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Health Care Spending: Historical Trends and New Directions

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health insurance, technology, medical expenditures, managed care

Abstract

Over the past five decades, broad changes in the US health care system have dramatically influenced growth in health care expenditures. This review identifies the salient factors driving the growth of medical expenditures and how they influenced the trajectory of health economics research. We find that the research identified—and was strongly influenced by—four eras of expenditure growth: period 1, coverage expansion; period 2, experimentation with financial incentives; period 3, the managed care backlash; and period 4, a golden era of declining expenditure growth. We conclude by discussing some themes from this research suggesting optimism that, going forward, we can curb excess expenditure growth above GDP growth without harming population health.

1. INTRODUCTION

Unlike any other country in the world, the United States spends almost 19% of its income on health care.[1] Part of the reason, of course, is that it is one of the richest nations. However, even after adjusting for GDP, the United States remains a clear outlier. **Figure 1** depicts the relationship between per capita health spending and per capita GDP among 33 OECD countries.[2] Excluding

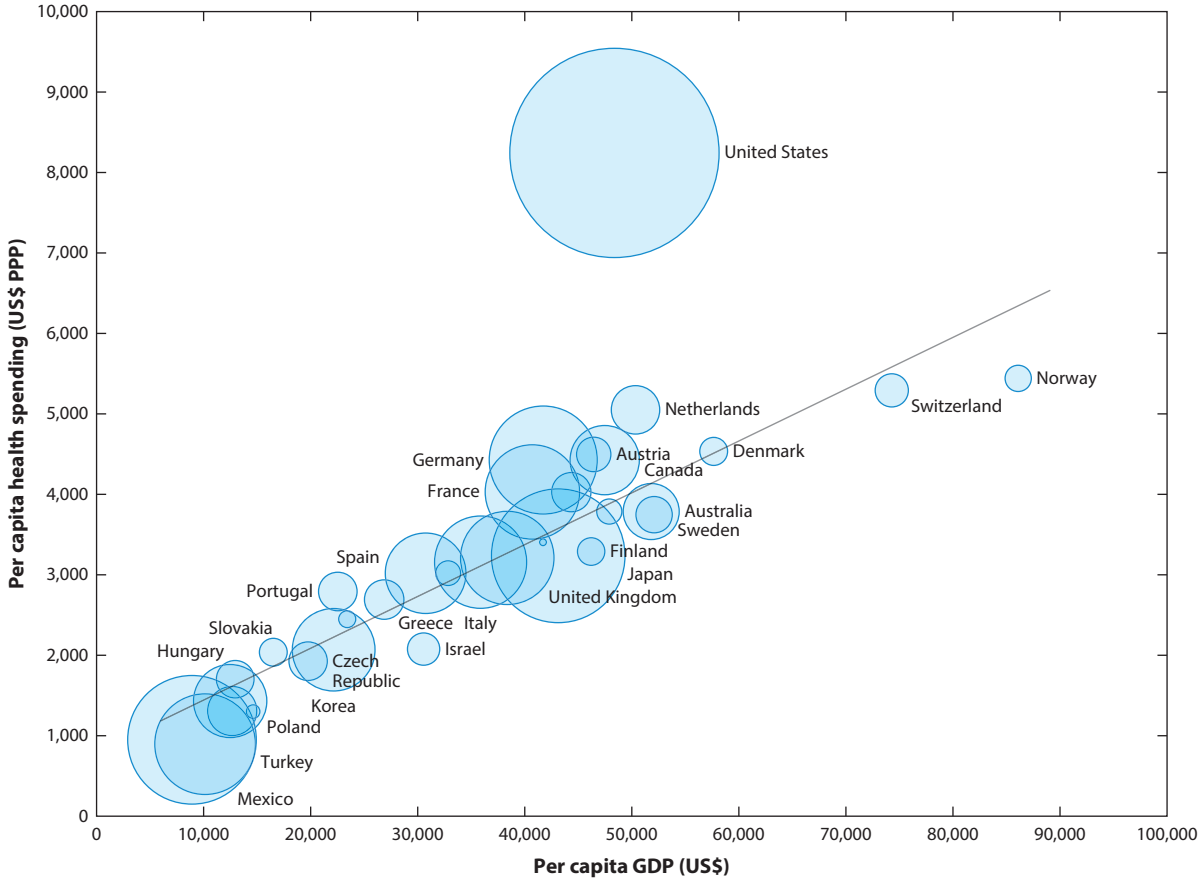

Figure 1

Cross-country per capita health spending relative to GDP, 2010. Per capita health expenditures are from the OECD Stats Extract, per capita GDP are from the World Bank's World Development Indicators, and population data are from the World Health Organization's Global Health Observatory Data Repository. Circle sizes represent the population count. The line is a fitted linear line that excludes the United States. All OECD countries, except for Luxembourg, are shown. Only selected countries are labeled, and each label is placed outside of the circle to which it refers. Abbreviation: PPP, purchasing power parity.

[1] Official estimates of health spending in the United States are provided by the Centers for Medicare and Medicaid Services' National Health Expenditure Accounts. Over 80% of health care spending is attributed to health care services or goods. Services are provided by physicians, other medical professionals, dentists, home health care agencies, nursing homes, and hospitals; goods include prescription drugs, other nondurable medical products, and durable medical equipment. Also included are expenditures on public health activities, government administration, the net cost of health insurance, and investments related to health care research.

[2] Luxembourg is omitted from this list.

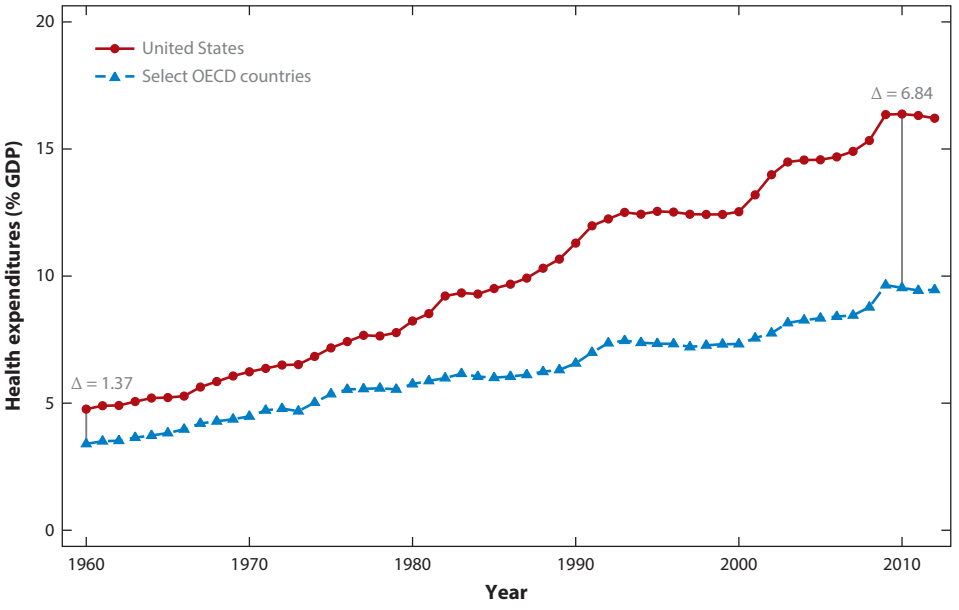

Figure 2

Real health expenditures as a percent of GDP, 1960–2013. Data are from the OECD Health Statistics. "Select OECD Countries" is a population-weighted average of data from Austria, Canada, Finland, Ireland, Spain, Switzerland, and the United Kingdom. The other excluded OECD countries do not have available historical data from 1960. Trends from 1990 onward using all OECD countries are similar to those shown in the figure.

the United States, the GDP to health expenditure ratio is remarkably linear. Using the trend line for these other countries, one would expect the United States to spend 7.7% of its GDP on health care, 9.3 percentage points less than actual spending.[3] This health expenditure differential has almost always existed, and it has only grown larger over time. **Figure 2** shows that in 1960, the United States spent 1.4 percentage points more of its GDP on health relative to seven other OECD countries. By 2010, this differential had nearly quintupled to 6.8 percentage points.

However, US health care expenditure growth over the past 50 years has not been steady. An examination of annual growth rates of real health expenditures over this period, as shown in **Figure 3**, suggests that growth can be divided into four major eras. The first period, from 1960 to 1973, saw rapid expenditure growth. During this period of expansion, access to health insurance increased, cost sharing fell, and demand grew, as one would expect as prices fell. This effect was also spurred on by rapid but costly technological innovation (e.g., Newhouse 1992). The second era, from 1973 to 1995, is one in which the health expenditure growth rate fell, rose, and fell again. The volatility of health expenditures in this period can be attributed to policy experimentation in provider reimbursement and new benefit designs. Managed care plans skyrocketed in popularity, but by the mid- to late 1990s, interest in managed care fell almost as quickly as it rose. The backlash against managed care contributed to the steady rise in expenditure growth from 1995 to 2002. In 2002, the expenditure growth rate changed course yet again, and this time, its steady 10-year decline culminated in the lowest levels of spending growth since 1960. During this

[3]These figures are based on the authors' calculations using 2010 data from the World Bank's World Development Indicators.

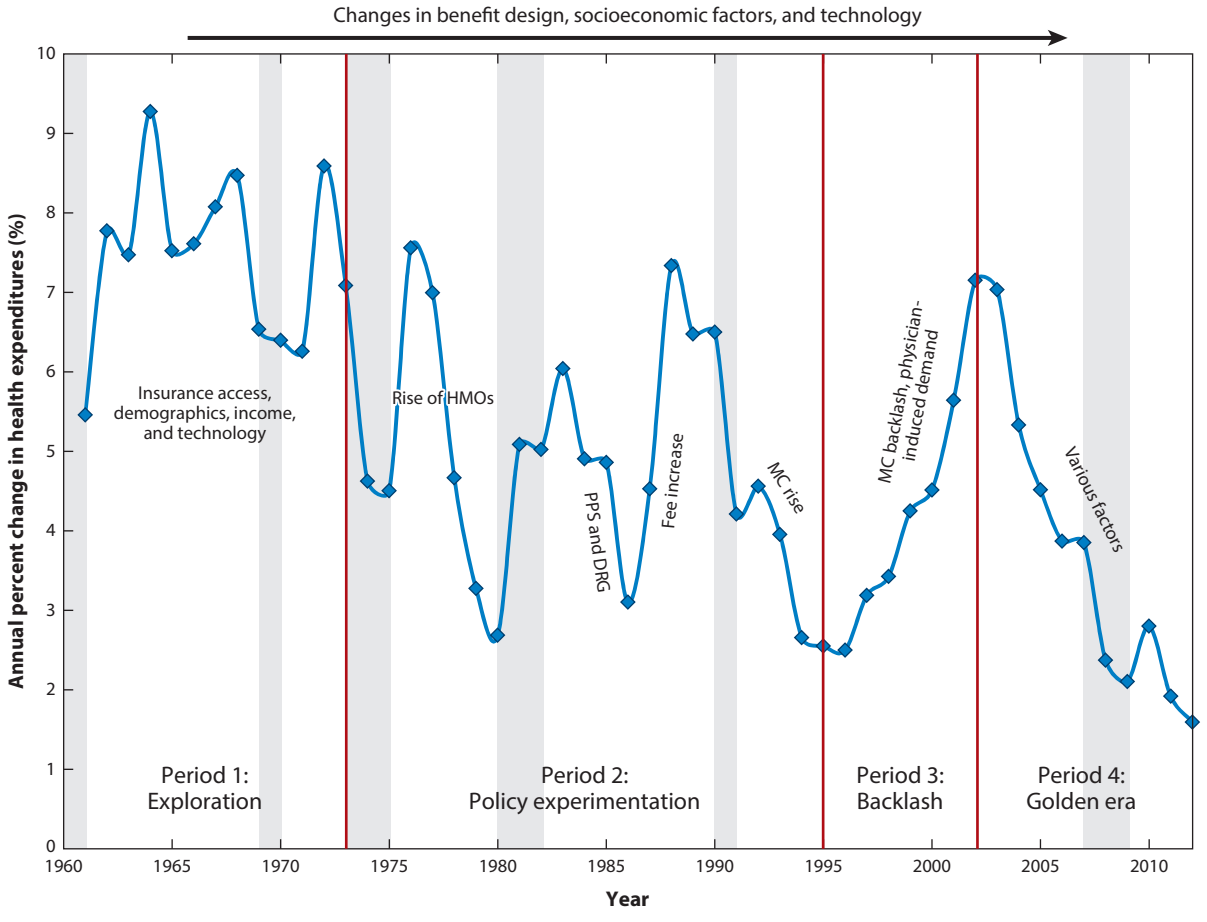

Figure 3

Annual percent change in real health expenditures, 1960–2013. Data on total annual health spending are from the National Health Expenditure Accounts. All health spending values are converted to 2010 US dollars using the US Bureau of Labor Statistics' Consumer Price Index for all urban consumers. Gray bars represent macroeconomic recessions as identified by the National Bureau of Economic Research. Changes in benefit design, socioeconomic factors, and technology play a key role throughout this time period. In period 1, the general increase in health expenditure growth can be attributed to increased insurance access, higher income, an aging population, and technological improvements. In period 2, changes in health expenditures were driven by the rise of health maintenance organizations (HMOs), the introduction of Medicare's prospective payment system (PPS), the establishment of diagnosis-related groups (DRGs), Medicare's fee increases, and the rise of managed care (MC). In period 3, there was backlash against the MC system, and several studies began to investigate the idea of physician-induced demand. In period 4, various factors discussed in Section 5 contributed to the slowing of health expenditure growth.

so-called golden era of declining expenditure growth, the Congressional Budget Office (CBO) reduced—every year between 2006 and 2014—its estimate of how much the federal government would need to spend on Medicare over a projected ten year period (Sanger-Katz & Quealy 2014).

In this article, we review the dominant factors responsible for the observed changes in the health expenditure growth rate over time. These factors have heavily influenced the trajectory of health economics research, and they inform the direction for not only future research, but also future policy. For each factor, we discuss the literature's most-cited works, many of which are listed in **Tables 1** and **2**. Certain factors, such as benefit design, socioeconomic factors, and

Table 1 Most-cited studies pertaining to persistent trends or trends specific to 1960–1994 (periods 1 and 2)

Paper	Study period	Number of citations
Period 1: exploration, 1960–1973, and continuing trends		
Access to insurance		
Manning et al. (1987)	1974–1977	1,965
Pauly (1968)[a]	1968	1,662
Pauly (1974)[a]	1974	735
Goldman et al. (2007)	1985–2006	478
Technology and quality of care		
Newhouse (1992)	1950–1990	1,168
Fisher et al. (2003a)	1993–1995	1,270
Fisher et al. (2003b)	1993–1995	1,065
Weisbrod (1991)	1940–1990	835
Cutler & McClellan (2001)	1984–1998	783
Hall & Jones (2007)	1950–2000	503
Cutler et al. (2006)	1960–2000	323
Socioeconomic factors		
Finkelstein et al. (2009)	1998–2006	1,676
Hoffman et al. (1996)	1987–1990	1,044
Schneider & Guralnik (1990)	1976–1987	774
Newhouse (1977)	1968–1973	693
Spillman & Lubitz (2000)	1974–1996	376
Lakdawalla et al. (2004)	1984–2000	239
Period 2: policy experimentation, 1973–1995		
PPS and Medicare DRG		
Coulam & Gaumer (1992)	1983–1988	223
HMOs, other managed care arrangements, and technology		
Miller & Luft (1994)	1980–1993	798
Miller & Luft (1997)	1986–1997	533
Woolhandler & Himmelstein (1991)	1987–1988	437
Glied (2000)	1980–1993	340
Physician-induced demand		
McGuire (2000)[a]	2000	714
Ellis & McGuire (1993)	1984–1990	333
Cromwell & Mitchell (1986)	1969–1976	258
Rice (1983)	1976–1978	238

In each category, we list the most highly cited papers that pertain to explaining health expenditure trends over time. We consider only studies with (*a*) at least 200 citations, (*b*) empirical analyses or publication dates during the time periods specified in each column heading, and (*c*) more citations than other papers within a broad topic area. Citation counts from Google Scholar are recorded as of August 1, 2015. Abbreviations: DRG, diagnosis-related group; HMO, health maintenance organization; PPS, prospective payment system.

[a]Theoretical study.

Table 2 Most-cited studies pertaining to trends specific to 1995–2013 (periods 3 and 4)

Paper	Study period	Number of citations
Period 3: backlash, 1995—2002		
Managed care backlash		
Robinson (2001)[a]	2001	279
Blendon et al. (1998)	1995–1997	267
Period 4: golden era, 2002–2015		
Recession, Medicare, efficiency, and technology		
Catlin et al. (2008)	2000–2006	202
Truffer et al. (2010)	2007–2009	180
Sisko et al. (2009)	1993–2008	147
Martin et al. (2014)	2002–2009	107
Chernew et al. (2009)	2003–2007	74
Cutler & Sahni (2013)	2007–2012	39
Ryu et al. (2013)	2009–2011	33
Holahan & McMorrow (2013)	2000–2010	4

In each category, we list the most highly cited papers that pertain to explaining health expenditure trends over time. We consider only studies with (*a*) at least 200 citations, (*b*) empirical analyses or publication dates during the time periods specified in each column heading, and (*c*) more citations than other papers within a broad topic area. In the more recent period from 2002 to 2013, we relax the constraint that studies need to have at least 200 citations, and we focus on US-specific analyses. Citation counts from Google Scholar are recorded as of August 1, 2015.
[a]Descriptive study.

technology, have played a continuous role in shaping health expenditures throughout the past five decades. We introduce those topics at length when discussing the first period and revisit them in subsequent periods. We conclude by considering the innovations in health care structure and delivery that continue to shape the US health care system.

2. PERIOD 1: COVERAGE EXPANSION, 1960–1973

From 1960 to 1973, the growth rate of health expenditures remained high and often trended upward. During this period, health expenditures, expressed in 2010 US dollars, rose from less than $992 per capita in 1960 to over $2,132 per capita in 1973. Although part of this growth can be attributed to an increase in personal wealth, real GDP per capita increased by 1.5 times, whereas real health expenditures per capita increased by 2.2 times. In addition to an expanding economy, the prevalence of employer-sponsored health insurance rose, contributing to a higher uptake of insurance, improved access to care, and reduced patient cost sharing. These changes enabled more people to afford the groundbreaking, yet expensive, medical innovations that were extending life expectancy and creating a growing aging population.

2.1. The Spread of Health Insurance

Due to an increasing demand for health care, improvements in medical techniques and technology, and rising medical fees, the 1930s saw a surge of public interest in health insurance. Hospitals, which had traditionally limited themselves to providing care, responded by organizing methods for local associations to prepay for services rendered to the community. These prepaid plans—eventually combined under the auspices of the American Hospital Association and entitled the Blue

Cross plans—proliferated across the country, enrolling approximately 20% of the population by 1947 (Reed 1947). Observing the success of the Blue Cross plans, commercial insurance companies quickly followed suit, and by the early 1950s, enrollment in commercial policies had overtaken enrollment in Blue Cross plans (Thomasson 2004). Throughout this period, employers played an important role in the provision of and demand for health insurance.

Federal legislation enacted from the late 1930s through the 1950s helped spur the spread of employer-sponsored health insurance. To address inflationary pressures created by the shortage of labor during World War II, President Franklin Roosevelt established a number of agencies, such as the National War Labor Board, to control wages. The wage restrictions in the early 1940s led to an increase of fringe benefits, including health insurance, among employers who needed to attract labor (Schumann 2003). In 1943, the Internal Revenue Service issued a special ruling confirming that employees were not required to pay tax on the dollar value of group health insurance premiums paid on their behalf by their corporate employers. However, the full scope of the tax exclusion remained uncertain due to a number of rulings and court decisions throughout the 1940s. Any uncertainty was clarified by the Internal Revenue Code of 1954, which codified the exclusion of employer contributions toward employee health benefits (Morris 1954). This legislation cemented the prevalence of employer-sponsored health insurance in the United States. To this day, the preferential tax treatment of health benefits is one of the largest tax expenditures in the US budget; in 2013, the exclusion of income and payroll taxes from employer and employee contributions totaled in excess of $250 billion in foregone tax revenue (Rae et al. 2014).

By 1960, 68% of the population carried health insurance. However, Congress and President Lyndon Johnson were concerned that low-income and elderly people had trouble obtaining affordable health insurance and paying for health care, so they created Medicaid and Medicare in 1965. Medicaid, known then as Title XIX, provided federal matching funds for states to finance the health care of individuals who were at or close to the public assistance level. Conversely, Medicare provided virtually universal public health insurance to individuals aged 65 and older. Medicare Part A provided coverage for up to 90 days of inpatient hospital expenses after an initial deductible, with 25% coinsurance for days 61–90. Through Part B, individuals received supplementary coverage of physician services, and they were responsible for a 20% coinsurance. Both programs were intended to integrate care into the mainstream, a goal that was ultimately successful for Medicare—in part due to its universality for the elderly—but not for Medicaid.

As take-up of both public and private insurance grew, economists began to recognize the potential to overconsume health care services. In seminal papers, Pauly (1968) notes that insurance distorts the price paid by consumers, and Pauly (1974) demonstrates that there will be overinsurance in the presence of imperfect information. Feldstein & Friedman (1977) provide further insight by modeling demand for health insurance, with the important finding that the tax subsidy for health insurance enshrined in the Internal Revenue Code of 1954 substantially increases health insurance demand. This research led to a crucial insight that would guide health economics to this day: Insurance reduces the price to the consumer (cost sharing), which can lead to increased utilization. When consumers with health insurance demand more care than they would have at normal market prices, the value of their care is less than the market price (Holmstrom 1979). The difference between the cost to produce care and the lowered value of care to insured consumers represents an inefficiency that generates welfare loss.

Although this may seem tautological today, the notion that health care use responds to price was hardly well established in 1970. This motivated one of the best experimental social science studies ever conducted: the RAND Health Insurance Experiment carried out from 1974 to 1982. The experiment sought to identify the effects of health insurance on utilization, costs, and overall health. It randomly assigned families to either a prepaid group practice or one of 14 fee-for-service

FFS: fee for service

(FFS) insurance plans, demonstrating that families in the least generous plans spent at least 30% less on medical care. This responsiveness to price was present in both the outpatient and inpatient care settings, yet—despite the big difference in utilization—there was little or no difference in general health (Manning et al. 1988).

Decades of research have built upon the findings of the RAND study. Most recently, the Oregon Health Insurance Experiment stands out as another landmark study using a randomized control design. Randomizing Medicaid coverage for a group of uninsured low-income individuals, Baicker et al. (2013), Finkelstein et al. (2012), and Taubman et al. (2014) show that Medicaid insurance increases health care utilization, reduces financial strain, and reduces depression. They find no statistically significant effects on physical health or labor market outcomes. While the covered populations in the RAND and Oregon experiments differ significantly—RAND considering the representative, nonelderly population and Oregon focusing on low-income adults with no insurance—both studies find that insurance coverage is associated with increased spending, increased annual outpatient visits, and minimal to no effects on physical health: a surprising result given the approximately 30-year interregnum between the studies. They do differ on their findings of mental health; whereas the RAND study finds no evidence of an impact on mental health, the Oregon study detects a 30% reduction in depression.

Abstracting from the impacts of insurance on health outcomes and focusing on the replication of spending elasticities, some quasi-experimental studies and many nonexperimental studies provide similar evidence. For example, researchers have used the Massachusetts health reform for universal coverage and the age 65 Medicare cutoff as sources of exogenous variation in insurance coverage (e.g., Card et al. 2008, Kolstad & Kowalski 2012). After surveying 923 articles, Goldman et al. (2007) conclude that increased cost sharing is associated with lower rates of drug treatment, worse adherence among existing users, and more frequent discontinuation of therapy. We note that much of the nonexperimental work utilizes geographic variation in cost sharing, such as state-level changes in Medicaid (e.g., Reeder & Nelson 1985, Stuart & Zacker 1999). Finkelstein (2007) uses geographic variation in private health insurance coverage prior to Medicare's introduction. She finds that the overall spread of health insurance between 1950 and 1990 may be able to explain about half of the increase in real per capita health spending over that time period. The bottom line from all this research is that we know coverage expansions—in terms of both new insurance and more generous insurance—can explain much of the growth of health care spending during this period. In 1960, out-of-pocket spending constituted 47% of total health expenditures, and only 67% of people had health insurance. By 1974, out-of-pocket spending constituted less than 30% of total health expenditures, and over 86% of people had health insurance (Cohen et al. 2009).

2.2. Technology and Quality

Health insurance was not the only factor changing over this period. On the supply side, expensive new technologies were also entering clinical practice. Between 1960 and the late 1970s, important innovations included major pharmaceuticals, for example, diuretics (1958); beta blockers (1962); and vaccinations for measles (1963), mumps (1967), and meningitis (1978). Biotechnology engineers also developed mammography imaging (1974), computerized tomography scans (1975), and ultrasounds (1978), and these were quickly adopted into routine patient care. Providers performed the first liver (1962), lung (1963), and heart (1967) transplants and experimented with techniques such as gene splicing (1973) and in vitro fertilization (1978).

The development and diffusion of medical technology are subjects that are near and dear to health economics. Hall & Jones (2007) argue that health technology is a consequence of income growth. They use an expected lifetime utility framework to show that expensive medical

technologies are valued because of the rising value of life. In their model, a social planner chooses the consumption and health spending for a representative individual so that the individual's utility is maximized subject to resource and health production constraints. As future mortality declines, the value of life and the marginal benefit of health spending increase, shifting total spending toward health.

Empirically, measuring the contribution of technology to health expenditure growth has been difficult as technological change and the demand for health insurance are highly interdependent (Weisbrod 1991). When previously untreatable conditions become treatable, individuals become more susceptible to higher and more variable health care costs, and they thereby enhance the demand for insurance and increasing utilization. Some researchers have attempted to disentangle the role of technology from utilization. For example, Newhouse (1992) notes that from 1950 to 1990, hospital admission rates and lengths of stay did not increase. However, the real cost of a day in the hospital quadrupled, suggesting that technology, as opposed to utilization, drove medical care costs.

More and better technology, and the attendant higher spending, may not be indicative of improved quality of life, increased longevity, or less time away from work (Fisher et al. 2003a,b). The value of technology depends on how it affects the medical system (Cutler & McClellan 2001). Some technologies allow for the treatment of previously untreatable diseases. Because they expand the treatment possibility frontier, those technologies are generally cost increasing, and their worth will depend on how valuable they are to the marginal patient. Other technologies act as substitutes for older therapies. Replacement therapies are not necessarily cost increasing, but their effectiveness may also vary. Cutler & McClellan (2001) analyze five conditions: heart attacks, low birth weight in infants, depression, cataracts, and breast cancer. They find that in most cases, technological innovations in medicine led to net positive returns, but in the case of breast cancer, the slight improvement in outcomes is roughly counterbalanced by the substantial increase in costs. Others use randomized, placebo-controlled trials to identify the returns of technology. For example, Moseley et al. (2002) demonstrate the ineffectiveness of arthroscopic surgeries for patients with osteoporosis, and Temel et al. (2010) show that palliative care can lead to longer survival relative to chemotherapy for patients with terminal lung cancer.

These studies highlight the importance of assessing the appropriateness of medical technology use. Although randomized clinical trials offer a gold standard for identifying the effectiveness of medical technologies, they are often time-consuming, expensive, and particular to a narrowly defined group of patients. Proposed by Brook et al. (1986), an alternative is to synthesize expert opinions by surveying panelists and categorizing their ratings. Differences among panelists can indicate evenly balanced benefits and risks of doing a procedure or disagreements over what the benefits and risks are. Regardless of the source of controversy, disagreements can account for many of the observed differences in medical spending across the country. Phelps & Mooney (1993) find that disagreements among physicians and their patients account for more of the observed variation in health spending than differences in socioeconomic factors. Baicker & Chandra (2004) conclude that states with higher Medicare spending have lower quality of care, perhaps because costly, intensive care crowds out the use of more effective care, and Finkelstein et al. (2014) show that supply-side differences may also account for up to 50–60% of the geographic variation in health care utilization.

2.3. Socioeconomic Factors

Even absent technological change, health expenditures will rise due to the changing demographics in the United States. Over the past five decades, the average American has become richer, more educated, and older. The effects of income are well established: When income increases, the

demand for both health insurance and health care increases. Liu & Chollet (2006) review the literature, and they conclude that the income elasticity of demand for health insurance is approximately 0.1. Although this elasticity is small, changes in income have a larger effect on the type and generosity of health plan chosen, as opposed to the decision to purchase insurance on the extensive margin (Ringel et al. 2002). Based on results from the RAND Health Insurance Experiment, researchers have found that the income demand for health has an elasticity of 0.2 or less, confirming that health care is a normal good (Keeler et al. 1988). Other studies that use time-series or aggregated state- or county-level data have produced higher estimates, ranging from 0.2 to 1.5. The greater sensitivity observed through longer time series data results in part from the rapid technical change that occurs over time. As real income increases, the aggregate demand for new medical technology increases and innovation accelerates, altering patterns of health care use. As **Figure 1** suggests, income elasticities in other countries are higher, and cross-national studies have estimated income elasticities ranging from 1.15 to 1.31 (e.g., Newhouse 1977).

When one is relying on income elasticities to forecast changes in demand, it is worth noting that few studies observe exogenous changes in patient income. Because nearly all studies use observational data, these elasticities are measured as differences in demand attributable to differences, rather than changes, in income. Furthermore, the income elasticity may depend greatly on the service considered: Certain services are necessities and will be fairly income inelastic. Other services, such as cosmetic surgery, are discretionary and may be quite income elastic.

The link between education and the demand for health services is more nuanced but perhaps even more important. As Grossman (2000) explains, the theoretical relationship between education and health demand is unclear. Education makes a person more efficient in producing health, so the quantity of health care required to achieve a given health stock is lowered. At the same time, education increases the demand for health, so the overall relationship between education and health depends on the increased productivity of inputs relative to the outward shift in demand for health care.

There is a well-established positive correlation between education and health, but identifying a causal relationship—and understanding why it is exists—has proven more elusive. Cutler & Lleras-Muney (2008) review the literature. Relying on studies that use quasi-experimental variation on schooling policies, they conclude that part of the correlation between education and health is causal. Causal evidence comes from studies using variation in compulsory schooling laws and the availability of colleges. Although these natural experiments measure changes in the quantity of education, they rely on policies affecting individuals whose return to schooling is likely different from the average returns of the population. As such, it is not possible to use the results of these studies to quantify how much of the observed correlation between education and health in the general population can be accounted for by reverse causality or by a third factor. Partial explanations for the relationship between education and health include the higher educated having higher income, greater access to health care, better labor market outcomes that provide health insurance and safer working environments, and a heightened sense of control and self-esteem through having a higher rank in society. More tenuous explanations include the higher educated placing higher valuations on future life years, engaging in less risky behavior, having access to more health-related information, having better critical thinking skills, and having wider social networks.

Coupled with medical innovations, higher income and more education lead to improvements in health that generate large increases in longevity. In 1960, the average life expectancy at birth was 69.7 years. By 1980, it was 73.7 years, and by 2010, it had reached 78.7 years (Natl. Cent. Health Stat. 2011). The cumulative gains in life expectancy from 1970 and 2000 have added approximately $3.2 trillion per year to national wealth, equal to about half of GDP, and reduced

Table 3 Ten largest declines in the annual health expenditure growth rate from 1960 to 2013

Rank	Years	Change in growth rate (%)	Period	Recession?
1	1973–1974	−2.46	2: policy experimentation	Yes
2	1977–1978	−2.33	2: policy experimentation	No
3	1990–1991	−2.29	2: policy experimentation	Yes
4	1968–1969	−1.94	1: exploration	No
5	1985–1986	−1.76	2: policy experimentation	No
6	1964–1965	−1.75	1: exploration	No
7	2003–2004	−1.70	4: golden era	No
8	1972–1973	−1.51	1: exploration	No
9	2007–2008	−1.48	4: golden era	Yes
10	1978–1979	−1.39	2: policy experimentation	No

Data taken from the National Health Expenditure Accounts.

age-specific mortality rates have mitigated expenditure growth prior to end-of-life care (Murphy & Topel 2006).[4] However, at the same time, a growing aging population has increased health expenditures. Cutler et al. (2006) show that the incremental costs per year of life gained have increased disproportionately for those ages 65 and over, due in part to the increased utilization of Medicare-covered home health care and hospice services. Even though the reliance on nonhospital services has grown, the use of hospital services at the end of life has not slowed appreciably. Assuming constant spending per age, Newhouse (1992) estimates that the changing population of those over 65 accounts for about 15% of the increase in total spending in the late 1980s. Spillman & Lubitz (2000) further demonstrate that both total expenditures from age 65 to death and spending in the last two years of life increase with longevity.

3. PERIOD 2: POLICY EXPERIMENTATION, 1973–1995

Between 1973 and 1995, the health expenditure growth rate became particularly volatile, a pattern that may be explained by innovation in insurance contracts and financial incentives. **Table 3** lists the ten largest declines in the annual real health expenditure growth rate from 1960 to 2013. Significantly, four of the five largest declines in the real health expenditure growth rate occurred during this experimentation period. The period began with an increased prevalence of health maintenance organizations (HMOs), continued with changes to the Medicare payment system, and ended with the rise of managed care. We discuss payment changes in Section 3.1, examine HMOs and other managed care arrangements in Section 3.2, and consider administrative costs and physician-induced demand in Section 3.3.

HMO: health maintenance organization

[4]Murphy & Topel (2006) arrive at the $3.2 trillion valuation by using an economic framework in which individuals maximize lifetime expected utility. They assume that health-related knowledge affects quality of life over the life cycle and apply a value of statistical life of $6.3 million for individuals between ages 25 and 55.

3.1. Medicare Payment Reform

PPS: prospective payment system

DRG: diagnosis-related group

During the period of experimentation, Medicare payments changed significantly. Most notably, Medicare revamped its reimbursement system for hospitals, and payment rates for all providers fluctuated through a series of legislative changes.

3.1.1. The prospective payment system. As seen from **Figure 3**, a decline in the real health expenditure growth rate occurred from 1983 to 1986. This decline aligns closely with the passage of the Social Security Amendments of 1983, which officially established an inpatient hospital prospective payment system (PPS) for the Medicare program. Under the PPS, hospitals are reimbursed at a predetermined rate per inpatient admission, regardless of actual services administered. Clinical information is used to classify each patient into a diagnosis-related group (DRG), and each DRG has a payment weight associated with it. The weights are based on the average resources needed to treat a Medicare patient with a specific diagnosis. In theory, the PPS incentivizes hospitals to use resources efficiently, especially if a given provider tends to incur higher than average costs. The extensive empirical literature supports this theory, and Coulam & Gaumer (1992) provide a comprehensive review.

Financially, the evidence points to reductions in total margins and a slower rate of increase of hospital expenditures (Feder et al. 1987, Hadley et al. 1989). The reduced hospital expenditures can be attributed to a slowdown in the increase in wages per hour; improved labor productivity; and moderate, short-lived reductions in the length of stay (e.g., Cromwell & Pope 1989, Long et al. 1987). The PPS also shifted the setting in which care is administered. Physicians shifted a share of their surgical procedures from the inpatient setting to the outpatient setting, where payments were made according to an FFS model (DesHarnais et al. 1988, Sloan et al. 1988). Hospitals also increased the proportion of patients they discharged to home health agencies (e.g., Long et al. 1987). In theory, discharges to skilled nursing facilities should also have increased, but the empirical evidence is mixed. The conflicting findings likely result from concurrent changes in coverage and payment policies for skilled nursing facilities during this period.

Although the PPS appears to have lowered costs, that reduction can come at the expense of cost-shifting, cream-skimming behavior, or lower quality of care. Reimbursements are benchmarked to the cost of treating the average patient, so in theory, the PPS can encourage hospitals to avoid treating the sicker, costlier patients. It can also encourage hospitals to discharge patients as early as possible, regardless of potential increases in health risk. However, there are no clear empirical documentations of these adverse behaviors. Prices to third-party payers did not increase, suggesting that hospitals did not shift Medicare PPS shortfalls to private payers (Hadley & Zuckerman 1990, Zuckerman & Holahan 1988). Mortality statistics and remission rates did not change substantially, and transfers, which allow for the "dumping" of sicker patients to other hospitals, also did not change (e.g., Kahn et al. 1990, Sloan et al. 1988).

There is stronger evidence that the PPS encouraged upcoding or DRG creep, which refers to the manipulation of diagnostic coding to maximize reimbursements. Identifying DRG creep is difficult because some changes in case mix are related to true changes in the resources needed to care for sicker patients (e.g., Ginsburg & Carter 1986). Each year, the Center for Medicare and Medicaid Services, formerly known as the Health Care Financing Administration (HCFA), uses data on the average hospital costs to recalibrate weights for DRGs. Therefore, an increase in DRG weights can indicate either upcoding or simply the need to perform more complex, technologically intensive procedures that cannot be conducted outside of a hospital. Two studies overcome these empirical challenges. Carter et al. (1990) exploit data from a private firm that independently recoded DRGs for a random sample of hospital charts. They find that between

1986 and 1987, about two-thirds of the changes in DRG payments reflect actual changes in the complexity of cases, whereas the rest can be attributed to changes in coding practice. Dafny (2005) utilizes an exogenous increase shock to certain DRG codes to identify the tendency to upcode. In 1987, HCFA eliminated several DRG codes and recalibrated the DRG weights. The recalibration created differential price changes among highly substitutable pairs of DRG codes. Dafny finds that hospitals respond primarily by upcoding patients to diagnosis codes with the largest price increases.

HCFA: Health Care Financing Administration

Despite the wealth of studies looking at the PPS, several empirical constraints limit our understanding of the potential effectiveness of the PPS as a cost-containment strategy. First, the national adoption of the PPS lends itself to a pre- and post-PPS study, but such an approach cannot disentangle the impact of the PPS from temporal confounding factors (Giacalone 2001, Lohr 1990). For example, the increasing adoption of technology favored the use of outpatient care. The rise of managed care programs contributed to cost reductions, and the liberalization of home health agencies from restrictive Medicare rules increased the appeal of home health care. The 1986 amendments to the conditions of participation, which laid forth new quality assurance standards for hospitals, also likely dampened potential quality reductions from moving to the PPS. Second, many studies focus on only the first three to four years following PPS implementation, so behavioral changes are limited to short-run observations. Third, it is widely conceded that in the first year of the PPS, the "overpayment" created margins that were aberrant, making the short study windows even more limiting. Nevertheless, policy makers consider the PPS to be a successful method of containing costs, and the system was later implemented for Medicaid and Medicare reimbursements in skilled nursing facilities in 1997 and home health agencies and Federally Qualified Health Centers in 2000.

3.1.2. The 1985 and 1987 legislative changes. From 1986 to 1988, the health expenditure growth rate once again began to climb. The literature examining this brief rise remains scant. However, it is likely not coincidental that the three health service groups with the largest expenditure growth rates in this period—Medicare services, home health services, and other professional services—are those that were most highly targeted by major federal policy changes.[5] In 1985, the Reagan administration passed the Consolidated Omnibus Reconciliation Act of 1985, and in 1987, it passed the Omnibus Budget Reconciliation Act of 1987.

Both reforms mandated increases in the Medicare payment rate for inpatient hospital services. The 1985 act increased inpatient payments by 1%, and the 1987 act increased inpatient payments by 3% for rural hospitals, 1.5% for hospitals located in large urban areas, and 1% for all other hospitals. The 1987 act also increased the medical economic index for physician services by 3.6% for primary care services and 1% for all other services. These payment increases likely incentivized providers to perform more services.

Both mandates also targeted home health care and other professional services. For example, Medicare home health agencies became required to provide services through licensed health care professionals and were subject to unannounced quality checkups. Medicare also became required to financially cover outpatient occupational therapy services, services provided by optometrists, and services furnished by select clinical social workers. These increases in benefit coverage likely incentivized a higher utilization of services. Although increases in the home health and professional service expenditures were large, these services account for only 1.1–1.6% of national health

[5]The annual growth rate of Medicare expenditures went from 7% in 1986 to 13.7% in 1989. For home health services, the annual growth rate of expenditures went from 13% in 1986 to 26.5% in 1988. For other professional services, the annual growth rate of expenditures went from 14% in 1986 to 21% in 1988. These figures are calculated using data from the National Health Expenditures Account.

expenditures. Changes in hospital and physician payments likely constitute a much larger explanation for the increasing health expenditure growth rate during the late 1980s.

Although certain Medicare payments increased, others were reduced. These included payment reductions for indirect medical education costs, reductions in the prevailing charges for 12 commonly performed procedures, and freezes on the fee schedules for clinical diagnostic laboratory testing.[6] The 1987 act also reduced payments for durable medical equipment, prosthetics, and orthotics. Providers were paid the lesser of either the actual charge for the equipment or the fee schedule amount established by the carrier. This payment change for durable medical equipment foreshadows the 2013 movement toward competitive bidding; under the competitive bidding program, suppliers submit bids to provide equipment and supplies at lower prices than what Medicare currently pays.

3.1.3. The 1989, 1990, and 1993 legislative changes. Following its brief increase, the health expenditure growth rate began to decline once again in the 1990s. While most of the decline can be attributed to the rise of managed care (discussed in Section 3.2), the repeated reductions in Medicare payments also played a role. The 1990s were marked by Medicare payment reductions with the explicit goal of reducing the deficit. The Omnibus Budget Reconciliation Acts of 1989, 1990, and 1993 resulted in annual reductions in Medicare payments from 1991 through 1997. Together with the implementation of the PPS, these reforms were estimated to have reduced Medicare payments by $160 billion. The reductions in hospital payments from Medicare, known as Medicare "bite," had differential impacts during the late 1980s and early 1990s. Cutler (1998) notes that in the 1980s when the PPS was first introduced, Medicare payments were offset by increased prices to private insurers. However, when managed care networks grew, it became more difficult to shift costs from the public sector to private payers, so hospitals were forced to reduce costs by downsizing.[7]

3.2. HMOs and Other Managed Care Arrangements

From the 1940s into the early 1970s, the penetration of HMOs—which limited coverage to care from doctors within a contracted network—grew slowly because providers and states disapproved of limiting provider networks. Over half of states banned consumer-controlled medical plans, 17 states required free choice of physician, and the physicians who founded or managed HMOs were often excluded from state and county medical societies (Gruber et al. 1988). However, after the introduction of Medicare and Medicaid in 1965, federal and state governments gained a vested interest in curbing the rising cost of health care. In 1973, the federal government passed the Health Maintenance Organization Act. The act provided start-up funds for HMOs and required any employer with 25 or more employees providing group health insurance benefits to make HMO enrollment available if a federally qualified HMO in the area requested it.[8] Then between 1981 and 1984, several states passed regulations that relaxed their pre-existing constraints against selective contracts between insurers and providers. The culmination of these policy changes resulted in the rapid growth of HMO plans (Gabel et al. 1986).

[6]The 12 commonly performed procedures are bronchoscopy, carpal tunnel repair, cataract surgery, coronary artery bypass surgery, diagnostic and/or therapeutic dilation and curettage, knee arthroscopy, knee arthroplasty, pacemaker implantation surgery, total hip replacement, suprapubic prostatectomy, transurethral resection of the prostate, and upper gastrointestinal endoscopy.

[7]Medicare bite did not affect the acquisition of new technologies and services provided disproportionately to the poor.

[8]The provision requiring employers to offer an HMO was repealed in 1995.

In the 1980s, other managed care plans, a term broadly used to describe health insurance contracts aimed at reducing costs while improving quality of care, began to gain in popularity. These plans included models such as preferred provider organizations (PPOs), point of service plans, and exclusive provider organizations, which are differentiated by the amount of out-of-network coverage offered and whether gatekeepers are used to access specialized care. Although the rise in managed care participation began almost exclusively within the private sector, by the late 1980s, it had extended to the public sectors. Medicaid managed care grew after states began contracting with Medicaid managed care plans, and Medicare managed care expanded through a series of Medicare demonstrations. After verifying the feasibility of capitation payments, Medicare formally established a risk-contracting program for HMOs in 1985. Medicare PPO demonstrations followed suit in the early 1990s (Langwell & Gordon 1990).

PPO: preferred provider organization

Similar to the PPS, the effects of managed care on utilization, cost savings, and health quality have been studied extensively. Glied (2000) provides a comprehensive review of the literature, and she notes that estimation is complicated by a few empirical difficulties. First, managed care plans vary in their complexity, and data on factors such as cost-sharing arrangements or the stringency of the utilization review procedures are often not released. Second, there is often selection bias because the individuals who decide to enroll in a managed care plan can be very different in terms of underlying health and health utilization preferences relative to those who choose FFS plans. Results of selection studies suggest that managed care plans enjoy a 20–30% prior utilization advantage by attracting younger families and fewer people who are chronically ill (Berki et al. 1977). Nevertheless, the RAND insurance experiment finds no statistically significant differences between the prior expenditures of those assigned to an HMO and those who voluntarily chose the plan (Manning et al. 1984).

Chernew et al. (1998) and Miller & Luft (1994, 1997) offer detailed reviews of studies that examine the effect of managed care enrollment on utilization. Because of selection bias, they focus on publications that attempt to account for differences between managed care and nonmanaged care enrollees. There is large variation in results, likely stemming from a limited ability to control for selection, imperfect information on plan characteristics, heterogeneity across managed care plans, and nonuniform measures of utilization. Nevertheless, on average, studies conclude that total charges tend to be approximately 10–15% lower in HMO plans. It is less clear whether PPOs generate the same type of expenditure reductions (Smith 1997), and it does not appear that Medicaid managed care plans lower Medicaid spending (Duggan & Hayford 2013).

Although the aforementioned studies identify modest cost savings from managed care plans, it is not equivalent to showing that managed care plans reduce total health care costs. If cost savings are occurring due to the selection of healthier patients or the selective entry of managed care plans into markets that are on average lower cost, then total health costs may actually increase with higher managed care penetration. Extensive reviews of the studies can be found in Glied (2000) and Baker (2003). Among the more recent studies that try to limit health plan level selection, most find a negative relationship between managed care penetration and the total cost growth rate (e.g., Baker 1997, Cutler & Sheiner 1998, Robinson 1996).

Others have noted that administrative costs of managed care are particularly high, and the cost of administering utilization controls is higher in the private sector relative to Medicare (Philipson et al. 2010). The lower administrative costs of Medicare are often interpreted as part of the value generated by centralized insurance. To break even with Medicare FFS plans, Brown et al. (1993) estimate that private managed care plans must decrease expenditures by at least 15% to simply cover administrative costs for marketing, negotiation of provider contracts, and regulatory and compliance management.

There are several channels through which managed care plans can affect health expenditures. Several studies provide evidence that physicians adopt practice styles that apply differently across their insured patients (Baker & McClellan 2001, Glied & Zivin 2002). Because financial risk has been transferred to providers, they have a greater incentive to reduce the cost of care. Utilization controls, such as having a primary care gatekeeper and preauthorization requirements, also reduce unnecessary services and improve coordination of care (e.g., Hurley et al. 1991). Miller & Luft (1994) review the literature and conclude that managed care patients have shorter lengths of stay, fewer inpatient admissions, less use of expensive procedures and tests, higher outpatient utilization, and higher use of preventative services.

Other studies focus on the ability of managed care plans to negotiate lower provider prices in the private health insurance market (Cutler et al. 2000). Inefficient providers can be excluded from the network, and patients can be steered to providers who agree to accept discounted payments (Bindman et al. 1998, Mays et al. 2003). The 1990s reduction in Medicare hospital payments further encouraged contracting between insurers and low-cost hospitals.

A final channel through which managed care can reduce costs is by slowing the diffusion of technology. Cutler & Sheiner (1998) consider several technologies, including advanced cardiac procedures, radiation therapy, diagnostic radiology, and transplant services. They find preliminary evidence that increased HMO enrollment is associated with less rapid diffusion of new technologies, and this effect increases over time. Baker (2001) and Baker & Wheeler (1998) provide a more detailed study on the impact of HMOs on magnetic resonance imaging (MRI) diffusion and use. They find that high managed care markets have significantly slower diffusion rates of MRIs into hospitals and lower rates of MRI procedure use. Despite the slowdown in technology adoption, the quality of care or health outcomes do not appear to be compromised under managed care plans (Ware et al. 1987).

3.3. Other Factors: Inefficiency and Physician-Induced Demand

Despite cost containment introduced through the PPS and managed care system, the increasing fragmentation and complexity of payment structures during this time period led to increased administration costs and reduced efficiency. Comparing administrative costs between the United States and Canada from 1983 to 1987, Woolhandler & Himmelstein (1991) show that administrative costs—as a percent of total hospital spending, total costs, or gross income—increased significantly in the United States but declined in Canada. These costs can be traced to higher insurance overhead among both private and public insurers, higher hospital and nursing home administration costs, and greater physician overhead and billing expenses. To this day, administrative costs remain one area in which the United States spends a disproportionately large share of its per capita health expenditures. In 2010, the United States spent nearly $900 per person per year on administrative costs, whereas Canada spent $416 per person per year and Japan spent $120 per person per year.[9]

In addition to increasing administrative inefficiency, a substantial amount of literature has focused on the idea of physicians encouraging their patients to demand services with minimal benefit (e.g., Evans 1974, Fuchs 1978). Known as physician-induced demand, this behavior can occur because patients are not fully informed and physicians act as agents on behalf of the patients. Researchers have postulated two main theories to explain physician-induced demand (Ellis & McGuire 1993, McGuire & Pauly 1991). First, physicians might be motivated to maintain a certain

[9]These figures are based on the authors' calculations from the 2012 OECD health data.

level of income, so if their income falls below their target, they will alter their recommendations to produce additional income. Second, as Arrow (1963) first noted, there may be professional uncertainty regarding the effectiveness and success of various treatment options. This uncertainty can create what appears to be physician-induced demand. McGuire (2000) reviews the literature and concludes that there is a large volume of empirical research that supports the idea of physician-induced demand. However, the literature has not been highly discriminatory between the target income hypothesis and theories with fixed provider preferences. Some of the more compelling evidence for physician-induced demand comes from studying births. For example, Gruber & Owings (1996) show that obstetricians replace drops in their income due to lower fertility rates by increasing the number of cesarean sections performed.

4. PERIOD 3: THE MANAGED CARE BACKLASH, 1995–2002

Transitions into managed care plans were not without controversy. Despite the early enthusiasm for managed care, health care markets underwent an abrupt transition from support for HMOs to retrenchment and disillusionment in the late 1990s. This backlash stemmed from negative consumer sentiments, economic prosperity, legislative responses to consumers, and changes in hospital market power. As health plans lost traction in their efforts to contain costs, premiums increased, returning to the levels of the mid-1980s. Benefits packages were trimmed, and cost sharing, particularly for pharmaceuticals, reached new highs.

4.1. The Response to Managed Care

Robinson (2001) documents several key developments that led to backlash against managed care. Negative perceptions of managed care began to develop, and these perceptions were influenced by major media attention and several major lawsuits (Blendon et al. 1998). One of the most prominent court cases occurred when a California jury awarded $89.3 million to the family of a woman whose Health Net HMO refused to pay for a costly, experimental procedure to treat the breast cancer that ultimately killed her. Another important verdict handed down a $120 million fine on Aetna US Healthcare for having review processes that delayed a cancer patient's high-dose chemotherapy treatment and bone marrow transplantation.

Public opinion polls showed that consumers, despite having a high personal satisfaction with managed care, held broad negative views of managed care based on anecdotal stories of patients being denied treatment (Brodie et al. 1998, Lesser & Ginsburg 2000). Consumers lamented the lower quality of care, poorer access to providers, and administrative hassles that restricted use of care, and Internet technology enhanced the ability of consumers to search for and switch among plans (Strunk et al. 2001). With the Internet, consumers could easily check eligibility, benefits, and coinsurance limits, and they could read up on others' evaluations of quality.

Employers responded to growing consumer discontent by favoring loosely managed PPOs and open-access HMOs over stricter closed-network plans (Heffler et al. 2001). With the booming economy in the mid-1990s to early 2000s, employers faced pressure to attract and retain employees, so they catered to their employees' health insurance preferences. They even absorbed much of the increase in premiums during this period on behalf of their employees. Draper et al. (2002) note that employers saw their premiums increase by 11% between 2000 and 2001, the highest rate of increase since 1993.

Policy makers responded by adopting regulatory limits on the use of some managed care tools. Between 1999 and 2002, several pieces of managed care consumer legislation passed through the Senate and House, including two Bipartisan Patient Protection Acts (Hearne & Chaikind

2002). States themselves enacted dozens of measures, including laws that prohibited primary care gatekeepers, restricted utilization review, and mandated benefits (Cooper & Green 1991). The "any willing provider" laws also ensured that providers had equal access to beneficiaries of managed care plans. Together, these laws made it more difficult for managed care plans to limit coverage or to unreasonably restrict the use of out-of-network providers.

Not all legislation worked against managed care organizations. For example, the Balanced Budget Act of 1997 authorized the HCFA to create Medicare managed care contracts with coordinated plans, such as HMOs and PPOs. At the time, these new health plan contracts were part of the Medicare+Choice program, which, under the Medicare Prescription Drug, Improvement, and Modernization Act of 2003, became known as the Medicare Advantage program. The Balanced Budget Act of 1997 also gave states the authority to mandate enrollment in Medicaid managed care plans without obtaining a federal waiver.

However, these policies were not successful at maintaining enrollment into managed care plans. Gold (2001) notes that the Balanced Budget Act of 1997 occurred during a time when Congress concurrently reduced FFS Medicare prices, translating to lower premiums for Medicare+Choice plans. Furthermore, adequate provider networks became more difficult to form, and the HCFA experienced a complete reorganization of their central office, leading to a diminished ability to approve insurer participation plans. These conditions resulted in plans withdrawing from the Medicare+Choice market or offering less generous benefit designs. Similarly, Medicaid managed care plans became unattractive when Medicaid lowered capitation rates, failed to lessen the burden of providing particularly expensive services, and mandated enrollment (Long & Yemane 2005).

Hospitals responded by using their growing market power to negotiate a return to traditional competitive strategies. Throughout the 1990s, the hospital industry was becoming more consolidated through mergers and acquisitions. In 1997, the number of mergers and acquisitions peaked at 310 but fell to 132 in 2000 (Cuellar & Gertler 2003). With increased bargaining power, hospitals were able to move toward higher payment rates and better contract terms. Unlike prior disputes with insurers, the disputes in the early 2000s were notable because provider organizations were willing to walk away from health plan networks, and these disputes involved the largest, most prominent providers in the community (Lesser et al. 2003).

Although hospital prices did rise, utilization rates, measured by the quantity of services per capita, were the largest contributor to the acceleration of hospital spending. Coupled with an increasingly tight labor market, this increase in demand for services led to widely reported shortages of nurses, pharmacology technicians, and imaging and laboratory technicians (Levit et al. 2003). By 2001, the wages for private hospital workers were increasing by 6% a year.

Finally, insurers responded to provider, consumer, and governmental pressures by offering fewer managed care plans, outrunning costs by raising premiums, and increasing cost sharing (Robinson 2001). This response corresponds to the observation that between 1994 and 2001, both the growth rate of private expenditures and out-of-pocket costs increased by 5 percentage points.

4.2. Other Factors: Medicaid Expansions, Medicare Legislation, and Prescription Drugs

Other factors contributed to the rise in health expenditures during this period: extended Medicaid eligibility, higher Medicare payouts, and growth in prescription drug spending. Between 1994 and 1996, Medicaid coverage declined due to strong economic growth and the disentanglement between Medicaid eligibility and eligibility for Temporary Assistance for Needy Families. However in 1997, Medicaid coverage expanded significantly with the State Children's Health Insurance Program (SCHIP). Established through the Balanced Budget Act of 1997, SCHIP allocated

$40 billion over 10 years to aid states in expanding their Medicaid programs to low-income children. By 1999, SCHIP enrollment had already reached 1.8 million, and this figure continued to rise to 3.9 million in 2003. The increased enrollment into SCHIP led to not only an increase in state and federal health expenditures, but also a rise in utilization rates among the newly insured.

SCHIP: State Children's Health Insurance Program

Medicare payment policies also contributed to the expenditure growth. Although the Balanced Budget Act of 1997 made several large financial cuts with the hopes of reducing spending, the Clinton administration, amid growing political pressure, passed the Medicare, Medicaid, and SCHIP Balanced Budget Refinement Act of 1999. This 1999 act restored $27 billion to various providers, with the biggest winners being Medicare managed care organizations. It also canceled the proposed across-the-board reductions to the outpatient PPS and protected providers against any losses incurred during the first three years of outpatient-PPS implementation.

Finally, toward the end of the 1990s, spending on prescription drugs began to grow. Insurers increasingly adopted three-tier pharmacy benefits that required consumers to pay higher copays for preferred and brand-name drugs (Mays et al. 2003). Patients also began using drug therapies for longer periods of time. Drug companies invested in more direct-to-consumer advertising, and they received extended patent lives. Whereas the effective patent life averaged 8.1 years between 1980 and 1984, the "base" patent life in the late 1990s had been increased to 9.5 years, with possible extensions of up to 15.4 years (Heffler et al. 2001). However, these patterns eventually shifted.

5. PERIOD 4: THE GOLDEN ERA, 2002–2015

In 2002, the growth rate of health expenditures fell again, but unlike the fits and starts from the policy era, this slowdown has been sustained and continuous. From 2008 to 2013, the annual real health expenditure growth rate has reached new lows, falling below the former lows in 1980 and 1996. We know surprisingly little about the root causes. Many have focused on identifying whether this slowdown in health spending is a result of (*a*) broader economic factors, (*b*) structural changes in the health care system, or (*c*) both. If broader economic factors are driving the observed slowdown, one can expect the growth rate of health expenditures to rise in the future. However, if structural changes are more responsible, then one can expect a continuation of historically low growth rates.

5.1. The Role of the Economy

One obvious culprit is the Great Recession, and several studies have considered the role of economic downturns in explaining the slowdown in growth. The results point to an economic contribution, but there is no consensus on the magnitude. Levitt et al. (2013) use a time-series analysis to identify macroeconomic variables that are highly predictive of the growth in health spending in any given year. By focusing on inflation and growth in real GDP, they conclude that macroeconomic effects account for 77% of the recent decline in health spending growth. Instead of assuming a constant relationship between GDP and spending across all years, Dranove et al. (2014) exploit variation in the regional severity of the economic slowdown to similarly conclude that the recession explains approximately 70% of the slowdown from 2007 to 2011. Others have attributed a much smaller role to the recession. Cutler & Sahni (2013) form projections for expected health spending based on economic models, and they conclude that the recession accounted for 37% of the overall slowdown in expenditures from 2003 to 2012. Levine & Buntin (2013) find no evidence that unemployment, loss of income, or declines in the values of beneficiaries' assets affect the use of services among Medicare beneficiaries.

Of these studies, few focus on identifying the mechanisms by which recessions affect health spending. Demand is likely a factor. Recessions can lower consumer income, reduce the availability

of employer-sponsored insurance through job loss, or cause employers to reduce health benefits on existing plans. All of these channels will reduce utilization of health services. Ryu et al. (2013) use data on the health spending behavior of beneficiaries at large firms to parse these effects. They show that the effects of the recession extend beyond job loss, and the reductions in health spending occur primarily because of rising out-of-pocket costs. An alternative effect of the recession is to shift private coverage toward public coverage. Holahan & McMorrow (2013), Truffer et al. (2010), and Sisko et al. (2009) note that between 2007 and 2012, both Medicaid enrollment and spending increased. However, the growth in Medicaid spending per enrollee has been well below the growth rate in the medical care consumer price index, suggesting that Medicaid has been able to keep cost increases below that of other sectors in the health system (Young et al. 2014).

However, the recession does not tell the whole story. **Figure 3** shows that the slowdown in expenditures clearly extends beyond the recession periods. The slowdown began as we exited the 2001 recession, and it has continued through 2013. While the decrease in health expenditure growth appears particularly pronounced during the Great Recession from 2007 to 2009, other factors must be responsible for at least the prerecession decline.

5.2. Demand-Side Structural Changes

Some have pointed to permanent changes in benefit design, beyond the effects of the recession, to explain why the slowdown is permanent (e.g., Cutler & Sahni 2013). Although the growth rate of beneficiary out-of-pocket costs remained constant between 2002–2006 and 2007–2011, Baicker & Goldman (2011) note that the level of real per capita out-of-pocket spending has been increasing. The prevalence of managed care plans has also increased. By 2010, only 1% of employer-sponsored plans were FFS plans. Health economists since Arrow have worked on optimal insurance design, and the increase in patient cost sharing can be seen as a move toward more efficient designs. However, few plans implement cost sharing that discriminates between the use of high- versus low-value care. Through various insurance structures, patients can be incentivized to utilize care more efficiently. One such structure is value-based insurance design (VBID) plans that align patients' out-of-pocket costs with the value of the health services they receive. For example, statin copayments may be lowered for patients with coronary artery disease but not for those receiving treatment for primary prevention. Although the literature suggests that modest benefits are realized through VBID, it is unclear whether these programs are cost saving. Lee et al. (2013) review 13 studies and conclude that VBID designs improve adherence and lower out-of-pocket spending for drugs. They do not find any significant changes in overall medical spending. However, Goldman et al. (2007) and Mahoney (2008), two studies not reviewed by Lee et al. (2013), find decreases in total health costs. In addition to inconclusive evidence on health costs, little work has been done to estimate the administrative costs of implementing VBID programs. Establishing VBID programs can require considerable effort because the value of a given service changes across subgroups of patients. VBID programs have contributed to the slowdown in health spending only to the extent that they help reduce total expenditures.

Consumer-directed health plans (CDHPs), introduced in the mid-2000s, may also have contributed to the slowdown in health expenditures. These plans combine high-deductible coverage with tax-exempt savings accounts, which are used to pay for routine health care expense. The goal of these savings accounts was to encourage consumers to be more cost-conscious users of health care. CDHPs started to rise in popularity when regulation passed by the Internal Revenue Service between 2001 and 2002 aided in the establishment of health retirement accounts. Health retirement accounts are a type of CDHP in which an employer adds funds for an employee's health expenses. Unused funds revert to the employer if the employee leaves the company. An alternative

VBID: value-based insurance design

plan that allowed for greater consumer involvement—health savings accounts—was established in the 2003 Medicare Modernization Act. In a health savings account, both the employer and employee can contribute to the account, but the funds are portable with the employee.

There is robust empirical evidence that CDHPs effectively incentivize patients to change their health care use and reduce costs in the first year after introduction (e.g., Buntin et al. 2011, Lo Sasso et al. 2010). Researchers have also established longer-term impacts of an approximately 15% reduction in total spending within the first three years of CDHP enrollment (Haviland et al. 2016). Wilensky (2006) suggests that in addition to lower costs, hospitals might be pressured to increase price transparency and establish greater uniformity in pricing. Several studies have found that higher drug cost sharing can reduce the use of essential chronic illness medications. For example, Gaynor et al. (2006) find that consumers substitute prescription drug use with outpatient care, and 35% of savings achieved by reductions in drug spending are offset by consequent increases in other medical spending. Goldman et al. (2007) find that increased cost sharing is associated with lower rates of drug treatment, worse adherence, and more frequent discontinuation of therapy.

Finally, the 2006 passage of Medicare Part D, the Medicare prescription drug plan, certainly increased demand for pharmaceuticals, but there is also evidence it may have reduced total spending. Part D spending depends on several factors, including the number of Part D enrollees, their health status, and their drug use. It also depends on each plan's ability to manage use and negotiate discounts. Actual Part D spending has been lower than anticipated because enrollment has been lower than projected. Furthermore, Shang & Goldman (2010) show that prescription drugs and medical services covered by Medicare Parts A and B are substitutes: A $1 increase in Part D drug spending is associated with a $2.06 reduction in Medicare Part A spending and a $0.44 reduction in Medicare Part B spending. In other words, $1 spent on Part D can reduce overall Medicare spending by $1.50.

CDHP: consumer-directed health plan

ACO: Accountable Care Organization

5.3. Supply-Side Structural Changes

Others attribute the slowdown to changes in the organization and delivery of care, with the rise of Accountable Care Organizations (ACOs) being perhaps the most popular. First coined around 2006, ACOs are groups of doctors, hospitals, and other providers who come together to voluntarily coordinate care. The popularity of ACOs has grown over time with an estimated 14% of the US population now being served by an ACO (Gold 2015). The research on these organizations remains limited, but initial work suggests that some ACOs share in savings of up to $300 million, whereas other ACOs have insignificant impacts on spending relative to their benchmarks (McClellan et al. 2015). Regardless of the potential cost-containment benefits, ACOs grew in popularity mainly after the Patient Protection and Affordable Care Act (ACA), and they cannot explain the earlier slowdown in health expenditures observed from 2000 to 2006.

Another supply-side change is a growing emphasis on preventive care. Thorpe (2005) notes that changes in clinical thresholds for treatment have resulted in earlier interventions. For example, the thresholds for hypertension have been steadily lowered from 160/95 mm Hg in 1980 to 140/90 mm Hg.[10] The lowered threshold expands the number of Americans targeted for primary prevention. Similar changes have occurred with lipid controls for elevated cholesterol levels and glucose levels for diabetes. Although several components of the ACA emphasize the importance of preventive care, the evidence on the cost-saving potential of preventive care remains mixed. Cohen et al. (2008) review 599 studies in the literature. They conclude that focusing on certain preventable

[10]The first number represents the systolic blood pressure; the second represents the diastolic blood pressure.

causes of death, such as poor diet, physical inactivity, and smoking, can generate cost savings, but not all preventive measures represent cost-effective care.

Other studies have focused on the decline of health care prices over time. While isolating the price component of changes in health expenditures may be difficult, White & Ginsburg (2012) note that the trend toward tighter Medicare payment policies began in the mid-2000s. The Deficit Reduction Act of 2005 reduced payment rates for imaging, home health services, and durable medical equipment, whereas the Medicare Improvements for Patients and Providers Act of 2008 made substantial cuts to Medicare Advantage plans. More generally, Medicare payments have risen below the relevant index of inflation each year (Martin et al. 2014). Because private payments tend to follow changes in Medicare fees, it is possible that tighter Medicare payment policies created spillover effects in private payments as well (Clemens & Gottlieb 2013).

Finally, some researchers cite the slowdown in technology and pharmaceutical development as a potential explanation for the slowing spending growth. Cutler & Sahni (2013) note that spending on prescription drugs has fallen from a 10.1% annual growth rate between 1993 and 2003 to a 2.3% annual growth rate between 2003 and 2012. They attribute this decline to the number of drugs coming off patent and fewer introductions of new blockbusters. Furthermore, drugs that accounted for approximately 17% of prescription drug spending in 2013 are coming off patent in the next five years. Similar patterns have been observed for the use of expensive imaging technology. Whereas the use of advanced imaging previously grew at an annual rate of 6% or more, the use of imaging decelerated around 2005 (Lee & Levy 2012).

5.4. Demographic Shifts

Although economic and structural factors may have lowered costs, many demographic factors—including a growing aging population and the rising prevalence of chronic diseases, notably obesity, across all age cohorts—have contributed to increasing health expenditures. Relative to those ages 35–44, the average per capita health spending for Americans ages 75 and older was five times as high in 1999. Many have concluded that the increasing fraction of elderly in the overall population will contribute to increasing health expenditures (Schneider & Guralnik 1990). Nevertheless, Reinhardt (2003) notes that the annual growth in spending has affected per capita spending for all age groups, and the growth of the aging population is too gradual a process to rank as a major cost drive in health care.

Another key demographic factor is that the US population has become less healthy over time. Beginning in the 1980s, the obesity rate shot up, increasing from 15% of the adult population to 35% of the population by the mid-2000s. Thorpe et al. (2004) find that obesity is responsible for 25% of the rise in health spending from 1987 to 2001, and Finkelstein et al. (2009) conclude that the annual medical burden of obesity has increased to almost 10% of all medical spending between 1998 and 2006. Although the prevalence of obesity has remained fairly stable from 2003 through 2010, more recent CDC data suggest that there have been statistically significant decreases in obesity prevalence among children ages 2–5 and women ages 60 and older (Ogden et al. 2014).

More generally, the number and proportion of Americans living with chronic diseases, including heart disease, asthma, cancer, and diabetes, have been increasing over time (Hoffman et al. 1996). Lakdawalla et al. (2004) further highlight that disability rates among people under age 50 have been increasing, in part because general health among the young has been deteriorating. Treatment for people with chronic diseases and conditions accounts for most of health care costs. According to the Centers for Disease Control and Prevention, in 2010, the treatment of those with chronic diseases and conditions accounted for 86% of all health care spending. They

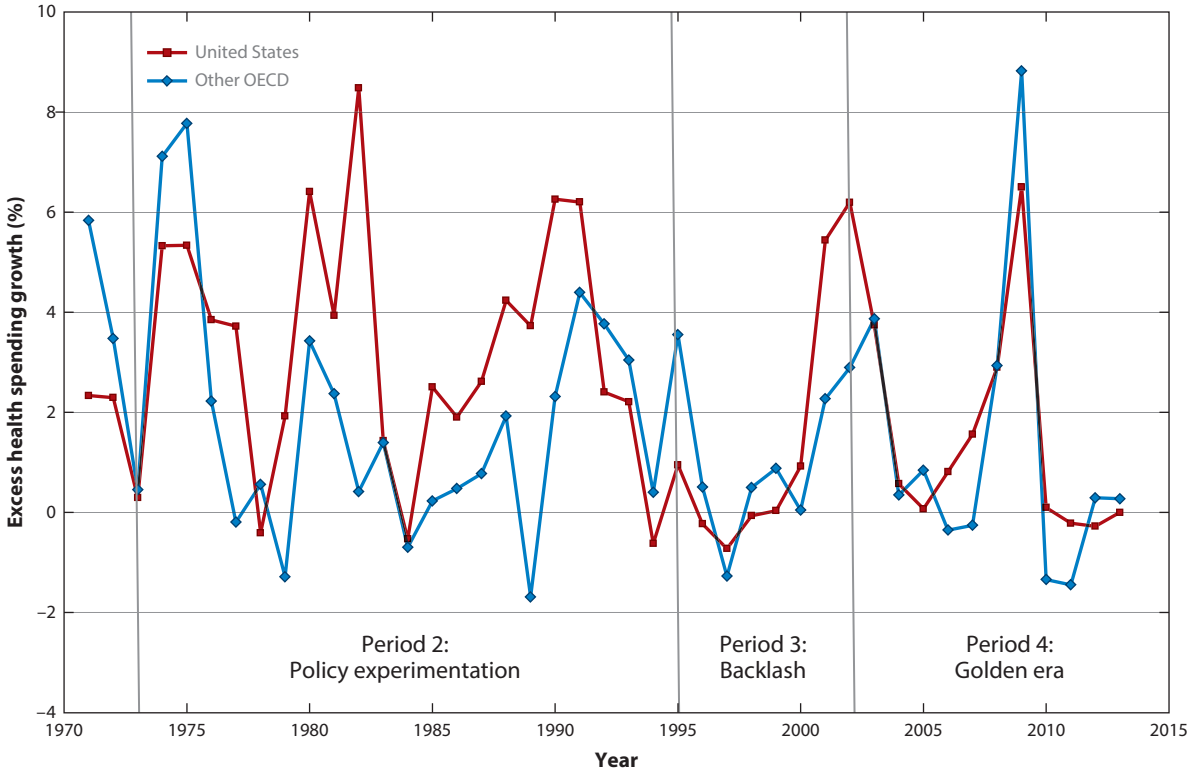

Figure 4

Global changes in the excess health spending growth rate, 1971–2013. Following Squires (2014), we define the excess health spending growth as the annual growth rate in health expenditures that exceeds the annual growth rate in GDP. Data are from OECD Statistics. Due to the sparsity of data in 1960, we truncate the graph to examine 1971 to 2013. Only countries with annual data from 1970 are included. The US excess spending growth (*red*) is compared to a population-weighted average of excess spending growth in other OECD countries (*blue*), which include Austria, Canada, Czech Republic, Finland, France, Germany, Ireland, Norway, Portugal, Spain, Switzerland, and the United Kingdom. This figure illustrates that changes in excess spending are similar across all countries. The largest deviation between the United States and other OECD countries is during the policy experimentation period.

also estimated that heart disease and strokes together cost at least $315 billion, cancer care costs $157 billion, diabetes costs $245 billion, arthritis and related conditions cost $128 billion, and medical costs linked to obesity are $147 billion.

6. CONCLUSION

Since the 1950s, life expectancy in the United States has risen at a steady pace, driven mostly by reduced mortality at older ages. The social benefits of these improvements are tremendous—on the order of 50% of US gross domestic product—although these gains are not widely recognized (Murphy & Topel 2006). These improvements have also come at substantial cost, with the United States devoting an increasing share of its income to health care. The rising fraction of income going to health care expenditures is a worldwide phenomenon. **Figure 4** compares the excess health spending growth of the United States with that of other OECD countries over time. Following Squires (2014), we define excess health spending growth as the percent change in annual health expenditures that exceeds the percent change in the annual GDP, and we compare the United States to a

population-weighted average of 12 OECD countries. As **Figure 4** demonstrates, changes in the excess health spending growth rate have been quite similar between the United States and other countries.

Clearly there are shared factors at play, and health economists have also demonstrated that technology plays a crucial role. However, it is also the case that technology is treated as a residual for the unexplained portion of spending growth. Chandra & Skinner (2012) categorize technological progress in health care based on its impact on cost and health: (*a*) high-efficiency, low-cost innovations; (*b*) costly innovations with high efficiency for particular subgroups; and (*c*) costly innovations with uncertain efficiency. The first two lead to large improvements in life expectancy, but they are not to be blamed for the rise in health spending relative to other nations. It is the third category that has been uniquely abundant in the United States.

The field of health economics has been most successful in identifying payment system reforms and demand-side controls that can slow the diffusion of these innovations, without an immediate hit to population health, at least in the short run. Longer term, there is the question of whether efforts to control technology will induce a harmful reduction in innovation, with personalized medicine—currently suggesting great promise but also great expense—being a notable example. We clearly need a better understanding of what precisely constitutes innovation, how it diffuses, and whether it can be harnessed to slow spending growth in a way that is socially desirable. Given the successes of the past half century, this seems well within the realm of possibility.

DISCLOSURE STATEMENT

D.G. is a founder of Precision Health Economics, a consultancy providing services to the health insurance and life sciences industries. A.C. is not aware of any affiliations, memberships, funding, or financial holdings that might be perceived as affecting the objectivity of this review. The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health. The views expressed herein are those of the authors and do not necessarily reflect the views of the National Bureau of Economic Research.

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