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**Why Is the Obesity Rate So Low in
Japan and High in the U.S.?
Some Possible Economic Explanations**

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Abstract

More than one billion adults are overweight worldwide, and more than 300 million of them clinically obese, raising the risk of many serious diseases. Only 3.6 percent of Japanese have a body mass index (BMI) over 30, which is the international standard for obesity, whereas 32.0 percent of Americans do. A total of 66.5 percent of Americans have a BMI over 25, making them overweight, but only 24.7 percent of Japanese. This paper examines the reasons Japan has one of the lowest rates of obesity in the world and the United States one of the highest, giving particular attention to underlying economic factors that might be influenced by policy changes. The average person in Japan consumes over 200 fewer calories per day than the average American. Food prices are substantially higher in Japan, but the traditional Japanese dietary habits, although changing, are also healthier. The Japanese are also far more physically active than Americans, but not because they do more planned physical exercise. They walk more as part of their daily lives. They walk more because the cost of driving an automobile is far higher in Japan, whereas public transportation is typically very convenient, but normally requires more walking than the use of a car. In terms of policy solutions, economic incentives could be structured to encourage Americans to drive less and use public transportation more, which would typically also mean walking more.

JEL Classification: D 12 ; I 11

Keywords: obesity, food consumption, food prices, physical activity, walking, automobile costs

Working Paper 06-02
The Food Industry Center
University of Minnesota

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TABLE OF CONTENTS

Introduction.....	Page 5
Food Consumption, Prices and Dietary Tradition.....	Page 8
<i>Food Consumption</i>	Page 9
<i>Prices</i>	Page 9
Physical Activity and the Cost of Inactivity.....	Page 13
<i>Walking</i>	Page 14
<i>Costs of Automobile Use and Public Transportation</i>	Page 16
Conclusions.....	Page 19
References.....	Page 23

TABLES

Table 1.....	Page 26
Table 2.....	Page 26

Why Is the Obesity Rate So Low in Japan and High in the U.S.? Some Possible Economic Explanations

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Introduction

According to the World Health Organization (WHO, 2006), over one billion adults are overweight worldwide, with more than 300 million of them being clinically obese. The WHO measure of overweight is a Body Mass Index (BMI) over 25 and a BMI over 30 is considered obese. BMI is determined by dividing a person's weight in kilograms by their height in meters squared. The number of overweight and obese people in the world now exceeds the estimate of those who are chronically hungry (Runge et al., 2003). Overweight and obesity are not only a problem in the developed countries, but are increasing in developing countries, at the same time that chronic hunger remains a problem in many. The prevalence of obesity has risen three-fold or more since 1980 in many countries such as the United States, the United Kingdom, and Australia and other nations in Eastern Europe, the Middle East, and the Pacific Islands (WHO, 2006).

Obesity and overweight are associated with an increased risk of several chronic diseases and premature death, plus significant increases in health care costs. In particular, the incidence of type 2 diabetes, cardiovascular disease, hypertension and stroke, muscular skeletal problems, such as osteoarthritis, and many forms of cancer increase with overweight and obesity (WHO,

2006). Ninety percent of people with type 2 diabetes are obese or overweight, with type two accounting for 85 percent of all diabetes. A higher BMI raises the risk of cancer of the breast, colon, gallbladder, kidney, and prostate (WHO, 2006). The increase in health care costs due to obesity-related diseases was estimated to be \$61 billion in the United States in 2000, with another \$56 billion in indirect economic costs from missed work due to illness and foregone earnings from premature death (Culter, Glaeser, and Sharpiro, 2003).

A comparison of obesity in the Japan and the United States is especially relevant, because Japan has one of the lowest rates and the United States one of the highest rates of obesity in the world. Only 3.6 percent of Japanese age 15 and over had a BMI over 30 in 2002, according to *The National Nutrition Survey in Japan, 2002* (Ministry of Health, Labor and Welfare, 2002). These data were collected in public health centers in Japan by medical teams and not simply self-reported in interviews. The number of Japanese who weigh too much for optimum health is growing as virtually everywhere, though.

Although BMI provides a convenient measure of obesity, the distribution of body fat is important with the highest risks of mortality and morbidity linked to excessive abdominal fat. Studies have found that Asians tend to have more abdominal fat at lower BMI levels (International Obesity Task Force, 2006). With this factor in mind, the Japanese government decided to use a BMI over 25 to define obesity, in which case 24.7 percent of Japanese age 15 and over were obese in 2002. Over 30 percent of Japanese men ages 30-69 had a BMI over 25 (Ministry of Health, Labor, and Welfare, 2002). At the same time, an increasing number of young Japanese women are actually severely underweight. Twenty-six percent of women ages

20-29 had a BMI less than 18.5, which is a level associated with severe malnutrition in poor countries. In Japan, these young women consider it stylish.

In contrast, 32.0 percent of Americans age 20 and over were obese (BMI>30) and a total of 66.5 percent were either overweight (BMI>25) or obese in 2003-2004, some two-thirds of the adult population, based on the National Health and Nutrition Examination Survey (NHANES), (NCHS 2006a). NHANES included a medical exam in which people's heights and weights were directly measured. It should not be surprising that the rates based on exams were considerably higher than those from the National Health Interview Survey, 2003, of 23 percent for obesity and 58.7 percent for overweight and obesity combined, which were based on self-reported heights and weights from telephone interview (NCHS, 2003).

This paper will examine whether economic factors can help explain the substantially lower rates of obesity in Japan in comparison to the United States. Viewed at its simplest, a person gains weight when their caloric intake exceeds the calories expended through basic metabolism and physical activity. For every 3,500 calories consumed in excess of calories expended a person can expect to gain one pound. Conversely, one pound can be lost by burning 3,500 calories more than consumed (Zahour, 2006). Economists have sought to explain the increase in obesity rates over time in the United States by the decreasing relative cost of food, in particular the cost of calories and fat, and the increasing cost of physical activity (Philipson and Posner, 1999 and Cutler, Glaeser, and Sharpiro, 2003). The relative price of food has declined substantially due to technological changes, which have increased the efficiency of production in agriculture and distribution throughout the food system. Furthermore, technology has eliminated much of the

need for physical activity during work or for mobility. For most Americans, getting significant physical activity now requires a conscious commitment to exercise, which comes with a substantial time cost, as well as a monetary cost in many cases, such as the price of a golf game or gym membership. In the not so distant past, the majority of jobs entailed heavy physical activity, so people were in a sense being paid to exercise.

Our analysis of the economic factors that might explain the marked difference in obesity between the United States and Japan will focus on the relative price of food and of physical activity or inactivity in the two countries. Although economic factors can help explain the difference, there are also other explanations, such as Japan's dietary traditions. Moreover, possible effects on obesity have never been a consideration in the establishment of major economic policies in either country, whether one considers agricultural price policy, taxes on gasoline, or macro economic policies. However, the concluding section will discuss policies that could reduce obesity by changing the structure of economic incentives.

Food Consumption, Prices and Dietary Tradition

The average Japanese consumes fewer calories and less fat than the typical American, which in part simply reflects the smaller stature of the Japanese. Basic demand theory would suggest that the substantially higher price of food in Japan would also be a factor. In addition, the traditional Japanese diet with its emphasis on rice, vegetables, and fish, with very little fat, is very conducive to maintaining a pattern of lower calorie consumption.

Food Consumption

The average daily caloric intake of Japanese over one year old was 1,930 calories in 2002, 2,141 for males and 1,745 for females, as collected by dietary recall and/or records (Ministry of Health, Labor, and Welfare, 2002). The average fat consumption was 54.4 grams, 58.7 for males and 50.7 for females. In comparison, the average caloric intake for Americans ages 1-85 (those over age 85 were not included in the survey) was 2,168 calories in 2001-2002, 2,516 for males and 1,839 for females (also collected by dietary record and recall). The average for total fat was 80.6 grams, 93.3 for males and 68.5 for females (NCHS, 2006b).

Food balance sheets, also referred as food supply and utilization data, can be used to compare the per capita availability of calories back to 1960 in the two countries. The calories available rose only slightly in Japan between 1960 and 2003, from 2,291 to 2,558 (Ministry of Agriculture, Forestry, and Fisheries, 2005). Over the same period, the U.S. per capita availability of calories increased from 3,100 in 1960 to a rather astounding 3,900 in 2003 (ERS, USDA, 2006). While the increase from 1960 to 2003 was only 267 calories per capita in Japan, in the United States it was 800 calories per person. These data, of course, reflect the calories in the foods available at the retail level for consumption and not actual caloric intake, which was provided in the previous paragraph. However, these data do suggest the sheer abundance of food, especially calorie dense food, Americans have available and, hence, are tempted by.

Prices

As was probably obvious to anyone who has visited Japan, food is considerably more expensive than in the United States. As a share of total consumer expenditures the average Japanese

household spent 23.2 percent on food in 2003, 19.6 percent for food consumed at home and 3.6 per cent for food away from home (Ministry of General Affairs, 2005). In comparison, the average American household devoted only 13.1 percent of their total expenditures to food, 7.7 percent for food at home and 5.4 percent for food away from home in 2003 (Bureau of Labor Statistics, 2005). Engel's law, which states that as income rises the budget share for food declines, might explain this difference between the two countries, if Japan were not one of the highest income countries, along with the United States.

Gross national income per capita was \$34,180 in Japan in 2003 (converted from Yen into U.S. dollars at the official currency exchange rate) and \$37,870 in the United States. Converted at a purchasing power parity (PPP) rate, which adjusts for price differences between countries, Japanese PPP per capita income was \$28,450 (World Bank, 2005). Although somewhat lower than to United States, this difference is certainly not large enough to explain the far higher food budget share in Japan on basis of Engel's law alone. Therefore, we much conclude that food prices are substantially higher in Japan and/or the Japanese wish to spend more for higher quality.

A comparison of prices in 1999 found the overall price of food to be 49 percent higher in Tokyo than in New York City (Ministry of General Affairs, 1999). Table 1 compares the prices in April 2006 of several similar products in a grocery store in Tokyo and a supermarket in a suburb of St. Paul, Minnesota in the United States. The data were collected by the authors and obviously do not represent a statistically valid sample. However, the prices have the advantage of being current and are consistent with other comparisons that found food prices to be substantially

higher in Japan. In order to be equivalent the package size was adjusted for either Japan or the United States. For example, bread in the United States is typically sold in a loaf with 22 slices, whereas in Japan a standard package size is six slices. The price per slice of a loaf of bread in the U. S. was determined and multiplied by six for the comparison.

In Table 1, the original Yen price was converted into U. S. dollars at both the then current exchange rate of 116 Yen = \$1 U. S. and also at the PPP rate for 2005 of 129:1(a rate for 2006 was not yet available) determined by the OECD (2006). An attempt was made to choose standardized products that would be similar in the two countries. In two cases, the same brand name product was sold in both stores, De Cecco spaghetti and Haagen-Das ice cream. In addition, the white bread, eggs, milk, and potato chips all appeared to be similar in quality. In the Tokyo store, a wide variety of different quality rice was offered, priced from 1,580 to 3,480 Yen for five kilograms. The store brand, which sold for 1,980 Yen, was chosen for comparison. In every case except for De Cecco spaghetti, which is imported from Italy in both countries, the product prices were higher in Japan. In the case of white bread, eggs, ice cream, and rice the Japanese price was more than double the U. S.

In terms of the reasons for the higher price of food, Japan has long been criticized for its protectionist rice policy, which causes the domestic price to be far higher than the world market price of rice. The domestic price of rice in 2000 was four times higher than the FOB (freight on board, meaning loaded and ready for shipment) price of rice produced in California (UNCTAD, 2006). Japan's rice policy has been based on protecting its small domestic producers, which are considered a cultural heritage that needs to be preserved, and on the basis of national food security, not to reduce obesity.

However, its rice policy is only a small part of the explanation for the higher price of Japanese food. Although it is changing, the food supply chain is far less efficient in Japan with more layers than in the U. S., where intensive competition and information technology has substantially reduced distribution costs (Coggins and Senauer, 1999). Another factor is what would appear to be a preference by Japanese consumers for quality and a willingness to pay for it. The clearest example is perhaps fresh fruit. Even in the typical grocery store each piece is close to perfection: unblemished, symmetric, and deeply colored. However, these policies that influence the price of food in Japan were never formulated with reducing the rate of obesity as an objective. Moreover, given their high level of income, food prices probably have a limited effect on the Japanese level of caloric intake.

The traditional diet in Japan has helped keep its people both thinner and healthier than other developed, industrialized countries. A food pyramid depicting a traditional Japanese, or other Asian, diet has much in common with the pyramid of the traditional Mediterranean diet. They both share a base built around grains, with plentiful consumption of vegetables and fruits, and also fish, but relatively little animal fat, meat and sweets (Pharmacy and Health: Health Guide, 2006). There is an old Japanese saying, “we eat with our eyes.” The presentation of the food is very important, and particular attention is given to the colors and textures. Foods are enjoyed as much for their eye appeal as their flavor (Samuels, 2005). Each food is served on a separate plate or in a separate bowl. Portions are much smaller at a Japanese restaurant or home prepared meal than typical in the U.S. An elegant dining experience might consist of dozens of small dishes, some no more than a few bites. The meal is meant to be beautiful, as well as delicious.

Fruit is usually served at the end, rather than a rich desert. Traditionally in eating the Japanese have applied the concept of “enryo” (restraint) (Samuels, 2005).

Although traditional food customs are still quite strong in Japan, dietary habits are changing. The adoption of more Western foods and eating habits is increasingly common, especially among Japanese children and men. In 1960, rice provided 48.3 percent of the calories available in the Japanese food supply. This figure was down to 23.3 percent by 2003 (Ministry of Agriculture, Forestry, and Fisheries, 2005). The percent of calories from fat increased in the same period from only 11.4 to 29.0. An Associated Press (2006) article entitled “Japanese struggle with rising obesity rates” discussed one 10-year old girl, who had become some 50 pounds over weight. Her diet included “spaghetti and meat sauce for lunch, chocolate and cookies for a snack, rice balls for dinner and sandwiches at nighttime classes”, plus “some quick noodles before going to bed” (Associated Press, 2006).

Physical Activity and the Cost of Inactivity

The major explanation for the much lower rate of obesity may be that the Japanese are far more physically active than Americans. However, this is not because the Japanese go to the gym or engage in planned physically activities more than Americans. The answer is that they walk far more as part of their daily lives and do not even report it as (planned) physical exercise. Only 29.7 percent of Japanese 20 years old and over reported they engaged in regular physical exercise activity in 2002: 31.6 percent of men and 28.3 percent of women. For those 20-59 years old the figure was only 23.5 percent, whereas it was higher for those over 60 years old (Ministry of Health, Labor, and Welfare, 2002).

In 2003, 46.0 percent of Americans, 18 years old and over, said they engaged in a moderate level of physical activity for 30 minutes or more at least five times per week or a vigorous level for 20 minutes or more at least three times a week, which was the minimum recommended level at that time (U. S. Census Bureau, 2006). The figure was 48.2 percent for men and 44.0 percent for women. The majority of Americans, 54.0 percent, did not meet these recommended levels of activity and 24.3 reported no physical activity. The goal of 30 minutes of moderate-intensity exercise could have been met by simply walking two miles at 15 minutes per mile (CDC, 2006). Moreover, the exercise goals set by the federal government have been substantially raised as reflected in MyPyramid, the new food pyramid released by in 2005. MyPyramid recommends physical activity of at least 30 minutes most days, but goes on to call for 60 minutes daily to avoid weight gain, and 60-90 minutes to lose weight (USDA, 2005).

Walking

The major difference is that Japanese walk much more in their daily lives than Americans. Walking is a simple, but effective form of exercise that everyone except the disabled can engage in. As shown in Table 2, the average Japanese person 15 years old and above walked 7,421 steps per day in 2002, about 3 ¾ miles (Ministry of Health, Labor, and Welfare, 2002). Pedometers were provided that counted the steps of survey participants. Normally the assumption is made that 2000 steps equals one mile and walking a mile at a moderate pace burns about 100 calories (Shape Up America, 2006). The average length of a step for the Japanese may be less than for the average American, who is taller. However, this data was not available.

Japanese males age 15 and older walked an average of 7,573 steps, with men ages 15-49 walking 8,700 steps, over 4 ½ miles daily, burning approximately 450 calories in the process. Even men 50-69 walked 7,785 steps daily, and only over age 70 and above did it decline to 4,787 steps, somewhat less than 2 1/2 miles. Since there was no upper limit on age in the survey this included those in their 80's, 90's and older. Japanese females age 15 and over walked an average of 7,140 steps daily, with those ages 15-39 walking 7,719 steps on average and those ages 40-59 8,082 steps on average. Over age 70 for women it declined to 4,328 steps, still well over two miles daily.

The statistics on walking are not as good for the United States. The National Health and Nutrition Examination Survey does collect data on physical activity, but not directly on walking. James Hill, Director of the Center for Human Nutrition at the University of Colorado Health Sciences Center and co-founder of America on the Move, a weight gain prevention program that emphasizes walking, shared the results of a recent representative survey of Americans on walking conducted by Harris Survey. The survey, which provided pedometers to participants, found that men walked an average of 5,940 steps and women 5,276, (Hill, 2006). These results are consistent with other findings. Nico Pronk, Vice President of the Center for Health Promotion at HealthPartners, a health insurance cooperative, and one of the developers of the 10,000 Steps program to reduce obesity, indicated that the average American walks between 4,000 and 5,000 steps per day (Pronk, 2006).

A study in Colorado, which has the lowest rate of obesity of any of the 50 states, found that a representative sample of adults had a BMI of only 25.3 and walked an average of 6,804 steps

daily, considerably more than the average for Americans (Wyatt et al., 2005). There was a direct correlation between walking and weight. Obese individuals (BMI>30) walked about 2,000 steps less per day in the Colorado study.

A sedentary person in the United States may walk only 1,000 to 3,000 steps per day and almost a quarter of American adults fell in this category, as reported previously (Walking Site, 2006). At the other extreme, a study of a traditional lifestyle Amish community found that the men walked an average of 18,000 steps daily (9 miles) and the women 14,000. Not surprisingly, none of the men and only two of the women of the 96 in the sample studied were obese, a rate of only 4 percent (About.com, 2006).

Costs of Automobile Use and Public Transportation

Significantly, there is an economic explanation underlying this disparity in walking between Japan and the United States. The cost of owning and operating an automobile is much higher in Japan, whereas the cost of using public transportation is lower. Anyone who has used public transportation knows that it usually entails walking, since it does not take you from the door of your home to that of your workplace or other destination. Americans who commute to work in their cars or drive to go shopping may simply drive from their garage and then may park only a few hundred feet or less from their workplace or the shopping mall, doing whatever they can to minimize any walking.

In terms of the costs of operating a car, the price of gasoline in Japan is about double that in the United States. In 2004, before the recent sharp rise in prices, gasoline in Japan was selling for the equivalent of \$3.79 per gallon (Japan Auto Trends, 2004). In the United States, regular unleaded gasoline sold for a nationwide average price of \$1.88 per gallon in 2004 (U.S. Energy

Information Administration, 2006). Interestingly, the price of gasoline was considerably lower in Japan than in a number of other countries. In the countries in Western Europe, gasoline cost between approximately \$4.56 and \$5.64 per gallon in May 2004, because of the high rate of taxation (CNN Money.com, 2006).

However, the ownership and operation of a car is particularly expensive in Japan because of high automobile taxes and registration fees, required bi-annual inspections, and high parking fees in large cities (Japan-Guide.com, 2006a). The taxes and registration fees for even a small, new car that sold for 1,500,000 Yen (\$12,931, converted into U.S. dollars at 116:1) were some 300,000 Yen (\$2,586) (Carlife-navi.com, 2006). The compulsory safety inspection, which is required every two years except on new cars that are less than three years old, costs between 100,000 and 200,000 Yen (\$862 and \$1,724). The inspection includes a tax on the weight of the car, typically between 8,000 and 50,000 Yen (\$69 and \$431) (Japan-Guide.com, 2006b).

There is also an annual tax that is based on the size of the engine and is between 10,000 and 50,000 Yen (\$86 and \$431). Certain insurance is mandatory, but most drivers carry additional insurance to provide full coverage (Japan-Guide.com, 2006). Anyone who lives in a large city and does not have a parking space for their vehicle must pay a monthly parking fee, which is approximately 35,000 Yen (\$300) per month in Tokyo, some \$3,600 annually. The written and practical exam to obtain a driving license in Japan is very difficult. Many people must take it several times before they pass. Many Japanese take private driving classes, which typically costs several thousand dollars, to prepare for the exam (Japan-Guide.com, 2006).

In major, densely-populated metropolitan areas, in which a large proportion of the population of Japan live, in addition to the monetary costs, the time costs of using a car for transportation are very high. Due to the work of Gary Becker, who won a Nobel Prize in Economics, it is now widely accepted that since time is scarce, it has a value. People respond to a higher time cost related to an activity just as they would to an increased monetary price, by demanding less (Becker, 1965). Major Japanese cities are not designed for commuting from outlying areas or traveling within the city by car. Unlike U.S., cities they do not have extensive networks of freeways and expressways or even many broad boulevards. In addition, most American cities have lots of underground and/or above ground parking structures; Japanese cities do not.

On the other hand, major Japanese cities have some of the best public transportation networks in the world. It is far more convenient, from the economists viewpoint the time costs are much lower, to use public transportation than an automobile. Even most tourists visiting Tokyo discover that the extensive subway system is not only a much cheaper, but also a much faster way to get around the city than using taxis. The tourist also finds out that in using public transportation, they also typically do a lot of walking. Japanese commuters can purchase long-term passes for travel between home and work at very reasonable rates. Unlike the United States where many companies subsidize driving by providing parking for their employees or paying for their parking costs, in Japan many businesses pay for their employees' commuting costs using public transportation (Japan-Guide.com, 2006a).

Japan also has one of the best passenger railroad systems in the world, which provides fast, convenient, reliable inter-city service. Even the rural areas of Japan are well served by rail and

bus service. Driving longer distances in Japan entails not only the cost of gasoline, but expensive tolls are charged on many of the expressways. Driving may also take more time than the train. Japan is, of course, famous for its high speed, bullet trains, the “Skinkansen” (Bullet Trains, 2006). Therefore, both the monetary and time costs of driving are higher. The traveler without a car could take a taxi at their destination, but frequently it is more convenient and cheaper to just walk (Japan-Guide.com, 2006b).

Conclusions

In this section, the policy implications of the comparison of obesity in the United States and Japan will be discussed. The discussion will focus on economic policies that could create incentives to either eat less or get more exercise, especially walking as part of daily activities. Americans have developed unhealthy habits in response to the low price of food, especially calorie dense foods, and the low relative price of driving a car for transportation. However, these habits could be changed by altering the structure of economic incentives on which people base their decisions. Economic policies could be used to create incentives to both reduce excess calorie consumption and excessive reliance on the automobile.

A tax on food has been suggested, particularly foods that are high in calories and low in nutrients. Very high taxes have been imposed on cigarettes and other tobacco products to improve the public’s health. However, eating is not like smoking. Eating is both an absolute necessity and intrinsically healthy, whereas smoking or other uses of tobacco have unquestionably been shown to pose serious health risks. Most states in the United States use sales taxes, which are a fixed percent of the retail purchase price (say 6 percent) to raise revenue.

In most cases, the sales tax is applied to food service purchases. Some states, such as Virginia, collect sales tax on food purchased in grocery stores. However, a direct tax on food, even on high calorie foods low in nutrients, for the purpose of reducing obesity is almost certainly not politically feasible. There are obviously powerful vested interests that would oppose it. In addition, a tax on food is regressive, since those with lower incomes spend a large share of their budget on food. More importantly, most Americans would view such a tax as interfering with the freedom of choice that is seen as the right of adult consumers in terms of legal products.

The possible impact of U. S. agricultural subsidies on obesity is a topic for another paper (see Vosti, 2006). The essential argument is that farm subsidies reduce the cost of food and hence encourage over-consumption. Moreover, healthier foods such as fruits and vegetables, which Americans under-consume, are not subsidized and are substantially more expensive than calorie-dense foods. Most of the subsidization goes to a few commodities, particularly wheat, corn and cotton (U. S Census Bureau, 2006). The major impact on eating habits is probably to increase the consumption of meats and poultry, since most of the subsidized corn is used for animal feed. However, since the cost of the farm-level commodity as a share of the price of the retail food products has continued to decline and is now so low, the overall effect of subsidies on eating habits might be less than imaged. In addition, farm subsidies have been intransigent to enormous pressures for change from antagonists that range from environmentalist to those seeking trade reform.

A central conclusion of this paper is that the prevalence of obesity is lower in Japan in part because the Japanese walk more as part of their daily lives than Americans do. Furthermore, we

argued that a major reason for the difference is economic. The cost of owning and operating an automobile is much higher in Japan, especially when the time costs are factored in, so the Japanese are much more likely to use public transportation. The use of public transit usually requires more walking than driving ones own car. Therefore, policies that raise the cost of driving and lower the cost of public transportation would presumably increase physical activity and help reduce overweight and obesity among Americans.

Interestingly, there is evidence that the recent sharp increase in the price of gasoline is getting Americans to switch from driving to using public transportation for commuting (Peterson, 2006). A substantial increase in the tax on gasoline might not only increase physical activity and reduce obesity, but would also reduce Greenhouse gas emissions and U. S. dependence on uncertain sources of foreign oil, in many cases from countries ruled by autocratic governments. However, with the current high price of gasoline any serious consideration of increasing the gas tax would be very unpopular with most Americans and is absolutely not feasible politically. On the other hand, following any sustained decline in prices, an increase in gasoline taxes might have a chance with bold and persuasive political leadership.

Most American cities are ill prepared to handle a major shift towards the use of public transportation, since mass transit infrastructure has been under-invested in for decades in most cases. In fact, one of the factors keeping people away is the inconvenience of public transportation, the high time costs, because of the lack of funding and hence poor service. The problem is also more complex. Japanese cities and their public transit systems have grown together. With the partial exception of a few cities, such as New York City and Washington,

D.C. with their extensive subway systems, the pattern of development of most American metropolitan areas is not conducive to public transit systems. As they have continued to sprawl, population densities are low, and travel patterns have become more mixed. The traditional commute was from the suburbs to the city center. Now, many workplaces have migrated to the suburbs and people have moved even further out.

Separate efforts should be made to lower the time cost of exercising, especially walking, by making it more convenient for people. More funds could be put into urban walking and bike pathways. Walking in cities can be made safer, both in terms of traffic and crime. Employers could provide a longer lunch period, at least an hour, to employees who used at least half an hour to walk. Such programs would also be relevant in Japan to help achieve the goal of increased physical activity set by the government (Ministry of Health, Labor, and Welfare, 2002).

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Table 1.

Food price comparison: Tokyo and St. Paul, MN (selected items, April 2006 in U. S. dollars)*

	Tokyo		St. Paul, MN
	Current	PPP	
1. Eggs - 12 medium or large	2.26	2.03	.87
2. Milk – 1 litre	1.70	1.53	.95
3. Potato Chips - 190 grams	1.71	1.53	1.23
4. Rice – 5 kg**	17.07	15.35	7.36
5. White Bread - 6 slices	1.63	1.46	.56
6. De Cecco spaghetti – 1 lb.	1.63	1.47	1.99
7. Hagen-Das Ice Cream -1 pint	6.02	5.41	2.79

Source: Data collected by the authors.

* Prices were collected in a Tokyo grocery store and a St. Paul supermarket by the authors. The package size was adjusted in either the U.S. or Japan so the two match. The yen to U.S. dollar conversion was done at both the official rate then current, 116 Yen = \$1 U.S. and the 2005 PPP (purchasing power parity) rate of 129 Yen = \$1 U.S. (OECD, 2006).

** Five kilograms of rice in the Tokyo store varied from 1,580 to 3,480 Yen depending on quality. The store brand priced at 1,980 Yen was used in this comparison

Table 2.

Average steps walked by Japanese age 15 and over, by age and gender.

Age in Years	All	Males	Females
15 & Above	7,421	7,753	7,140
15-19	8,459	8,911	8,046
20-29	8,225	8,850	7,697
30-39	8,162	8,802	7,600
40-49	8,242	8,405	8,098
50-59	7,928	7,765	8,070
60-69	7,547	7,806	7,313
70 & Above	4,517	4,787	4,328

Source: Ministry of Health, Labor, and Welfare, Japan, (2002). The National Nutrition Survey of Japan, 2002, p. 134, Tokyo.