Raffles Institution
Preliminary Exams September 2014

ECONOMICS 9808/01
Higher 3

24 September 2014

3 hours 15 minutes

Additional Materials: Answer Paper

READ THESE INSTRUCTIONS FIRST

Write your name, index number and CT class on all the work you hand in.
Write in dark blue or black pen on both sides of the paper.
You may use a soft pencil for diagrams, graphs or rough working.
Do not use paper clips, highlighters, glue or correction fluid.

Answer question 1 [Case-Study] and any **TWO** essays

At the end of the examination, fasten **case-study and the cover sheet** securely together. Fasten **each essay separately**

Place this cover sheet on top of your work.

The number of marks is given in brackets [ ] at the end of each question or part question.

COVER SHEET

Please indicate the question that you have attempted.

Name : _____

Index No : _____

CT Class : _____

Question No.	*For Examiner's Use Only* Marks
1	

Question One

Question 1

Figure 1

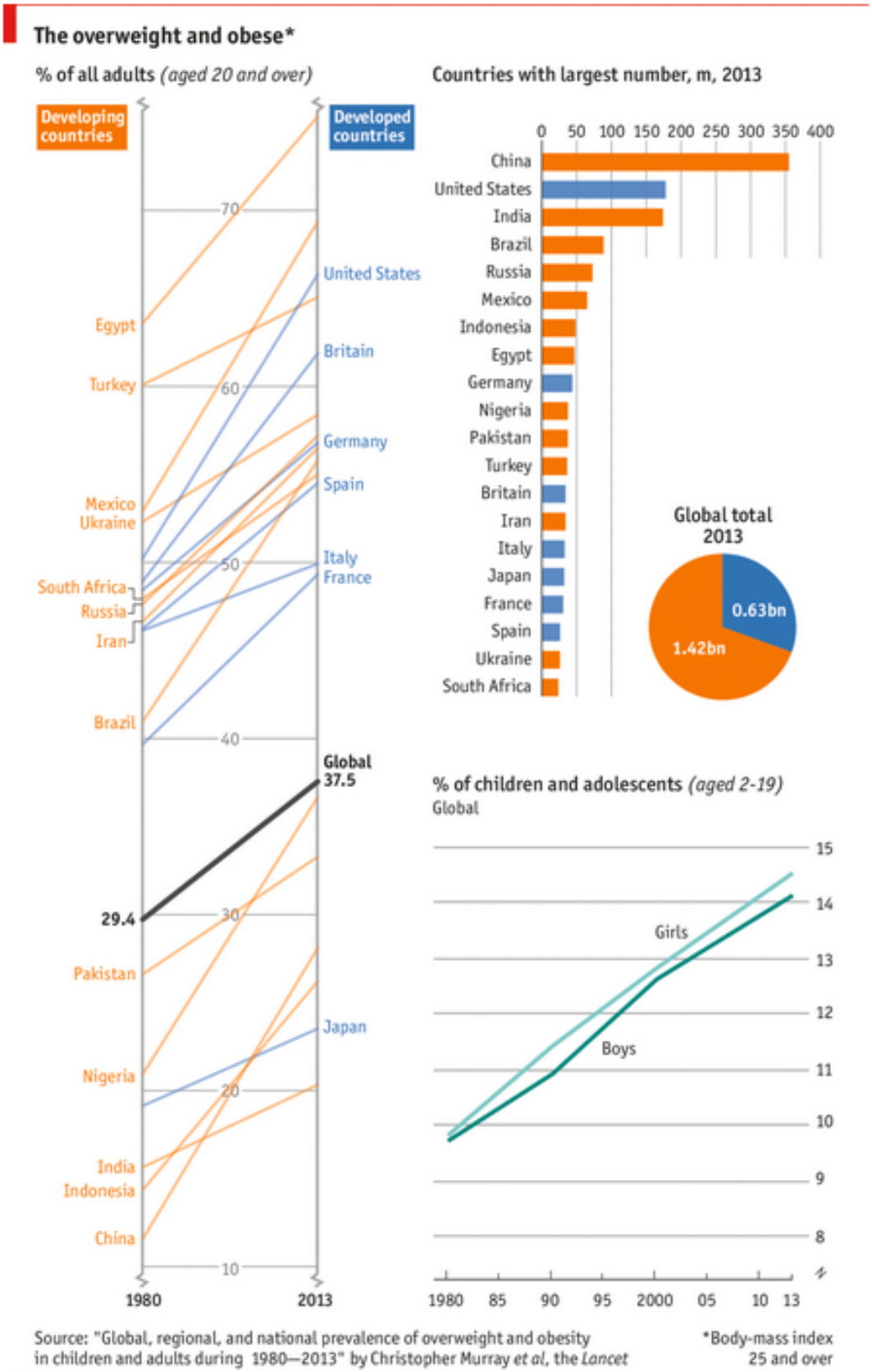

Figure 2

Country	Health Care Costs of Obesity	Percent of Health Care Spending	Year	Source
Australia	AUD$ 6.6 billion	Approx 7.6% of national health expenditures	2005	Colagiuri et al. (2010)
Canada	CAN$ 3.9 billion	2.6% of national health expenditures	2006	Anis et al. (2009)
England	£ 2.3 billion	3.3% of NHS expenditures	2007	Foresight (2007)
Ireland (ROI + NI)	€ 526 million	2.7% of total health expenditure	2009	SafeFood report (incl. Dee, O'Neill and Doherty) (2012)
Scotland	£ 175 million	2% of NHScotland budget	2007-08	Scottish Government (2010)
United States	US$ 190.2 billion	20.6% of national health expenditures	2005	Cawley and Meyerhoefer (2012)

Figure 3 **Cost Per [1]Quality-Adjusted Life-Year (QALY) Saved Of Various Interventions to Prevent or Reduce Obesity**

Intervention	Description	Estimated cost per QALY saved	Reference
Youth			
Coordinated Approach to Child Health (CATCH)	Comprehensive intervention in elementary schools	$900	Brown et al. (2007)
Planet Health	Comprehensive intervention in middle schools	$4,305 for females, not effective for males	Wang et al. (2003)
Moving School Bus	Adults walk set routes to facilitate children's walking rather than riding to school	Not effective	Moodie et al. (2009)
Adults			
Xenical (orlistat)	Anti-obesity drug that inhibits absorption of, and promotes excretion of, dietary fat	$8,327	Maetzel et al. (2003)
Meridia (sibutramine)	Anti-obesity drug that suppresses the appetite	$9,299	Warren et al. (2004)
Wheeling Walks	Communitywide campaign using paid media to encourage walking among sedentary adults	$14,286	Roux et al. (2008)
Gastric bypass surgery	Limits food intake by reducing the effective size of the stomach and bypassing part of the small intestine	$5,000–$16,100 for women, $10,000–$35,600 for men	Craig and Tseng (2002)
Social support to promote walking	Provision of maps, handouts on strategies for social support of walking, frequent calls to prompt participants to walk	$27,373	Roux et al. (2008)

Source: Cawley, *Health Affairs* (2010) Meridia withdrawn from the market later in 2010

[1] A **quality-adjusted life-year (QALY)** takes into account both the quantity and quality of life generated by healthcare interventions. It is the arithmetic product of life expectancy and a measure of the quality of the remaining life-years. QALYs provide a common currency to assess the extent of the benefits gained from a variety of interventions in terms of health related quality of life and survival for the patient.

Extract 1

The Economics of Obesity. John Cawley[2]

During the past three decades in the United States, many indicators of population health such as life expectancy, the prevalence of smoking, and drug and alcohol use among youth improved significantly.
In stark contrast to these trends, over the same period the United States also experienced a doubling of the prevalence of obesity, which is defined as a body mass index (BMI) of greater than or equal to thirty, which corresponds to a weight of 221 pounds for someone six feet tall. As of 2009 to 2010, more than one-third of adult Americans are obese.

The United States is not alone; many countries worldwide have experienced a significant increase in obesity, and the World Health Organization estimates that 2.8 million people die each year as a result of excess weight.

This has led to considerable debate about the causes and consequences of obesity and what can be done to prevent and treat it. Answering these questions is complicated because in many cases researchers cannot conduct randomized experiments: it would be unethical to experimentally manipulate individuals' weight. For this reason the empirical methods of economics, particularly the attention to issues of selection and omitted variables, are especially useful for identifying causal effects.

Measurement and Trends

An important limitation of BMI, the standard measure of fatness in epidemiology, is that it does not distinguish fat from lean mass: it simply measures weight for height. BMI tends to be less accurate at classifying men (among whom there is more variation in muscularity) than women. The use of BMI also results in biased estimates of health disparities; the black-white gap in obesity among women is only half as large if one defines obesity using percentage of body fat rather than BMI.

Economic Causes and Consequences of Obesity

Many theories have been advanced to explain the rise in obesity. To measure the extent to which income affects obesity, John Moran, Kosali Simon, and I exploit the natural experiment of the Social Security Benefits Notch. This is the result of a legislative accident that created variation in retirement income that was large, unanticipated, and beyond the control of the individual, making it a suitable instrument. We find little evidence that income affects weight.

Understanding the consequences of obesity is important for evaluating calls for government intervention and for measuring the cost-effectiveness of treatment and prevention programs. One important potential consequence of obesity is higher medical care costs. Fat releases hormones that lead to insulin resistance and damage the cardiovascular system, with the result that obesity is associated with a wide variety of health conditions such as diabetes, heart disease, and cancer. Previous studies estimated the correlation of obesity

[2] http://www.human.cornell.edu/pam/people/upload/Cawley-profile-NBER-Reporter-2013-no4.pdf

with medical care costs, which is difficult to interpret because weight may be correlated with important unobserved factors (such as socioeconomic status) and there may be reverse causality (an expensive back injury may lead to weight gain).

Medical costs are much greater for those whose weight places them well above the threshold for obesity than for those who are only slightly obese. Thus obesity is a heterogeneous category, with much of the medical costs occurring among a small percentage of individuals with extremely high BMI. The results imply that 0besity attributable medical costs in the United States totalled $190.2 billion in 2005, or 20.6 percent of national health expenditures.

These estimates suggest that the magnitude of the obesity-related externalities imposed through public and private health insurance is greater than previously appreciated, and that historically the cost-effectiveness of methods of preventing and treating obesity may have been underestimated.

Given the effect of obesity on health, one would expect obese individuals to experience worse labor market outcomes than non-obese individuals. I find that weight lowers wages for white females: an increase in weight of two standard deviations (roughly 64 pounds) is associated with 9 percent lower wages. In general, the labor market consequences of obesity are greater for women than for men, and greater for white females than for other females. It is impossible to say whether the labor market consequences of obesity are the result of relatively worse health impairing productivity, or to employer discrimination, but other studies suggest that discrimination plays an important role.

Policies to Prevent or Reduce Obesity

There are many policies and programs to prevent and reduce obesity, and an important contribution that economists can make is to evaluate these programs. For example, the Centers for Disease Control, the American Academy of Pediatrics, and the Institute of Medicine have called for increases in physical education (PE) for school children, despite a lack of evidence that it has any impact on youth weight. Using data on high school students we find that increasing PE requirements increases physical activity among girls (not boys) but has no detectable effect on weight. It is possible that increased PE requirements increase muscle mass and decrease fat mass, with little net effect on weight.

An innovative approach is to offer obese individuals financial rewards for weight loss. Insurance companies may face lower claims and employers may experience lower job absenteeism and higher productivity if their enrollees or employees lose weight; as a result, these organizations are increasingly seeking a win-win solution by offering overweight individuals financial rewards for weight loss. In addition, people with time-inconsistent preferences may be willing to put their own money at risk, hoping that loss aversion will provide them with incentives to lose weight in order to get the money back.

To evaluate the effectiveness of these approaches, Joshua Price and I examine outcomes in a workplace wellness program that offers financial rewards and deposit contracts for employee weight loss. Interesting features of this program include its large sample size (2,635 workers across 24 work sites) and long duration (one year). We find that attrition

in this program is high: 42.9 percent dropped out by the end of the first quarter, and 68.0 percent by the end of the year-long program. We find modest results in the program.

Discouraged by failed attempts at weight loss through dieting and exercise, substantial percentages of Americans have taken over-the-counter (OTC) weight loss products. There is very little, if any, evidence suggesting that these products are effective, and some have potentially fatal side effects. There is little evidence that advertising of OTC weight loss products expands the size of the market. Instead, advertising seems to be a way to battle for market share.

The Usefulness of Economics in Studying Obesity

Economics offers theoretical frameworks for human behavior (e.g. constrained maximization) Economists ask different questions, generate different predictions and focus on different causes: e.g. prices, income, trade-offs.

Economics offers clearly-defined rationales for government intervention to fix market failures. It offers useful methods for estimating causal effects and determining causes and consequences of obesity, what interventions or policies work and which policies work best.

Individuals choose their diets (quantity, quality) and physical activity in order to maximize their utility (happiness). Money and time are scarce, so in order to maximize their utility people consider costs and benefits, and the relevant trade-offs. Individuals may rationally accept higher body weight in exchange for other things they value the fact that a person is clinically overweight is not proof they are irrational.

To understand obesity, we need to understand why some people find it optimal to engage in the health behaviors that lead to obesity: Low income? High prices of healthy foods? High time cost to acquire fresh fruits and vegetables? High opportunity cost of time (children, paid work)? High marginal utility of eating, being sedentary?

When costs and benefits change, people will alter their choices. Possible explanations for recent rise in obesity include falling real prices of energy-dense foods, increased entertainment options and more sedentary employment. Telling people they “should” behave differently will have no effect –to change people’s behavior, you need to make it in their interest to change – alter the tradeoffs that they face to incentivize behavior change.

Economic Explanations for Rise in Obesity

- Falling prices of high-calorie (energy dense) foods 1990-2007: price of 2L of Coke fell 34.9% Lakdawalla and Philipson (2002) argued 40% of recent rise in weight due to lower food prices.
- Technological change made preserved packaged snacks cheaper, more enjoyable (Cutler et al., 2003)
- Increased maternal employment contributes to youth obesity in high-SES families (Anderson et al., 2003) Cawley and Liu (2012): working mothers spend significantly fewer minutes cooking, eating and playing with children. Fathers make up little of the slack

- Additional income has no detectable effect on weight of the elderly (Cawley et al., 2010) Does not support claim of WHO that rising obesity due to rising incomes

Findings
Obesity raises annual medical care costs of adults by $2,741 (160%) e.g. it raises medical costs from roughly $1,700 (avg for non-obese) to roughly $4,500 (average for obese) nearly twice the previous estimates. The cost of obesity higher for women ($3,613) than men ($1,152)

Impact of obesity on per capita medical care costs
Inpatient care: $1,116; Prescription drugs: $919 and Outpatient care: $860.
Aggregate annual costs of adult obesity for the U.S.: $190.2 billion Equals 20.6% of U.S. National Health Expenditures

Obesity & Market Failure
- Imperfect information e.g. Nutrition Facts labels resulted in 3.36 percentage-points less obesity for white females [Variyam and Cawley (2006)]
- Consumers may be protected from failures of rationality e.g. regulate advertising to children, limit food options in schools, require physical education in schools
- External costs of obesity U.S.: $3,521 higher spending by Medicaid on each adult obese beneficiary in 2005 (Cawley and Meyerhoefer, 2012). People don't bear full costs of their actions, which may lead to underinvestment in obesity prevention.

Strategies for Internalizing External Costs

Carrots. Workplace wellness programs offering financial rewards for weight loss; Cawley and Price (2011, 2013) find high attrition and low weight loss.

Sticks. ACA allows group health insurers to charge 30% higher premia to enrollees who are overweight but won't participate in wellness programs. Reduced health insurance benefits for those engaged in unhealthy behaviors; e.g. in 2007 West Virginia limited Medicaid benefits (incl Rx) for those with unhealthy lifestyles – weight reduction a principal goal

Policies to Internalize External Costs
- Tax energy-dense foods Soda pop taxes (e.g. Brownell)
- Ireland had tax on "table waters" (incl. fizzy drinks) from 1916-92
- Denmark dropped "fat tax" because of cross-border shopping to Germany
- The small soft drink taxes implemented in the US have no detectable effect on weight; Fletcher et al. (2010)
- Subsidize physical activity e.g. public-school sports teams, gyms, PE/recess, public parks For many grades, no evidence PE reduces weight; Cawley et al. (2007, 2013)

The economic rationale for government intervention is to fix market failures. The success of such programs can be measured by how well they fix the market failure, not by how much they alter diet, physical activity, obesity etc.

Questions

1.

a]	Comment upon Fig 1	4 marks
b]	Comment upon the efficiency of the interventions shown in Fig 2	4 marks
c]	Assess the economic costs of obesity in the USA	10 marks
d]	Evaluate the usefulness of economics in addressing the issues generated by obesity	12 marks

Essay Questions: Answer any **TWO** questions
Each question is worth 35 marks.

2. New ideas are sold very much the way new automobiles are sold: by exaggerating their superiority over the older models. [George Stigler]
Discuss.

3 Mainstream economics is a pitifully thin distillation of historical wisdom on the topics that it addresses. It should be applied to whatever practical problems it can solve; but its tools and assumptions should always be in creative tension with other beliefs concerning human wellbeing and flourishing. What students are taught today certainly does not deserve its imperial status in social thought.
[Robert Sikdelsky 2014]

What should economics students be taught?

4 In 1970 Milton Friedman called corporate social responsibility “hypocritical window dressing,” In 2013 Howard Schulz of Starbucks claimed “To be a benevolent organization, you have to make a lot of profit, but if your sole goal is to maximize profit, you’re on a collision course with time.”

Who is right?

5 Recruitment agencies, head-hunters, employment agencies.

Discuss whether they make the labour market more or less efficient.

6 “It [Comparative Advantage] is indeed nothing more than an abbreviated account of the conditions of supply.” [Prof. Bertil Gotthard Ohlin]

Discuss whether the Law of Comparative Advantage, like every dog, has had its day.

7 “The fact, however, that the present form of globalization offers as much suffering as it does prosperity, as well as the failure of the IMF-led 'one-size-fits-all' economic model, shows that globalization is not an inevitable occurrence. Instead, it is a phenomenon led by the West, for the benefit of the West.” [Eyrun Bernhardsdottir]

Discuss