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BULLETIN ON AGING AND HEALTH

Health Care Expenditures in the OECD

Health care expenditures have been growing much more rapidly than income in the U.S. and other developed countries for some time. In the U.S., for example, health care expenditures as a share of GDP have tripled since 1950, from 5% then to 15% today.

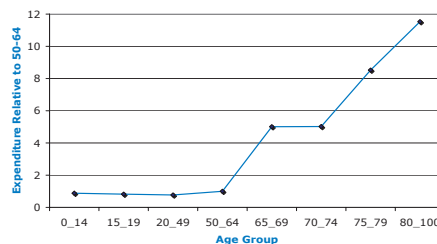
Less well understood are the causes of this dramatic increase — in particular, how much of the rise is due to an aging population and how much is due to rising expenditures per person at a given age. This distinction is important because benefit levels are determined by government policy, while demographics are largely outside government control. Being aware of the relative contributions of demographics and benefit growth can help policy makers project future expenditures more accurately and make better decisions about how to allocate scarce government resources.

In “Who’s Going Broke? Comparing Healthcare Costs in Ten OECD Countries,” (NBER Working Paper 11833), **Laurence Kotlikoff** and **Christian Hagist** explore this issue. Their analysis uses OECD demographic and health expenditure data along with age-healthcare expenditure profiles for each country to measure growth in real healthcare benefit levels between 1970 and 2002 in ten countries: Australia, Austria, Canada, Germany, Japan, Norway, Spain, Sweden, the UK, and the U.S.

Figure 1 illustrates the age-healthcare expenditure profile for one partic-

ular country, the U.S. The profile rises sharply with age — the average expenditure per capita for those age 75 and above is eight to twelve times as large as for the reference group, those ages 50 to 64. In Austria, Germany, Spain, and Sweden, by contrast, the average expenditure per capita is only twice as large for the oldest old as for the reference group. The other countries lie somewhere in between, with relative spending factors for the oldest old ranging from four to eight.

Figure 1: Age-Healthcare Expenditure Profile for US



The authors note that the profile for the US is so steep in part because the elderly have virtually universal coverage through Medicare, while many working-age adults are uninsured. The steep profile indicates that the U.S. will likely experience very rapid growth in overall health expenditures in coming years, as its population continues to age.

Next, the authors use these profiles, population data, and the growth in total health expenditures to calculate the growth in per capita benefit levels between 1970 and 2002. They find that real per capita benefit levels grew at a 4.1% annual rate on average

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across the ten countries over the period, a full two percentage points higher than the average growth rate of real per capita GDP.

A simple example illustrates the importance of the growth in real per capita benefits. In 1970, Sweden had the highest level of per capita government health spending, while Norway spent one-third less. Over the next thirty years, Norway’s benefit level grew at 5% per year, more than double the growth rate experienced in Sweden, and by 2002, Norway’s per capita expenditures were nearly 60% higher than Sweden’s.

Norway, Spain, and the U.S. experienced the highest growth rates over the period, 4.6% to 5%. Canada and Sweden had the lowest, at 2.3%, while the other countries lay about halfway in between. The authors note

that Canada and Sweden's low growth rates are unsurprising, given their use of rationing to limit health care spending. Conversely, the high rate of benefit growth in other countries likely results from costly product innovations, such as the acquisition of CT scanners.

Next, the authors calculate the share of total benefit growth that is attributable to demographics. They find that demographics are relatively unimportant; on average, three-quarters of health care expenditure growth can be traced to growth in benefit levels.

Finally, the authors present the budgetary implications of permitting

benefit levels to continue to grow at historic rates. Assuming a 3% discount rate, the U.S. is projected to double expenditures as a share of today's GDP in 20 years and triple them in 40 years. Increases in most other countries are smaller, but nonetheless quite significant. The authors note that "letting benefits grow at historic rates even on a relatively short-term basis is extremely expensive. It locks in high benefit levels for years and generations to come."

The authors conclude "growth since 1970 in aggregate healthcare spending by our ten OECD governments reflects first and foremost growth in benefit

levels. Although OECD countries are projected to age dramatically, growth in benefit levels, if it continues apace, will remain the major determinant of overall healthcare spending growth." They note that continued very rapid growth in benefit levels is clearly unsustainable and that benefit growth must eventually slow to the growth rate of per capita income. However, the U.S. has not yet made any move in that direction and indeed has recently increased the rate of benefit growth with the addition of a Medicare prescription drug benefit.

Will the Rising Social Security Full Retirement Age Affect the Disability Insurance Rolls?

The number of adults receiving Disability Insurance (DI) benefits has risen dramatically in recent years, from 2.3% of adults aged 25 to 64 in 1985 to 4.3% in 2005. Today there are 6.5 million disabled workers on the DI rolls. Benefit payments to these beneficiaries and their dependents are nearly \$80 Billion per year, with an additional \$45 Billion in annual spending on their medical care through the Medicare program.

Many factors have been explored as possible contributors to the rise in the DI rolls, including less stringent medical examination, the aging of the baby boom, increases in female labor force participation, and recent recessions. Yet there is another hypothesis that has been suggested but not fully explored — that a rise in the Normal Retirement Age (NRA) for Social Security benefits might be encouraging more workers to apply for DI.

To understand why this might be the case, a brief review of how benefits are calculated is helpful. When a worker claims Social Security benefits before the NRA, the monthly benefit amount is reduced, since the worker will receive benefits for more years than someone who claims later. As the NRA rises — from 65 for workers born before 1938 to 67 for workers born in 1960 and later — the benefit reduction for

early claiming rises also. For example, a worker claiming at age 62 receives 80% of his full benefit if the NRA is 65 but only 70% if the NRA is 67. By contrast, a worker who applies for and receives DI benefits is not penalized for claiming before the NRA. Thus for early claimants, DI benefits are larger than Social Security benefits, and importantly, this difference is growing over time as the NRA rises.

The effect of the rising NRA on the DI program is the subject of a new study by **Mark Duggan, Perry Singleton, and Jae Song, "Aching to Retire? The Rise in the Full Retirement Age and its Impact on the Disability Rolls"** (NBER Working Paper 11811). In their analysis, the authors make use of the fact that the relative generosity of DI and Social Security benefits varies across individuals depending on their year of birth, due to the ongoing increase in the NRA. They conduct their analysis using Social Security administrative records for a 1 percent sample of all U.S. workers born between 1935 and 1945, giving them a very large sample and allowing them to accurately calculate benefit entitlements and track claiming behavior.

The ratio of Social Security benefits to DI benefits in their sample varies between 75% and 80%. It is expected that a higher ratio will be associated

with a lower probability of DI enrollment, since it is most advantageous to claim DI when the difference between the two benefits is greatest.

In their simplest specification, the authors find a negative relationship as expected, but it is not statistically significant. However, the authors point out that older workers would likely be more responsive to changes in this ratio, since DI applicants are required to spend five months out of the labor force and this requirement is less costly for older workers who may be planning to retire in any event. When the authors allow the effect to vary with age, they find that it is much stronger and highly significant for older workers, particularly those aged 63 and 64.

To test the validity of their findings, the authors conduct a "placebo test" that assumes the increase in the NRA took place eight years earlier than it actually did and assigns workers the ratios that would have occurred in that case. Reassuringly, they find no effect of the ratio.

The authors also explore whether the importance of the ratio varies with income and find that it is stronger for low-income workers, as might be expected since Social Security benefits replace a larger fraction of pre-retirement earnings for these workers and they are more likely to be in poor health and able to

qualify for DI.

Finally, the authors use their estimates to forecast the aggregate effect of the rise in the NRA on DI enrollment. They project that once fully phased in, the NRA increase will raise the proba-

bility that men aged 63 and 64 are on DI by 1.6 percentage points, or 13 percent. However, the effect on overall DI enrollment would be modest—the authors project that an additional 42,000 men would be on DI in the long run, which

represents only a 1.3 percent increase in total DI enrollment and would offset only 4 percent of the financial savings gained by raising the NRA.

This research was supported by a grant from the Alfred P. Sloan Foundation.

Do Advertisements for Smoking Cessation Products Help Smokers Quit?

Tobacco use is the leading preventable cause of death in the U.S., causing more than 400,000 deaths per year. Smoking-related medical expenditures are estimated at over \$75 Billion per year, much of which is paid for by government health care programs such as Medicare and Medicaid.

In its *Healthy People 2010* report, the Department of Health and Human Services set a goal of cutting the prevalence of smoking among U.S. adults in half, from the 1999 level of 24% to 12%. Although policy makers and anti-smoking advocates have focused much of their attention on discouraging youth from beginning to smoke, the rate of smoking cessation among adults will need to rise substantially in order to meet this goal.

Smoking cessation products such as nicotine replacement therapy are one tool to help smokers quit. In fact, it has been shown that smokers are more likely to quit when they use such a product. The cessation product industry's estimated retail sales are nearly \$1 Billion annually and the industry spends \$100 Million to \$200 Million annually on advertising. If the advertisement of these products encourages smokers to quit, and in particular if it encourages some smokers to quit without the use of a cessation product, or "cold turkey," then there are social returns to advertising above and beyond the private profits created by it.

This question is taken up in "**Private Profits and Public Health: Does Advertising Smoking Cessation Products Encourage Smokers to Quit?**" (NBER Working Paper 11938), a new study by **Rosemary Avery, Donald Kenkel, Dean Lillard, and Alan Mathios.**

In their analysis, the authors pay particular attention to the challenge of

identifying a causal impact of advertising on quitting behavior. Their strategy is to link survey data on individual smokers with data on magazine advertisements, which allow them to measure smokers' exposure to cessation product advertisements based on their magazine-reading habits. As the authors note, because they observe the same demographic information about consumers as do advertisers, they can control for the fact that companies may concentrate their marketing in magazines read by groups that are more likely to quit, such as high-income consumers. As they also control for the type of magazines read by the consumer, their strategy essentially relies on the fact that someone who reads *Time* may be exposed to more smoking cessation advertising than someone who reads *Newsweek*.

The authors use data from the Simmons National Consumer Survey, a marketing survey with information on consumers' magazine-reading habits, demographics, and smoking behavior. Pooling surveys from 1995–1999, they have a sample of over 30,000 smokers. They construct the archive of magazine advertisement data over the same period, collecting data from twenty-six magazines that represent between one-third and two-thirds of all magazine circulation in the U.S.

Forty-three percent of the sample report that they attempted to quit smoking within the past year and nine percent report that they do not currently smoke, which the authors use as their measure of quitting. This quit rate is higher than what has been found in other studies, due to the fact that the authors cannot observe subsequent relapses into smoking.

The authors find that exposure to smoking cessation advertising makes smokers both more likely to attempt

to quit and more likely to successfully quit. Interestingly, exposure to advertising increases quit attempts and successful quits both with and without the use of products—in fact, advertising result in a bigger increase in quit attempts without a product than in quit attempts with a product. Thus advertising results in social returns above and beyond private profits because there are positive spillover effects of advertising on to consumers who quit cold turkey.

The authors conduct a back-of-the-envelope calculation to measure the public health benefits from cessation product advertising. They find that an increase in magazine advertising of \$2.6 Million, or 10%, would be likely to generate additional product sales of \$3.3 Million for companies and result in 100,000 additional quitters, or a 0.2 percentage point increase in the smoking cessation rate. The authors point out that this increase in the smoking cessation rate would be expected to lower the smoking prevalence rate over time by 1.2 percentage points, or more than half the observed drop between 1990 and 2000.

Direct-to-consumer advertising in health-related markets is currently a very controversial issue. The authors conclude that in the case of smoking cessation products, there is a case to be made for encouraging companies to increase such advertising, for example by loosening government regulations on advertising, because of the significant public gains.

This research was supported by a grant from the National Cancer Institute (R01 CA094020-01), an award from the Substance Abuse Policy Research Program of the Robert Wood Johnson Foundation to the NBER, and an unrestricted educational grant to Cornell University from the Merck Company Foundation, the philanthropic arm of Merck & Co.

Abstracts of Selected Recent NBER Working Papers

WP 11557.

Ernst R. Berndt, Alisa B. Busch, Richard G. Frank, Sharon Lise-Normand.

Real Output in Mental Health Care During the 1990s.

Health accounts document changes over time in the level and composition of health spending. There has been a continued evolution in the ability to track such outlays. Less rapid has been the ability to interpret changes in spending. In this paper we apply quality adjusted price indexes for several major mental disorders to national mental health account estimates to assess changes in real “output.” We show that using the new price indexes reveals large gains in real output relative to application of BLS indexes.

WP11584

Inas Rashad, Michael Grossman, and Shin-Yi Chou

The Super Size of America: An Economic Estimation of Body Mass Index and Obesity in America

The increased prevalence of obesity in the United States stresses the pressing need for answers as to why this rapid rise has occurred. This paper employs micro-level data from the First, Second, and Third National Health and Nutrition Examination Surveys to determine the effects that various state-level variables have on body mass index and obesity. These variables, which include the per capita number of restaurants, the gasoline tax, the cigarette tax, and clean indoor air laws, display many of the expected effects on obesity and explain a substantial amount of its trend. These findings control for individual-level measures of household income, years of formal schooling completed, and marital status.

WP 11605

Amitabh Chandra and Andrew A. Samwick
Disability Risk and the Value of Disability Insurance

We estimate consumers’ valuation of disability

insurance using a stochastic lifecycle framework in which disability is modeled as permanent, involuntary retirement. We base our probabilities of worklimiting disability on 25 years of data from the Current Population Survey and examine the changes in the disability gradient for different demographic groups over their lifecycle. Our estimates show that a typical consumer would be willing to pay about 5 percent of expected consumption to eliminate the average disability risk faced by current workers. Only about 2 percentage points reflect the impact of disability on expected lifetime earnings; the larger part is attributable to the uncertainty associated with the threat of disablement. We estimate that no more than 20 percent of mean assets accumulated before voluntary retirement are attributable to disability risks measured for any demographic group in our data. Compared to other reductions in expected utility of comparable amounts, such as a reduction in the replacement rate at voluntary retirement or increases in annual income fluctuations, disability risk generates substantially less pre-retirement saving. Because the probability of disablement is small and the average size of the loss—conditional on becoming disabled—is large, disability risk is not effectively insured through precautionary saving.

WP 11677

M. Kate Bundorf, Bradley Herring, and Mark Pauly
Health Risk, Income, and the Purchase of Private Health Insurance

While many believe that an individual’s health plays an important role in both their willingness and ability to obtain health insurance, relatively little agreement exists on how and why health status is likely to affect coverage rates, particularly for individuals purchasing coverage in the individual market. In this paper, we examine the relationship between health risk and the purchase of private health insurance and whether that relationship differs between people pur-

chasing coverage in the individual and large group markets and between low and high income individuals. The data source for our analysis is the panel component of the 1996-2002 Medical Expenditure Panel Survey (MEPS). We find that health risk is positively associated with obtaining private health insurance coverage. The positive relationship between health risk and coverage is stronger for individuals obtaining coverage in the large group market than for individuals obtaining coverage in the individual market. In the large group market, rates of coverage increase more quickly with health risk for low than high income individuals. We conclude that high premiums for high risks are not a significant contributor to the large uninsured population in the U.S. Among low income individuals, high premiums may represent a barrier to low risks in the large group market.

WP11707

Jason R. Barro, Robert S. Huckman, Daniel P. Kessler

The Effects of Cardiac Specialty Hospitals on the Cost and Quality of Medical Care.

The recent rise of specialty hospitals—typically for-profit firms that are at least partially owned by physicians—has led to substantial debate about their effects on the cost and quality of care. Advocates of specialty hospitals claim they improve quality and lower cost; critics contend they concentrate on providing profitable procedures and attracting relatively healthy patients, leaving (predominantly nonprofit) general hospitals with a less-remunerative, sicker patient population. We find support for both sides of this debate. Markets experiencing entry by a cardiac specialty hospital have lower spending for cardiac care without significantly worse clinical outcomes. In markets with a specialty hospital, however, specialty hospitals tend to attract healthier patients and provide higher levels of intensive procedures than general hospitals.

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WP11723

David C. Grabowski, Jonathan Gruber
Moral Hazard in Nursing Home Care.

Nursing home expenditures are a rapidly growing share of national health care spending with the government functioning as the dominant payer of services. Public insurance for nursing home care is tightly targeted on income and assets, which imposes a major tax on savings; moreover, low state reimbursement for Medicaid patients has been shown to lower treatment quality, and bed supply constraints may deny access to needy individuals. However, expanding eligibility, increasing Medicaid reimbursement, or allowing more nursing home bed slots has the potential to induce more nursing home use, increasing the social costs of long term care. A problem in evaluating this tradeoff is that we know remarkably little about the effects of government policy on nursing home utilization. We attempt to address this shortcoming using multiple waves of the National Long-Term Care Survey, matched to changing state Medicaid rules for nursing home care. We find consistent evidence of no effect of Medicaid policies on nursing home utilization, suggesting that demand for nursing home care is relatively inelastic. From a policy perspective, this finding indicates that changes in overall Medicaid generosity will not have large effects on utilization.

WP11724

Tomas J. Philipson, Ernst R. Berndt, Adrian H. B. Gottschalk, Matthew W. Strobeck
Assessing the Safety and Efficacy of the FDA: The Case of the Prescription Drug User Act Fees

The US Food and drug Administration (FDA) is estimated to regulate markets accounting for about 20% of consumer spending in the US. This paper proposes a general methodology to evaluate FDA policies, in general, and the central speed-safety tradeoff it faces, in particular. We apply this methodology to estimate the welfare effects of a major piece of legislation affecting this tradeoff, the Prescription Drug User Fee Acts (PDUFA). We find that PDUFA raised the private surplus of producers, and thus innovative returns, by about \$11 to \$13 billion. Dependent on the market power assumed of producers while having patent protection, we find that PDUFA raised consumer welfare between \$5 to \$19 billion; thus the combined social surplus was raised between \$18 to \$31 billions. Converting these economic gains into equivalent health benefits, we find that the more rapid access of drugs on the market enabled by PDUFA saved the equivalent of 180 to 310 thousand life-years. Additionally, we estimate an upper bound on the adverse ef-

fects of PDUFA based on drugs submitted during PDUFA I/II and subsequently withdrawn for safety reasons, and find that an extreme upper bound of about 56 thousand life-years were lost. We discuss how our general methodology could be used to perform a quantitative and evidence-based evaluation of the desirability of other FDA policies in the future, particularly those affecting the speed-safety tradeoff.

WP11726

Olivia S. Mitchell, Stephen Utkus, Tongxuan Yang
Turning Workers into Savers? Incentives, Liquidity, and Choice in 401(k) Plan Design

We develop a comprehensive model of 401(k) pension design that reflects the complex tax, savings, liquidity and investment incentives of such plans. Using a new dataset on some 500 plans covering nearly 740,000 workers, we show that employer matching contributions have only a modest impact on eliciting additional retirement saving. In the typical 401(k) plan, only 10 percent of non-highly-compensated workers are induced to save more by match incentives; and 30 percent fail to join their plan at all, despite the fact that the company-proffered match would grant them a real return premium of 1-5% above market rates if they contributed. Such indifference to retirement saving incentives cannot be attributed to liquidity or investment constraints. These results underscore the need for alternative approaches beyond matching contributions, if retirement saving is to become broader-based.

WP11796

Sandra E. Black, Paul J. Deveraux, Kjell Salvanes
From the Cradle to the Labor Market? The Effect of Birth Weight on Adult Outcomes.

Lower birth weight babies have worse outcomes, both short-run in terms of one-year mortality rates and longer run in terms of educational attainment and earnings. However, recent research has called into question whether birth weight itself is important or whether it simply reflects other hard-to-measure characteristics. By applying within twin techniques using a unique dataset from Norway, we examine both short-run and long-run outcomes for the same cohorts. We find that birth weight does matter; very small short-run fixed effect estimates can be misleading because longer-run effects on outcomes such as height, IQ, earnings, and education are significant and similar in magnitude to OLS estimates. Our estimates suggest that eliminating birth

weight differences between socio-economic groups would have sizeable effects on the later outcomes of children from poorer families.

WP11810

Tomas J. Philipson, Anupam B. Jena
Who Benefits from New Medical Technologies? Estimates of Consumer and Producer Surplus for HIV/AIDS Drugs

The social value of an innovation is comprised of the value to consumers and the value to innovators. We estimate that for the HIV/AIDS therapies that entered the market from the late 1980s onwards, innovators appropriated only 5% of the social surplus arising from these new technologies. Despite the high annual costs of these drugs to patients, the low share of social surplus going to innovators raises concerns about advocating cost-effectiveness criteria that would further reduce this share, and hence further reduce incentives for innovation.

WP11819

Katherine Ho
The Welfare Effects of Restricted Hospital Choice in the US Medical Care Market

Managed care health insurers in the US restrict their enrollees' choice of hospitals to within specific networks. This paper considers the implications of these restrictions. A three-step econometric model is used to predict consumer preferences over health plans conditional on the hospitals they offer. The results indicate that consumers place a positive and significant weight on their expected utility from the hospital network when choosing plans. A welfare analysis, assuming fixed prices, implies that restricting consumers' choice of hospitals leads to a loss to society of approximately \$1 billion per year across the 43 US markets considered. This figure may be outweighed by the price reductions generated by the restriction.

WP11850

Axel Boersch-Supan, Alexander Ludwig, Joachim Winter
Aging, Pension Reform, and Capital Flows: A Multi-Country Simulations Model.

Population aging and pension reform will have profound effects on international capital markets. First, demographic change alters the time path of aggregate savings within each country. Second this process may be amplified when a pension reform shifts old-age provision towards more pre-funding. Third, while the patterns of population aging are similar in most countries, timing and initial conditions differ substantially. Hence, to the extent that capital is internation-

ally mobile, population aging will induce capital flows between countries. All three effects influence the rate of return to capital and interact with the demand for capital in production and with labor supply. In order to quantify these effects, we develop a computational general equilibrium model. We feed this multi-country overlapping generations model with detailed long-term demographic projections for seven world regions. Our simulations indicate that capital flows from fast-aging regions to the rest of the world will initially be substantial but that trends are reversed when households decumulate savings. We also conclude that closed-economy models of pension reform miss quantitatively important effects of international capital mobility.

WP11871

Harsha Thirumurthy, Joshua Graff-Zivin, Markus Goldstein

The Economic Impact of AIDS Treatment: Labor Supply in Western Kenya

Using longitudinal survey data collected in collaboration with a treatment program, this paper is the first to estimate the economic impacts of antiretroviral treatment in Africa. The responses in two important outcomes are studied: (1) labor supply of adult AIDS patients receiving treatment; and (2) labor supply of children and adults living in the patients' households. We find that within six months after the initiation of treatment, there is a 20 percent increase in the labor force and a 35 percent increase in weekly hours worked. Since patient health would continue to decline without treatment, these labor supply responses are underestimates of the impact of treatment on the treated. The upper bound of the treatment impact, which is based on plausible assumptions about the counterfactual, is considerably larger

and also implies that the wage benefit from treatment is roughly equal to the costs of treatment provision. The responses in the labor supply of patients' household members are heterogeneous. Young boys and women work considerably less after initiation of treatment, while girls and men do not change their labor supply. The effects on child labor are particularly important since they suggest potential schooling impacts from treatment.

WP11875

John A. Verson and W. Keener Hughen
The Future of Drug Development: The Economics of Pharmacogenomics.

This paper models how the evolving field of pharmacogenomics (PG), which is the science of using genomic markers to predict drug response, may impact drug development times, attrition rates, costs, and the future returns to research and development (R&D). While there still remains an abundance of uncertainty around how PG will impact the future landscape of pharmaceutical and biological R&D, we identify several likely outcomes. We conclude PG has the potential to significantly reduce both expected drug development costs (via higher probabilities of technical success, shorter clinical development times, and smaller clinical trials) and returns. The impact PG has on expected returns is partially mitigated by higher equilibrium prices, expedited product launches, and longer effective patent lives. Our conclusions are, of course, accompanied by numerous caveats.

WP11877

Peter Diamond
Pensions for an Aging Population

After presenting the Gruber-Wise analysis

showing a strong effect on retirement of implicit taxes from pension rules, it is shown that there is no effect of these implicit taxes on unemployment. This supports the argument for avoiding high implicit taxes on continued work. Also discussed are methods for adjusting benefits and taxes for increases in life expectancy, with particular attention to increasing "the retirement age." Calculations are presented showing the decreases in benefits for an increase in the normal retirement age in the US and the years of service for a full benefit in France.

WP11920

John Beshears, James J. Choi, David Laibson, Brigitte Madrian.
Early Decisions: A Regulatory Framework.

We propose a regulatory framework that helps consumers who have difficulty sticking to their own long-run plans. Early Decision regulations help long-run preferences prevail by allowing consumers to partially commit to their long-run goals, making it harder for a momentary impulse to reverse past decisions. In the cigarette market, examples of Early Decision regulations include restricting the locations or times at which cigarettes are sold, delaying the receipt of cigarettes following purchase, and allowing a consumer to choose in advance the legal restrictions on her own cigarette purchases. A formal model of Early Decision regulations demonstrates that Early Decisions are optimal when consumer preferences are heterogeneous. Intuitively, each consumer knows his own preferences, so self-rationing—which is what Early Decisions enable—is better than a one-size-fits-all regulation like a sin tax. Of course, Early Decision regulations incur social costs and therefore require empirical evaluation to determine their net social value.

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