

## Eating Three Times a Day

Prof. Douglas A. Hensler, Ph.D., P.E.

*Ex-Deming Professor & Dean, W. Frank Barton School of Business, Wichita State U., USA.*

### ABSTRACT

In poor countries, the burgeoning middle-class population, people who eat three times a day<sup>1</sup>, is placing profound worldwide price pressure on food and natural resources. This keynote address examines the implications of the boom in middle-class population on the world economy and innovation. Where not long ago food production was aplenty and the problem was distribution, today growing middle-class demand on food production has prices of food staples such as wheat and corn, and their derivatives, inflating. This follows the trend in the growth of prices of natural resources and durable commodities emanating from economic globalization and the building of infrastructure. This keynote address examines the five prices that are in play in the global economy and a brief perspective through the supply chain window. The address also examines implications of the middle-class boom and the additional importance this places on innovation, particularly in three areas of economic structure.

**Keywords:** Commodities, globalization, innovation, middle-class, supply chain, sustainability

*“To benefit from globalization, whether as an individual, a community, a country, or a business, there are two things you must do. First, you have to accept and embrace change. Second, you have to innovate.”*

— W. James McNerney, Jr.

Chairman, President and CEO, the Boeing Company

### 1.0 Introduction

The U.S. National Council of Applied Economic Research reports that less than 10 percent of India's population was middle-class in 1985. Today, economic growth in India extrapolates to the middle-class representing half of the Indian population sometime between 2020 and 2040 (1). Similar demographic changes are occurring in China, Indonesia, Malaysia, Vietnam, Philippines, and Brazil. By 2020, the population of the world is expected to grow by another 1 billion people (2). During the same period the population of the middle-class will grow by 1.8 billion people (3).

The boom in the middle-class across the globe means that demand for commodity goods and specialty goods has already started increasing and will continue to do so. For some time, global economic growth has driven price impacts on oil and its derivatives such as gasoline and synthetic fibers, wheat, corn, cement, steel, aluminum, and so on. For example, Italians are being encouraged to boycott pasta because of price increases. In the fall of 2007, the BBC reported, “The price for durum flour, the main ingredient for Italian pasta, has risen from 0.26 euro per kg (£0.18) to 0.45 euro per kg in the last two months.” (4).

In another example, reported on February 1, 2007, “Tens of thousands of people have marched through Mexico City in a protest against the rising price of tortillas. The price of the flat corn bread, the main source of calories for many poor Mexicans, recently rose by over 400%.” (5). Price pressure on corn emanates from increased consumption demand by middle-class and poor people, along with the push to produce biofuels from corn.

<sup>1</sup> The author first heard this characterization in a speech by Moises Naim, Editor-in-chief of Foreign Policy magazine, on February 28, 2008.

The global growth of the middle-class and its continuance presages continuing pressure on goods and services prices. However, there are other prices to consider, as addressed in the next section. In the future, will these populations continue to eat three times a day?

## 2.0 Five Important Prices

The simple law of supply and demand dictates that goods and services prices are integral to the flow of exchange. In a commodity market, price results from the intersection of supply and demand. In a monopoly market, the output price is set by the producer. In a monopsony market, the input price is set by the producer. Between commodity markets and monopoly/monopsony markets lay the majority of markets. Expanding this analysis yields four additional pricing phenomena beyond that for normal goods of long run competitive equilibrium, commodities. These prices impact the middle-class.

### 2.1 Currency (Exchange Rates)

Recent changes in exchange rates highlight the impact of the metric of trade, currencies and the price of currency. Just six years ago, the U.S. dollar cost 1.14 Euros. Today the U.S. dollar costs 0.65 Euro, a 57% reduction in the currency rate. The effect of this U.S. dollar weakening is to very significantly reduce the international purchasing power of the dollar and very significantly increase the purchasing power of the Euro. Other currencies have strengthened against the dollar, including the Australian dollar from nearly AUS\$2/US\$ in 2002 to Aus\$1.07 today, the Canadian dollar from CA\$1.60/US\$ to CA\$1/US\$ today, the Thai baht from TB44/US\$ to TB30/US\$ today and the Malaysian Ringgit from the pegged MR3.8/US\$ to MR3.2/US\$ today after being unpegged in July 2005. The strengthening relative to the U.S. dollar of the Australian, Canadian, Thai, and Malaysian currencies over this period is 47%, 38%, 35%, and 16%, respectively.<sup>2</sup>

The effect of exchange rate changes is to increase relative goods and services prices in weakening currencies and drive decrease relative goods and services prices in strengthening currencies. For example, travel in Europe for some U.S. citizens has now become prohibitive for many Americans. Correspondingly, in the weeks preceding Christmas 2007 Europeans were found in large numbers shopping in major U.S. markets such as New York, Chicago, and San Francisco.

### 2.2 Money (Interest Rates)

The price of money is the intertemporal cost to hold or employ that money, interest rates. Interest rates consist of the real rate of growth, inflation, and a risk premium that in equilibrium reflects the risk exposure of the money provider. The real rate of growth reflects the gross domestic product growth in an economy. If the economy is not growing, it is stagnate. If the economy is shrinking, recession, possibly depression, is taking place. Normally recession and depression would be accompanied by steadiness or deflation in prices. If economic stagnancy and inflation characterize the economy, the economy is experiencing stagflation. Such was the case in the late 1970s in the U.S. and this author believes such a case is a strong potential for the near future in the U.S.

When the risk exposure is ignored, like the U.S. real estate boom from 2003 to 2006, interest rates do not fully reflect the risk exposure of the money provider. The result of this “cheaper” money is to inflate the

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<sup>2</sup> The Malaysian currency may be grossed up by two times since the Ringgit was pegged to the U.S. dollar until July 2005 and the floating period is roughly half that of the six year period from 2002 to 2008.

prices of goods for which the money is provided. In the case of real estate, housing prices and all that goes into housing saw significant increases over this period. In some locations, houses are now half the price they were in 2005.

### **2.3 Commodities**

Commodities are goods and services for which there are many suppliers and many consumers. Homogeneity characterizes commodity goods and services; for example, cement is common in its consistency, plywood and oriented strand board are the same regardless of supplier, steel the same, etc. As noted earlier, supply and demand determines commodity prices. If the demand curve shifts to the right, the price will rise provided the supply curve is upward sloping and quantity sold will increase provided the supply curve is not vertical.

Over the past fifteen years with the sharp increase in economic development in countries like China, India, and Vietnam the pressure on commodity prices has also sharply increased. Part of this is one-time demand as physical infrastructure development has taken place. This has placed unprecedented pressure on natural resources, which once removed from the ground are spent and entered into the developed side of exchange. Recycling of durables is a durables secondary market.

The increase in prices has been driven by the predictable desire of those providing the labor for growth to enjoy a better life (6). Demand pressure on commodity prices will continue due to general population increase and to the increase in the middle-class populations in developing countries. The latter group definitely wants to live better than previously and they want to eat three times a day. The pressure on natural resource prices and food prices will not be abated in the foreseeable future.

### **2.4 Communication and Information Processes**

In the meantime, communication and information processes prices have and will continue to decrease. However, these prices do not reflect the total cost of communication and information processing. With the unprecedented amount of information, the unprecedented production of information and the unprecedented access to information, primarily via the Internet, a great deal of misinformation and nonfact-based data exist. As a result, while information is readily available and inexpensive, deciphering costs have increased significantly.

Coupled with this has been the explosion of product and service choices. For example, at one time in the U.S. there were essentially three choices of automobiles within a given classification. Today, within a classification there are many choices and the point of purchase includes dealerships, the Internet, brokers, and individuals. Even in commodities the selection process can be daunting given the marketing campaigns and product differentiation attempts, coupled with service differentiation.

### **2.5 Risk (Insurance)**

The price of risk, insurance premiums, is also increasing. The failure to recognize risk, as was the case in the recent U.S. mortgage market, compounds the price of risk. Some argue that global warming is having a profound effect on risk abatement costs.

In food growing markets, the cost of insuring crops in light of oscillating weather conditions is increasing. This, along with population increases, which put added pressure on resources such as water, is generating additional pressure on the price of risk.

Price differentials across markets are causing the redistribution of resources to unintended consumption. For example, in California USA farmers who benefit from advantaged pricing for water are not taking delivery of the water, instead selling the water rights to large cities for prices reaching four times the farmer's cost of water (7). This in turn increases the prices of commodity and noncommodity food items.

### **3.0 The Supply Chain Perspective**

Globalization has enhanced the supply chain perspective of exchange. The supply chain contains three conduits of transference or exchange. First, the product or service represents the core conduit. Second, the information transfer relative to exchange represents the knowledge conduit. Third, the financial transaction represents the completing conduit.

All three transference conduits represent markets required for exchange completion. They also represent varying degrees of transactions costs, some relatively small, some very large. The speed of transactions depends on these transactions costs and reducing transactions costs can be a value-creating exercise.

India has become the service provider to the world by virtue of significantly reduced communications transactions costs. Because of its highly educated middle-class and upper-class, India's place transcends call centers to include medical professionals that read and interpret x-rays, CT scans, and MRI's from around the world.

If the study of supply chains has provided anything to enterprise improvement it has been the understanding of transactions costs and transactions cost mitigation. This is true whether the conduit is for the product/service, information, or financial reconciliation.

### **4.0 Innovation, Globalization, and Middle-Class Pressure on Prices**

In a recent New York Times article, Daniel Basse of Chicago agriculture consultant AgResource Company states, "Everyone wants to eat like an American on this globe. But if they do, we're going to need another two or three globes to grow it all" (8). Perhaps Basse's characterization is an intentional exaggeration; it does present but one alternative. The more accessible alternative is to innovate. Innovation is more accessible than alternative globes for growing food, but more importantly history has proven time and again that humankind innovates, particularly when prices incent innovation. As Plato said, "Necessity is the mother of invention."

In the present case, with higher food prices innovation will be incented in three areas. First, the productivity of land will be increased. Land heretofore left bare because of the cost of cultivating will become attractive to plant. This will be supported by improved water resources technology, land utilization methods, and waste water and refuse recycling for fertilization purposes. For example, recently the first cattle manure-to-methane facility was put into production in California USA (9).

Second, strong incentives will exist to address the transactions costs of exchange within the food supply chain. Better methods of transportation will evolve and in combination with additional localization of growth the transportation costs will abate. Biospheres may emerge as significant localized production facilities.

Third, “Show me waste and I will show you an unused resource.”<sup>3</sup> Incentives to recycle goods will be stronger than ever. Recycling will transcend individual intrinsic motivation to the economic motivation akin to that already present for aluminum cans and some plastics. Humankind will find new and more efficient ways to reuse materials heretofore discarded. Obsolete durables will be reprocessed into new durables. Food waste products will be reprocessed into biofuels and other carbon-based products.

## 5.0 Conclusion

While there is a near-term challenge to prices of food and resources that will no doubt be painful, the longer term prognosis is optimistic. Humankind has always responded to challenges to its existence in mostly positive ways. Rather than the current state presaging doom and gloom, the present state places the world economy on the threshold of yet another revolution of innovation and invention.

The new period of innovation and invention will be characterized by competition for sure, but it will also be characterized by cooperation. For example, in the U.S. the Laval Water and Energy Technology Incubator at California State University, Fresno brings together water technology companies and academics to understand and invent water production, storage, and recycling methods (10).

In her Serial Endosymbiosis Theory (SET) Lynn Margulis (11) states that biological evolution is driven more by cooperation than by competition. So it will be as humankind progresses. While innovation for competitiveness will continue to be an important facet of the global economy, cooperation will be ever more important as humankind addresses the problems of economic advancement, the environment, and social concerns.

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<sup>3</sup> Author unknown

### Author's Background

**Prof. Douglas Hensler** joined California State University in June 2005 as Dean and Sid Craig Endowed Dean's Chair in the Craig School of Business. For the prior eight years Doug served at the University of Colorado at Boulder as the W. Edwards Deming Distinguished Professor of Management in a joint appointment to the College of Engineering and Applied Science and the Leeds School of Business. At Colorado he also served as Co-Executive Director of the Robert H. and Beverly A. Deming Center for Entrepreneurship. Doug's academic preparation includes a BSE in Aerospace and Mechanical Sciences from Princeton University, an MBA from the University of Portland, and a Ph.D. in Finance from the University of Washington.

Doug is a licensed professional engineer in Quality Engineering in the State of California. His career spans 14 years in the nuclear and aerospace industries and 25 years in academia. He has led production operations with 250 personnel and an R&D group developing state-of-the-art process improvements. He has traveled extensively to over 20 countries, both in industry and in academia, and delivered keynote addresses and presentations at universities, conferences, and companies. His training, consultancy, and executive coaching engagements include American Airlines, CH2M-Hill, Texas Utilities, Sulzer, Louisiana-Pacific Corporation, Micro Motion, FEMA, Sporian Microsystems, the Electricity Generating Authority of Thailand, Weir-Floway, and the Fulfillment Corporation of America.