions to this greying trend are Africa and South Central Asia where fertility is still high and median ages are projected to remain under 30 years through 2020 (Africa at 19.8 years and South Central Asia at 27.6 years).[3](https://www.supplychainquarterly.com/topics/Strategy/20181102-chocolate-bars-and-population-shifts--how-hershey---s-supply-chain-is-adjusting-to-changing-demographics/%22%20%5Cl%20%22fn3)

Another manifestation of this demographic phenomenon is the growing share of the population that is older versus younger age groups. Projections by the U.S. Census Bureau (USCB) and the UN both point to an increasing number of countries with "post-mature" age structures, expanding from only Japan and Germany today to countries in Eastern, Central, and Southern Europe, and much of East Asia.[4](https://www.supplychainquarterly.com/topics/Strategy/20181102-chocolate-bars-and-population-shifts--how-hershey---s-supply-chain-is-adjusting-to-changing-demographics/%22%20%5Cl%20%22fn4) As shown in Figure 3, the share of the world's population aged 60 and older has grown rapidly from 10 percent at the turn of the century to a projected 21 percent by 2050 and 28 percent by 2100. In contrast, the share of the population that is young (under 15 years) and working age (15-59 years) will decline during the same time period—the former dropping from 30 percent in 2000 to 18 percent in 2100, and the latter from 60 percent to 54 percent.

*Religious Structure:* The world's religious makeup has also undergone change and will look much different by 2050 than it does today.[5](https://www.supplychainquarterly.com/topics/Strategy/20181102-chocolate-bars-and-population-shifts--how-hershey---s-supply-chain-is-adjusting-to-changing-demographics/%22%20%5Cl%20%22fn5) According to the Pew Research Center, Christians are currently the largest religious group, but Muslims are increasing more rapidly because of their greater longevity and birth rates. It is estimated that by 2050 the two groups will be about equal in size, but the distribution among countries will vary. Meanwhile, driven in large part by the millennials, the number of adults who do not identify with any organized religion has grown, giving rise to the "none" or "unaffiliated" group, which is now the second-largest religious group in 48 percent of the world's nations.[6](https://www.supplychainquarterly.com/topics/Strategy/20181102-chocolate-bars-and-population-shifts--how-hershey---s-supply-chain-is-adjusting-to-changing-demographics/%22%20%5Cl%20%22fn6)

*Socioeconomic structure:*Major shifts in the geographic distribution of middle-class markets are also happening. The global middle class, which had been found primarily in the Western world, is now shifting to emerging Asian economies. Specifically, the growth of the middle class in Europe and North America is slowing, while it is rising rapidly in Asia both in terms of the number of people and spending as depicted in Figure 4.

**The migration effect**

When doing long-term planning, it is important to realize that populations do not necessarily stay still. International and domestic migration can have a profound effect on where potential workers and customers will be located in the future.

*International migration:*The growth in international migration is one of the most pervasive demographic trends of the last two decades. International migration has been driven primarily by economic opportunities. The Pew Research Center's analysis of UN data shows that 244 million people lived outside their birth countries in 2015, three times the rate found in 1960. About 90 percent of these migrants have crossed borders voluntarily as working-age adults attracted by job opportunities in the country of employment.[7](https://www.supplychainquarterly.com/topics/Strategy/20181102-chocolate-bars-and-population-shifts--how-hershey---s-supply-chain-is-adjusting-to-changing-demographics/%22%20%5Cl%20%22fn7)

However, the 21st century is seeing some paradigm shifts in terms of origin-destination flow and growth rate. Major international migration flows at the end of the 19th and early 20th centuries were from Europe to core migration countries like the United States, Canada, and Australia. In the 21st century, the main flows start to reorient from the East to the West, with Europe becoming a major destination for immigrations, rather than an origin, and with an increasing proportion of immigrants now coming from Asia, Africa, Oceania, and Central and South America.[8](https://www.supplychainquarterly.com/topics/Strategy/20181102-chocolate-bars-and-population-shifts--how-hershey---s-supply-chain-is-adjusting-to-changing-demographics/%22%20%5Cl%20%22fn8)

The growth rate of international migration is, however, showing some signs of contraction. After growing in both absolute terms and as a relative share of the global population in each five-year period since 1980-1985, the recent 2010-2015 period shows a decline by both of these measures. This is due in part to increased economic and employment opportunities in emerging countries. The rising anti-immigrant sentiment in some countries has probably also contributed to decreased international migration.[9](https://www.supplychainquarterly.com/topics/Strategy/20181102-chocolate-bars-and-population-shifts--how-hershey---s-supply-chain-is-adjusting-to-changing-demographics/%22%20%5Cl%20%22fn9)

*Domestic migration:*We are increasingly seeing the population shift from living in more rural areas to urban ones. The world's urban population has been rising by an average of 65 million people annually during the past three decades, and it exceeded the rural population for the first time in history in 2007. In 1960, 34 percent of the world's population lived in cities and towns, whereas today 54 percent live in urban communities. Nearly 78 percent of those urban communities are in developed regions.[10](https://www.supplychainquarterly.com/topics/Strategy/20181102-chocolate-bars-and-population-shifts--how-hershey---s-supply-chain-is-adjusting-to-changing-demographics/%22%20%5Cl%20%22fn10)

The pace of rural-to-urban migration is waning in developed regions that are now largely urban, but the urbanization rate (the percentage of the population that resides in an urban setting) in less developed regions is accelerating. By the year 2050, urbanites will increase from being 54 percent to being 66 percent of the world's population, with almost 90 percent of this increase taking place in Asia and Africa.[11](https://www.supplychainquarterly.com/topics/Strategy/20181102-chocolate-bars-and-population-shifts--how-hershey---s-supply-chain-is-adjusting-to-changing-demographics/%22%20%5Cl%20%22fn11) Midsize cities across the emerging world, in particular, will experience the fastest growth during the next two decades.[12](https://www.supplychainquarterly.com/topics/Strategy/20181102-chocolate-bars-and-population-shifts--how-hershey---s-supply-chain-is-adjusting-to-changing-demographics/%22%20%5Cl%20%22fn12) Meanwhile, in developed countries where urbanization has matured, domestic migration will shift from rural-to-urban migration to largely city-to-city migration.[13](https://www.supplychainquarterly.com/topics/Strategy/20181102-chocolate-bars-and-population-shifts--how-hershey---s-supply-chain-is-adjusting-to-changing-demographics/%22%20%5Cl%20%22fn13)

**Supply chain implications**

These demographic shifts will have profound effects on the supply chain, and just as these demographic trends are interconnected, so too will be their effects on the supply chain. In many cases, there will not be a simple one-to-one relationship between trend and impact.

The impacts will be felt on both the supply and demand side of supply chain management. On the supply side, the questions of supply chain workforce availability, skills, and work culture will be fundamentally shaped by these shifts. On the demand side, economic growth and consumer profiles will be molded by the demographic trends, affecting supply chain strategies as to who, what, and how to profitably serve the changing markets. The key supply chain implications of the global demographic shifts are discussed below and highlighted in Figure 5.[14](https://www.supplychainquarterly.com/topics/Strategy/20181102-chocolate-bars-and-population-shifts--how-hershey---s-supply-chain-is-adjusting-to-changing-demographics/%22%20%5Cl%20%22fn14)

* **Shrinking overall workforce availability.**As the global population declines and gets older, the number of available workers will drop. Some actions that companies may take to accommodate this change include implementing automation; crowdsourcing labor; and increasing workforce diversity, for example by hiring more women and retirees. Furthermore, if migration continues to decline, companies will no longer be able to depend on worker migration as a way to increase labor availability. Instead they will need to locate their operations in local markets with demographic advantages.
* **Need to plan successors of older workers.**As the population gets older, particularly in developed economies, the number of middle- and top-level managers approaching retirement age will also grow. Companies need to devise a leadership succession plan and create a strong supply chain talent pipeline.
* **Larger share of the workforce in emerging markets.**Not only will the workforce shrink but its geographic locations are changing, with a larger share of its existing in emerging markets, notably Africa and South-Central Asia. Historically, these regions do not have as many workers with skills in supply chain management. Thus, supply chain managers seeking workforce in emerging markets must take into consideration the types of education and training programs required to improve the skills of these growing pools of workers.
* **Need to accommodate changing workforce culture and structure.**An inclusive and diverse work environment will grow increasingly important, especially as millennials, who in general value diversity, enter the global workforce. Additionally, the culture of the available workforce in core migration destination regions or countries, like Europe and the United States, may change dramatically. Companies will need to recognize that an increasing proportion of the labor pool in those areas will be made up of immigrants from Asia, Africa, Oceania, and Central and South America. Immigrants bring with them different cultural backgrounds, religious beliefs, and languages, among other factors. It is important to recognize and accommodate these changes when creating teams and planning operations schedules. For example, companies may need to schedule prayer breaks for Muslim employees.
* **Need to change demand growth strategies.**As the population in general and the middle class in particular increases in emerging markets, these areas will become more strategically important to companies. Furthermore, the shrinking global population trend means it will be harder for companies to connect their own growth to a growing population of consumers. Instead companies will need to focus on increasing per capita spending. This will require a more granular understanding of consumer profiles, such as who they are, what they want, and what they are willing to purchase. Supply chain decisions such as network design (for example, where to locate production facilities and distribution centers), sales and operations planning (what and when to produce products), and logistics services (what attributes to focus on: cost, speed, and quality) must be made to best serve the consumers profiled.
* **Changing consumer base.** Companies will need to adapt their supply chain strategies to new key consumer groups. For example, as the population of consumers in developed countries grows older, consumption behaviors will change. Companies will need to ask themselves questions such as: What will this new consumer group value? Will product size have to change? Will we need to adapt our products or services to accommodate the health of the consumer? Companies will also need to create an effective urban supply chain in emerging countries that are seeing a growth in young, urban, middle-class consumers. Direct-to-consumer logistics operations may be key here. For companies that supply faith-based products or services, shifting religious demographics would suggest changes in potential market size and opportunities for growth.

**The tale of Hershey's Johor plant**

To gain a sense of how supply chain executives could apply these demographic insights in a supply chain context, let's look at how The Hershey Company used demographic information to help it respond to growth in international sales.

A leading global confectionery company, The Hershey Company operates with about 80 brands in about 80 countries today. Hershey's global footprint has been expanding, and international sales represented approximately 14 percent of their net sales in 2017. The company views international sales as important for future growth and profitability.

Although developed markets remain the most prominent consumers of candy and chocolate, markets in the United States, Europe, Japan, and Australia have matured and the growth rate is slowing.[15](https://www.supplychainquarterly.com/topics/Strategy/20181102-chocolate-bars-and-population-shifts--how-hershey---s-supply-chain-is-adjusting-to-changing-demographics/%22%20%5Cl%20%22fn15) For this reason, new markets will be imperative for future growth. Based on an analysis of global demographics, Hershey found that major global consumption growth in the next 15 to 20 years will come from city-dwelling middle-class consumers in emerging markets. The increasing disposable income in these markets is fueling growth in demand for confectionery products. Many of the company's key growth markets are in Asia and the Middle East, notably China, India, Saudi Arabia, and the United Arab Emirates.[16](https://www.supplychainquarterly.com/topics/Strategy/20181102-chocolate-bars-and-population-shifts--how-hershey---s-supply-chain-is-adjusting-to-changing-demographics/%22%20%5Cl%20%22fn16)

A common supply chain practice in the global confectionery industry is to serve the majority of demand from a production facility located in the same region.[17](https://www.supplychainquarterly.com/topics/Strategy/20181102-chocolate-bars-and-population-shifts--how-hershey---s-supply-chain-is-adjusting-to-changing-demographics/%22%20%5Cl%20%22fn17) To satisfy growing demand in Asian markets, Hershey decided that it needed to expand production capacity in the region by building a new plant.

The opening of another plant had some inherent risks, which necessitated a careful analysis of demographic factors, the supply chain infrastructure, and relationships with supply chain partners that would impact not only manufacturing but also the market opportunities for its product line. Given the importance of the decision, Hershey established a six-year timeline, starting in 2010, to fully implement the plan.

Hershey identified seven countries in Asia as potential locations for the new plant, including Indonesia, Malaysia, Philippines, Singapore, Thailand, Vietnam, and China. To assess which location would be best, the company used a decision framework with weighted factors for considerations such as reliability of supply and multiple aspects of cost, including operating and logistics costs. The framework also took into consideration labor capability, supply chain infrastructure, socio-political factors, business fit, and commercial viability.

Factors related to demographics permeated the analysis. Johor, Malaysia, was selected as the location for the new plant for multiple reasons, including advantageous demographics and supply chain infrastructure. The former included an educated, young, and productive work force and comprehensive vocational and industrial training. The latter included a strategic location for important market areas, a central location for export, and close proximity to key ingredient sources like cocoa liquor and sugar.

The challenge for Hershey was not only to ensure that production capabilities were developed sufficiently close to its most important new markets in Asia and the Middle East but also to learn to operate as effectively as possible in the new demographic environment.

One notable and unique demographic factor that influenced Hershey's facility design and operation planning was religion. While Malaysia is a multi-religious country and its constitution guarantees religious freedom, more than 60 percent of the population is Muslim. As a result, Hershey needed to develop a better understanding and awareness of Islamic religious beliefs and practices and accommodate them in the design of both the physical plant and its operations. Specific actions included:

* A facility design that included prayer rooms for employees.
* Celebrating, in a meaningful way, the religious holidays of the majority of the population. This could be a simple communication or "well wishing" to a celebration lunch. Employees are also eligible for time off or limited operations during the key holidays,
* Assuring continuity of operations while also understanding and celebrating these religious holidays. In the early stage when the plant was going through ramp up of the facility, this was accomplished more easily. As the plant grows, the diversity of the workforce will allow for full or limited crewing on less celebrated holidays. The plant would still need to schedule around national holidays.

As the company set up the plant, it also recognized that the population of Malaysia was young and their work experience in food manufacturing and technical skills were, in general, limited. To develop a capable workforce at the Johor plant, Hershey brought in experienced people from elsewhere in its networks to assist in training and developing the new staff. Experienced, U.S.-based employees who were knowledgeable about Hershey's plant operations played a key role in training and passing their knowledge to a new, younger generation of employees. In addition, many of the training personnel were from European equipment suppliers that provide on-site support.

As a result, language was another demographic that Hershey needed to consider as it planned how the plant in Johor, Malaysia, would operate. Many of the employees were bilingual, and some were fluent in three to four languages, creating an interesting communications dynamic within the plant. Team meetings are a key part of Hershey's lean manufacturing culture, which strives to reduce nonvalue-added activities and their associated costs.

These meetings were critical as the plant started up new production lines and received support from across the broader Hershey organization as well as from suppliers. The meetings allow the team to discuss current performance metrics and key initiatives as well as plan activities for the coming day. During these meetings, the team highlights opportunities and assigns the appropriate resources to be accountable for implementing solutions. The meeting is a clear communication tool to ensure that all employees understand the current priorities.

Because the plant is a multilingual environment, the language dynamics at these meetings vary depending on participants. At the factory-floor level, the majority of the communications happen in Malay, as most of the team members are local to Malaysia. Daily meetings at the business unit level, however, occur in a mixture of Malay and English, as the diverse leadership team from across Asia needs to communicate with other functions, mostly Malaysian locals, across the plant, including planning and technical services. Â

In the process of starting up the new Johor plant, Hershey also designed and implemented computer-based training programs in both Malay and English to introduce the new employees to the working culture of Hershey and the key capabilities for their success and advancement. The training focused on how to make Hershey products as well as food safety, quality, and worker safety. The training program was rigorous with key milestones to measure success. Hershey was delighted with the progress. A senior-level executive of Hershey noted that this group of employees were among the most engaged that he had observed in his 20-plus years with Hershey.

**Taking the long view**

As Hershey's experiences at its Johor plant illustrate, understanding both global and local demographics are important for the successful implementation of a company's supply chain strategy. Supply chain executives would do well to follow Hershey's lead and have a basic understanding of the implications of key demographic trends. It is important to note that the influences of these demographic shifts will not be short-lived. Therefore, understanding the influence of these emerging demographic trends on supply chains should be an essential first step to any supply chain strategic plan.

This is not to say that the people factor alone is sufficient for supply chain success, but rather that it is a necessary and important ingredient. After all, you need people to effectuate the technology, processes, and assets needed for supply chain success. In the end, it is no longer a matter of whether companies should incorporate demographics into their supply chain strategies, but rather *how*they are going to do so. The time to figure out how to put in place a future-fit, demographically compatible supply chain is now.

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(Figures and Notes are available at <https://www.supplychainquarterly.com/topics/Strategy/20181102-chocolate-bars-and-population-shifts--how-hershey---s-supply-chain-is-adjusting-to-changing-demographics/>)