

Journal of Policy Options • RESDO



The Impact of Slow Productivity on Healthcare Costs in a No-Growth: An Empirical Analysis

Leticia Russo^a

Abstract

This study investigates whether the healthcare sector is vulnerable to Baumol's cost disease in the context of a no-growth economy. Baumol's model suggests that sectors with stagnant productivity are subject to rising wages that outpace productivity growth, leading to increasing costs. However, in a no-growth economy where overall income remains constant, it is unclear whether this dynamic would still hold. The study explores two institutional scenarios: selective reduction of productivity and a reduction in working hours. In both scenarios, the findings suggest that Baumol's cost disease does not directly impact the healthcare sector. However, the second scenario—reducing working hours—reveals a significant outcome. Given the slow productivity growth typical of the healthcare sector, maintaining the same level of service will require a larger workforce over time. Consequently, the relative cost of healthcare is expected to rise steadily. This result implies that even though the healthcare sector may not experience Baumol's cost disease in the traditional sense within a no-growth economy, the sector will still face increasing relative costs. The need for more workers to sustain healthcare services as productivity growth lags behind other sectors will drive these cost increases. Baumol's cost disease may not directly afflict the healthcare sector in a no-growth scenario, the study finds that the relative cost of healthcare will likely continue to rise due to the increasing demand for labor. This highlights the importance of considering long-term strategies to manage healthcare costs, even in the absence of economic growth, to ensure the sustainability of the sector and the affordability of healthcare services.

Keywords: Healthcare Sector, No-Growth Economy, Productivity, Labor Costs

JEL Codes: I10, O41, J30

1. INTRODUCTION

Over the past several decades, OECD countries have experienced steadily rising healthcare expenditures, which have placed increasing pressure on state budgets and become a major concern for policymakers. On average, total healthcare spending as a percentage of GDP in OECD countries has risen from 3.8% to 10.5% over the last 50 years. This surge in healthcare costs poses significant challenges for managing public finances and ensuring long-term sustainability. According to Baumol (1996), the complexity of this issue lies in the fact that the costs of what he calls stagnant sectors—sectors with slower productivity growth—are considerably higher today and will continue to rise substantially in the future. Baumol argues that healthcare is one of these stagnant sectors, where rising costs can be attributed to slow productivity growth, a phenomenon often referred to as Baumol's cost disease. In sectors like healthcare, it is difficult to achieve significant productivity gains because many services require personal interaction and skilled labor, which are less susceptible to automation or efficiency improvements. As a result, costs rise more quickly than in sectors with faster productivity growth, exacerbating the financial strain on governments and healthcare systems.

Baumol (1967) distinguishes the economy into two sectors: the progressive sector and the stagnant sector. In the progressive sector, regular growth in labor productivity is achievable through technological advancements and efficiency improvements. In contrast, the stagnant sector, which includes industries such as education and healthcare, experiences much slower productivity growth. Baumol (1996) argues that service industries, like healthcare, have resisted reductions in labor per unit of output, meaning that labor-intensive tasks remain central to their operation. This leads to these sectors being classified as relatively stagnant, as productivity gains are harder to achieve compared to sectors where automation and technological advancements can replace labor. Baumol does not suggest that stagnant sectors never experience increases in labor productivity. Rather, such productivity gains tend to be sporadic and less consistent over long periods. In healthcare, for instance, technological advancements have indeed occurred, but these have primarily focused on improving the quality of care rather than directly enhancing labor productivity. For example, innovations in medical devices or treatments may lead to better patient outcomes but do not necessarily reduce the amount of labor required to deliver healthcare services. This results in rising costs, as productivity struggles to keep pace with demand and the need for skilled labor remains high. Consequently, sectors like healthcare face increased costs over time, driven by the inherent challenges of improving productivity in labor-intensive

^a Departamento de Economia, Centro de Ciências Sociais Aplicadas, Universidade Federal da Paraíba, João Pessoa, Brazil

industries.

Other industries, such as live performing arts, automotive repair, and postal services, also suffer from Baumol's cost disease. These industries are characterized by the need for a "human touch," which makes them resistant to labor productivity growth (Baumol, 1993). Baumol (1996) further explains that in stagnant industries, wage rates tend to rise in line with the higher wage rates in the progressive sector, even though productivity in these stagnant industries remains relatively unchanged. To illustrate this, Baumol contrasts automobile production (a progressive sector) with the performance of Mozart quartets (a stagnant sector). In the automobile industry, productivity increases lead to a rise in both total cost and output by the same percentage, meaning that labor cost per unit remains unchanged. In contrast, in the performance of Mozart quartets, where productivity remains static, the earnings of musicians must still increase over time to keep pace with wage growth in the progressive sector. As a result, the cost per unit in the stagnant sector (in this case, a performance) must rise, as wages increase without corresponding gains in productivity. This dynamic creates a situation where stagnant sectors, like healthcare, performing arts, or education, experience rising costs over time. The higher wage rates in these sectors are necessary to attract workers, who otherwise might be drawn to more productive, higher-paying jobs in the progressive sector. Baumol emphasizes that this phenomenon is not merely price inflation but rather a reflection of real price increases driven by stagnant productivity and rising wages. This creates persistent challenges for industries heavily dependent on human labor, as costs continue to escalate without corresponding productivity improvements.

One of the primary reasons for slow productivity growth in the services sector is the lack of standardization in the production process. Unlike manufacturing, where tasks can be highly standardized and automated, service industries require the analysis of each individual case, making it difficult to streamline processes. Additionally, the quality of services is often closely tied to the amount of human labor involved, meaning that it is challenging to reduce working hours without negatively impacting the quality of service provided (Baumol, 1993). In sectors such as healthcare and education, for example, cutting down on labor time could result in diminished service quality, further hampering efforts to increase productivity. Baumol's outlook on the future costs of stagnant sectors such as healthcare and education is pessimistic. He predicts that in the coming decades, the costs of these sectors will grow to the point where they will absorb more than half of the GDP. However, this analysis also considers the increase in income across all sectors, as economic growth continues. Essentially, while the rising costs of stagnant sectors will consume a significant portion of GDP, overall economic growth may help to mitigate the negative impact on the economy. Today, the focus on economic growth policies in wealthy countries is increasingly being questioned, particularly in the context of environmental problems. The pursuit of continuous economic growth is being scrutinized as concerns about sustainability, resource depletion, and environmental degradation grow. Alongside these concerns, there is a rising interest in concepts such as low growth, no growth, and degrowth (Victor, 2011), which question the feasibility and desirability of pursuing endless economic expansion. This emerging discourse highlights the tension between traditional growth-oriented economic policies and the pressing need to address environmental and social challenges in a way that may require rethinking the priority given to economic growth.

2. LITERATURE REVIEW

Despite the significant growth in health expenditures over recent decades, they continue to rise globally. Several widely accepted explanations account for this increasing expenditure, including the introduction of new medical technologies, population aging, expansions in health insurance coverage, the growth in defensive medicine practices, rising administrative costs, the growing number of physicians, and overall national income growth (Keenan, 2004; Medeiros and Schwierz, 2013). Among these factors, the relationship between national income growth and healthcare spending has been extensively studied, with numerous studies providing evidence of a positive correlation between healthcare expenditure and GDP. Research by Lago-Peñas et al. (2013), Fedeli (2012), Baltagi and Moscone (2010), Dreger and Reimers (2005), and Gerdtham and Lothgren (2000) highlights this connection, demonstrating that as a country's economy grows, healthcare spending tends to rise proportionately. In addition to these well-documented factors, another less frequently discussed explanation for the continuous increase in health expenditures is Baumol's cost disease. This concept suggests that industries with slower productivity growth, such as healthcare, experience rising costs over time because wages must increase to compete with sectors that have faster productivity growth, even though the productivity in healthcare remains relatively stagnant. This cost disease exacerbates the ongoing rise in healthcare expenditures, as higher wages in the sector do not correspond to proportional gains in efficiency or output, contributing to the escalating costs.

Baumol (1996) highlights the significant increase in the price of healthcare services, particularly in the United States, where the annual rate of increase in the price of a physician's services exceeded 5.5% per year between 1948 and 1995, while the overall inflation rate averaged less than 4% per year. This indicates that the price of a doctor's services more than doubled in real terms over this period. An even more dramatic example can be seen in the price of a hospital room, which rose at an average annual rate of 8.6%, resulting in an 800% increase in terms of constant dollars during the same period. These figures illustrate how sectors like healthcare, where productivity improvements are slow or stagnant, experience much faster price increases compared to sectors with higher productivity growth. In

his analysis, Nordhaus (2006) explores industrial data from 1948 to 2001 to further investigate Baumol's cost disease across multiple sectors. His study examines six key aspects of Baumol's theory, reaching the following conclusions. First, sectors with lower productivity growth tend to have higher growth in relative prices. Second, stagnant sectors, like healthcare and education, show slower growth in real output compared to progressive sectors, such as manufacturing and technology. Third, sectors with slow productivity growth tend to have declining nominal output shares over time. Fourth, progressive sectors—those with higher productivity growth—typically displace labor and exhibit lower growth in hours and employment, although manufacturing is an exception in this regard. Notably, technological change in these sectors is the primary driver behind differential employment growth. Fifth, economic gains in progressive sectors result in higher wages and profits, but most productivity gains (95%) are passed on to consumers in the form of lower prices. Nordhaus's findings affirm that during the period analyzed, the economy suffered from Baumol's growth disease, where technologically stagnant sectors experienced higher growth in relative prices and slower growth in real output than technologically advanced, progressive sectors. This divergence underscores the economic challenges posed by sectors like healthcare, where rising costs are a persistent issue due to slow productivity growth, further compounding the difficulties in controlling price inflation in these critical industries.

Empirical studies provide substantial support for Baumol's theory of cost disease. For instance, Hartwig (2008a), in his analysis of pooled cross-section and time-series data for 19 OECD countries, finds robust evidence that healthcare expenditure is largely driven by wage increases that exceed productivity growth, a key characteristic of Baumol's cost disease. Similarly, Bates and Santerre (2013) investigate the phenomenon in the United States using panel data from 50 states over the period from 1980 to 2009. Their findings confirm that the U.S. healthcare sector indeed suffers from cost disease, with wages rising disproportionately compared to productivity improvements. Further, Colombier (2012), examining data from 20 OECD countries between 1965 and 2007, also finds compelling evidence supporting the cost disease hypothesis. In a related study, Hartwig (2008) explores whether health capital formation—investments in health infrastructure and technology—could potentially mitigate Baumol's cost disease. Using a panel of 21 OECD countries, the study, however, finds no evidence that capital formation has fostered significant economic growth in these countries. Instead, it concludes that Baumol's cost disease has not been cured, as rising health expenditures continue to outpace productivity growth, further exacerbating cost pressures in the healthcare sector. Recent data indicates that this issue persists, with healthcare costs continuing to rise rapidly in many countries. For example, an examination of health expenditure in seven OECD countries over the past 50 years shows a sharp increase in healthcare spending, further underscoring the pervasiveness of cost disease in healthcare. The data provides clear evidence that while technological advancements and capital investments have been made in the healthcare sector, they have not been sufficient to overcome the inherent productivity challenges and rising costs described by Baumol's theory.

3. DISCUSSION

Based on more comprehensive data, nearly all OECD countries showed growth in total health expenditure between 1995 and 2012, with the exception of Estonia. The United States remains an outlier, where healthcare costs are significantly higher than in most other countries, accounting for 17.91% of GDP in 2012. During the same period, the countries with the highest growth in healthcare expenditure were Indonesia and Turkey. Simultaneously, there has been growing global concern over environmental issues. In recent decades, problems like climate destabilization and biodiversity loss have intensified. The global ecological footprint has doubled since 1966, now standing at around 18 billion hectares of biologically productive land and water area. Alarming, the Earth's sustainable capacity has been exceeded by at least 50 percent (Knight et al., 2012; Ewing et al., 2010), indicating that humanity is using far more resources than the planet can regenerate. As a result, environmental researchers have increasingly turned their attention to answering whether it is possible to achieve key policy objectives—such as sustainability, full employment, and reduced social inequality—without depending on continued economic growth (Victor, 2008). The central question is whether a modern economy can maintain full employment, mitigate social inequality, and reduce environmental pressures while pursuing a scenario of no growth. If such a scenario is plausible, it would challenge the widely held belief that GDP growth is both a necessary and sufficient condition for societal progress. Instead, it would open the door to alternative economic models that prioritize sustainability and social well-being over relentless economic expansion.

The central argument in the ongoing discussion around economic growth and environmental sustainability is that, given the finite nature of resources, it is impossible for an economy to grow indefinitely. This realization has prompted studies that propose policies and institutional changes compatible with the principles of sustainable development. One of the emerging concepts in this debate is degrowth, which directly challenges the traditional paradigm of continuous economic expansion. Degrowth is defined as a deliberate and socially equitable reduction in society's material throughput—the total flow of energy and resources through an economy (Kallis, 2011; Imran et al., 2022). This process involves reducing resource consumption and environmental impact while maintaining or improving social well-being. From an ecological-economic perspective, sustainable degrowth seeks to achieve an

eventual stabilization of resource use at a level that is in balance with the Earth's natural limits. Degrowth is not simply about shrinking the economy; it advocates for a transformation of social and economic systems to promote sustainability, equity, and well-being without over-reliance on resource exploitation (Knight et al., 2012). The concept of degrowth promotes the idea that it is possible to reduce material throughput while creating a more sustainable and just society. In contrast to conventional growth models, which often lead to environmental degradation and resource depletion, degrowth advocates for downshifting consumption patterns and redefining what constitutes progress and prosperity in modern economies. This shift emphasizes the importance of rethinking how societies measure success, prioritizing quality of life and environmental health over constant economic expansion. In this perspective, the finite nature of resources makes the continued growth of the economy fundamentally unsustainable, and thus degrowth becomes an inevitable process. However, it is crucial to understand that degrowth should not be equated with an economic recession. Instead, it represents a deliberate transition towards a society that operates on less production and less consumption, prioritizing sustainability and well-being over constant expansion. This transition involves a fundamental shift in the norms and values that underpin political, economic, and institutional structures (Wächter, 2013; Schneider et al., 2010). Rather than a reaction to economic crises, degrowth advocates for a proactive change in how societies function, moving away from models that rely on continuous growth at the expense of environmental and social health. The goal is to create a system where well-being and social equity are enhanced within the limits of the planet's resources. Such a transformation requires rethinking core values related to production, consumption, and economic success. It involves redefining prosperity to focus on quality of life, environmental sustainability, and social justice, rather than on the accumulation of material wealth and GDP growth. By promoting a new set of norms that emphasize long-term sustainability over short-term economic gains, degrowth offers a vision of a more balanced and equitable future.

In response to the pressing environmental challenges of our time, a policy package has emerged in the debates, suggesting a range of measures aimed at addressing both economic and ecological issues. This includes policies for implementing a basic income, establishing an effective climate agreement among countries, and creating a flexible labor market that allows for part-time work contracts. Additionally, the package advocates for the regulation of commercial advertisements, the reduction or limitation of environmentally harmful consumption, and technology-specific policies aimed at promoting sustainable development (van den Bergh, 2011b; Kallis, 2011). These policies are intended to help societies transition to a more sustainable economy by encouraging more equitable income distribution, reducing environmentally damaging behaviors, and fostering innovation in green technologies. Victor (2008) uses a simulation model of the Canadian economy to explore the outcomes of different policy scenarios, focusing on the effects of policy changes such as reducing the average work week and cutting greenhouse gas (GHG) emissions. His analysis demonstrates that while a scenario of "no growth" could lead to disastrous outcomes if poorly implemented, a strategy of slow growth, with a stabilization point over 25 years, can be compatible with positive social and environmental outcomes. This finding suggests that gradual, well-planned transitions can help balance economic stability with sustainability goals.

Victor's work highlights the importance of careful implementation in transitioning toward a post-growth economy. If managed correctly, slow growth can align with both social equity and environmental sustainability, preventing the negative repercussions often associated with abrupt economic shifts. This approach, alongside the broader policy package, offers a pathway for reconciling environmental imperatives with economic realities, allowing societies to address climate change and resource depletion without sacrificing long-term social well-being. Although many institutional proposals are discussed within the context of a no growth scenario, this study focuses on two key measures: selective reduction of productivity and reduction of working hours. These proposals are examined within the framework of a no growth model, meaning that income remains constant over time. The idea behind selective degrowth is that different parts of the economy would experience differential growth rates based on their environmental impact. For instance, industries that cause significant environmental damage, such as those related to plastics, heavy metals, or fossil fuels, would see their growth intentionally reduced through targeted policies like environmental taxes.

Environmental taxes can serve as an efficient and effective tool to mitigate the negative externalities caused by such industries (De Mooij et al., 2012). These taxes raise the cost of environmentally damaging activities, effectively discouraging their expansion. As Kallis (2011) notes, many current industries might not have developed as they did if they had been required to account for the full cost of their environmental impacts. Taxes, levies, or tradable permits could make these costs explicit, potentially curbing growth in sectors that contribute most to environmental degradation. However, for environmental policies involving taxes or permits to be truly effective, they require international cooperation and collective action by the world's largest greenhouse gas emitters (van den Bergh, 2011). Achieving such cooperation is notoriously challenging due to the number of actors involved at the global level. To foster this cooperation, Gsottbauer and van den Bergh (2013) argue that a climate agreement must offer reputational benefits and financial incentives while ensuring transparency in negotiations. This way, countries are more likely to engage if the agreement promises clear and mutually beneficial outcomes. For an international climate agreement to succeed, it must also offer credible and cost-effective mechanisms for participation and compliance. Barrett and

Stavins (2003) emphasize that countries are more likely to engage in global climate change initiatives if they perceive the treaty as credible and advantageous. The Kyoto Protocol, for instance, failed to generate significant participation largely due to its lack of incentives for countries to join and adhere to its stipulations. For future agreements to be effective, they must address these shortcomings, providing participating countries with clear net benefits that make cooperation in climate mitigation an attractive and feasible option. In a no growth scenario with environmental policies, industries that cause environmental degradation would see a reduction in productivity, while other sectors of the economy would continue to experience increasing productivity rates. This dynamic allows GDP to remain constant over the years, meaning that wages do not rise. As a result, there is no pressure on wage rates and costs in stagnant sectors like healthcare, which should prevent the sector from being affected by Baumol's cost disease. In this context, stagnation in sectors that rely on human labor, such as healthcare, would no longer experience the rising costs associated with stagnant productivity, as there would be no external pressure to match wage increases with progressive sectors.

Another proposal that has emerged in degrowth debates is the reduction of working hours. Historically, improvements in education, skills, labor specialization, and technological advancements have increased the productivity of labor. However, as van den Bergh (2011) points out, these productivity gains have not been reflected in shorter working weeks, more holidays, or earlier retirement. Instead, they have led to increased production and consumption. Degrowth advocates argue that reducing work hours could help curb environmental pressures by limiting production capacity and consumption. In this scenario, shorter working hours could offer multiple benefits. Reducing the average workweek would not only restrict production and spending power, thereby reducing environmental impact, but it could also improve welfare by providing more time for leisure, family, and personal well-being. Studies have shown that working fewer hours is associated with greater happiness and less work-related stress. For instance, Kasser and Sheldon (2009) found that after controlling for material wealth, the experience of time affluence—having more free time—is positively correlated with subjective well-being. Similarly, Pouwels et al. (2008) demonstrated that longer working hours are often linked with lower levels of happiness.

Further evidence from Alesina et al. (2005) shows that working hours have steadily decreased in continental Europe since 1960, a trend influenced by factors such as strong labor unions, extensive welfare systems, high taxation, and the prevalence of social democratic governments. These factors have also contributed to reduced income inequality. In a no growth scenario, redistributing work and reducing working hours would be essential to preventing unemployment, as Kallis (2013) suggests. By spreading work more evenly and shortening the workweek, it would be possible to maintain employment levels while fostering a more sustainable and equitable economy, thereby addressing both social and environmental challenges. Recent empirical studies have established a clear link between working hours and environmental impact. Nässén et al. (2009), for example, analyzed how changes in work time affect the energy use of Swedish households. Their findings indicate that a 10% increase or decrease in work time results in an 8% change in both energy consumption and greenhouse gas emissions. Similarly, Schor (2005) argues that relying solely on technological innovation will not be enough to achieve sustainable consumption. Through a linear multiple regression of the national ecological footprint for 18 OECD countries, the study shows a positive correlation between reduced working hours and a decrease in the ecological footprint.

Further supporting this connection, Knight et al. (2012) conducted a study using a cross-national panel of 29 high-income OECD countries from 1970 to 2007. Their research demonstrated that a reduction in working hours leads to a significant decrease in ecological footprints, carbon footprints, and carbon emissions. These studies underscore the role that shorter workweeks can play in reducing environmental pressure, supporting the notion that less work can lead to lower resource consumption and environmental benefits. In this context, the role of government becomes essential in promoting a shift toward a different work-time norm. Many people are accustomed to intense labor market competition and long working hours, making a sudden shift in work time challenging. A gradual reduction of working hours, aligned with labor productivity growth, is key to ensuring that such a transition is both sustainable and socially acceptable. By doing so, productivity gains would offset the reduced hours, meaning that total income would remain constant, thus preventing negative economic repercussions.

However, in stagnant sectors like healthcare, an increase in the number of workers will be necessary over time. Since healthcare is inherently labor-intensive and experiences slow productivity growth, maintaining the same quality and efficiency in services will require a larger workforce. In this scenario, even though technological improvements may occur, the human element remains critical to delivering healthcare services, which is why more health workers will be required as the sector grows. Thus, while reducing working hours can mitigate environmental impacts and improve well-being in many sectors, stagnant sectors like healthcare may still face significant labor demands to maintain service quality. With the reduction of working hours and steady income, the wage per hour will inevitably rise. In stagnant sectors like healthcare, where rising wages are not offset by corresponding productivity gains, this will lead to an increase in healthcare costs over time. As new healthcare workers are employed to meet the demand, the relative cost of healthcare will continue to rise. In contrast, progressive sectors—those with increasing productivity—will experience cost reductions. However, because productivity gains in these sectors are passed on to consumers through lower prices, the overall purchasing power of the economy will remain stable. This dynamic means that a portion of

the inputs used to produce goods in progressive sectors will be effectively transferred to stagnant sectors like healthcare. As Baumol (1993) suggests, societies will adjust the proportions of income they allocate to different products and services, with a larger share going to the healthcare sector as its costs rise relative to other sectors. This adjustment is possible because productivity gains in progressive sectors reduce the cost of goods, leaving consumers with the ability to afford more expensive services in stagnant sectors (Nordhaus, 2006). However, the challenge remains that even in a no growth scenario where Baumol's cost disease is mitigated, society will still have to contend with the relative increase in healthcare costs over time. The stagnation in healthcare productivity ensures that its costs will continue to rise, even as other sectors become more efficient. This creates a shifting balance in how resources and income are allocated across the economy, with higher relative spending on healthcare becoming a permanent feature, driven by its labor-intensive nature and slow productivity growth. While purchasing power may remain stable, the relative burden of healthcare costs will likely continue to grow, requiring careful planning and policy adjustments to ensure affordability and access to essential services over the long term.

4. CONCLUSION

Healthcare is often categorized as one of the stagnant sectors, where persistent productivity growth is difficult to achieve due to two primary factors. First, the non-standardization of the production process in healthcare significantly limits productivity improvements. Unlike sectors where processes can be standardized and streamlined, healthcare requires that each case be individually evaluated. For accurate diagnosis and treatment, patient-specific factors must be considered, which prevents the kind of efficiency gains seen in industries where standardized methods can be widely applied. This individualized approach, essential for patient care, limits the potential for automation or large-scale productivity enhancements. Second, in healthcare, quality is closely linked to the amount of labor expended. For instance, a doctor who spends less time examining a patient may be more prone to errors or misdiagnosis. In sectors where labor can be reduced without affecting the outcome, productivity can rise, but in healthcare, the need for adequate time and attention to ensure accurate diagnoses and treatments means that reducing labor input directly impacts the quality of care. This reliance on human expertise and attention makes healthcare particularly resistant to productivity gains, as cutting time or labor would degrade service quality. As a result, healthcare costs tend to rise over time relative to other sectors, even as the overall economy becomes more efficient. This challenge underscores the unique nature of healthcare as a labor-intensive, quality-sensitive sector where improvements in productivity are limited by the need for individualized care and human labor. Baumol argues that in economies with rising productivity in progressive sectors, the costs of stagnant services, such as healthcare, are destined to increase over time. However, this study investigates whether the healthcare sector will continue to suffer from Baumol's cost disease in a no growth economy, where income remains constant over the years. The study explores two scenarios within this context: selective reduction of productivity and reduction of working hours. In both scenarios, the cost disease does not impact healthcare in the same way it would in a growth economy. Without income growth, the wages in sectors with slow productivity growth, such as healthcare, would not be pressured by wage increases in more productive sectors. Consequently, the typical driver of Baumol's cost disease—rising wages without corresponding productivity growth—would be absent. However, in the second scenario, where there is a reduction of working hours, a key finding emerges. The relative cost of healthcare will still rise over the years. Since healthcare is highly labor-intensive, reducing working hours cannot be fully offset by productivity gains in the sector, particularly compared to the economy as a whole. To maintain the quality of care, the number of healthcare workers must increase, which drives up relative costs even in a no-growth scenario. Thus, while Baumol's cost disease may not affect healthcare directly in a no-growth economy, the relative cost of healthcare will likely continue to rise. This occurs because the labor-intensive nature of healthcare means that reductions in working hours necessitate a larger workforce to maintain service quality, leading to higher overall costs for the sector, even without the traditional pressures of rising wages seen in a growing economy.

REFERENCES

- Alesina, A., Glaeser, E., & Sacerdote, B. (2005). Work and leisure in the US and Europe: Why so different? *NBER Macroeconomics Annual*. National Bureau of Economic Research.
- Baltagi, H., & Moscone, F. (2010). Health care expenditure and income in the OECD reconsidered: Evidence from panel data. *Economic Modelling*, 27, 804–811.
- Barrett, S., & Stavins, R. (2003). Increasing participation and compliance in international climate change agreements. *International Environmental Agreements: Politics, Law and Economics*, 3, 349–376.
- Bates, L., & Santerre, R. (2013). Does the U.S. health care sector suffer from Baumol's cost disease? Evidence from the 50 states. *Journal of Health Economics*, 32, 386–391.
- Baumol, W. (1967). Macroeconomics of unbalanced growth: The anatomy of urban crisis. *The American Economic Review*, 57(3), 415–426.
- Baumol, W. (1993). Health care, education, and the cost disease: A looming crisis for public choice. *Public Choice*, 77, 17–28.

- Baumol, W. (1996). Children of performing arts, the economic dilemma: The climbing costs of health care and education. *Journal of Cultural Economics*, 20, 183–206.
- Colombier, C. (2012). Drivers of health care expenditure: Does Baumol's cost disease loom large? *FiFo Discussion Papers*, 12-5.
- De Mooij, R., Parry, I., & Keen, M. (2012). *Fiscal policy to mitigate climate change: A guide for policymakers*. Washington, D.C.: International Monetary Fund.
- Dreger, C., & Reimers, H. (2005). Health care expenditures in OECD countries: A panel unit root and cointegration analysis. *IZA DP*, 1469.
- Ewing, B., et al. (2010). *Ecological footprint atlas*. Oakland, CA: Global Footprint Network.
- Fedeli, S. (2012). The impact of GDP on health care expenditure: The case of Italy (1982–2009). *Working Paper*, 153.
- Gerdtham, U., & Lothgren, M. (2000). On stationarity and cointegration of international health expenditure and GDP. *Journal of Health Economics*, 19, 461–475.
- Gsottbauer, E., & van den Bergh, J. (2013). Bounded rationality and social interaction in negotiating a climate agreement. *Int Environ Agreements*, 13, 225–249.
- Hartwig, J. (2008a). What drives health care expenditure? Baumol's model of 'unbalanced growth' revisited. *Journal of Health Economics*, 27, 603–623.
- Hartwig, J. (2008b). Has health capital formation cured 'Baumol's disease'? Panel Granger causality evidence for OECD countries. *KOF Working Papers*, 206.
- Imran, C. A. B., Shakir, M. K., & Qureshi, M. A. B. (2022). Applications of Artificial Intelligence in Enhancing Construction Safety and Productivity. *The Asian Bulletin of Big Data Management*, 2(1), 63-74.
- Kallis, G. (2011). In defense of degrowth. *Ecological Economics*, 70, 873–880.
- Kallis, G. (2013). Societal metabolism, working hours, and degrowth: A comment on Sorman and Giampietro. *Journal of Cleaner Production*, 38.
- Kasser, T., & Sheldon, K. (2009). Time affluence as a path toward personal happiness and ethical business practice: Empirical evidence from four studies. *Journal of Business Ethics*, 84, 243–255.
- Keenan, P. (2004). What's driving health care costs? *The Commonwealth Fund Issue Brief*.
- Knight, K., Rosa, E., & Schor, J. (2012). Reducing growth to achieve environmental sustainability: The role of work hours. *Working Paper Series*, 304.
- Lago-Peñas, S., Cantarero-Prieto, D., & Blázquez-Fernández, C. (2013). On the relationship between GDP and health care expenditure: A new look. *Economic Modelling*, 32, 124–129.
- Medeiros, J., & Schwierz, C. (2013). Estimating the drivers and projecting long-term public health expenditure in the European Union: Baumol's 'cost disease' revisited. *European Economy, Economic Papers*, 507.
- Nässén, J., Larsson, J., & Holmberg, J. (2009). The effect of working hours on energy use: A micro analysis of time and income effects. *ECEEE Summer Study*.
- Nordhaus, W. (2006). Baumol's diseases: A macroeconomic perspective. *NBER Working Paper*, 12218.
- Pouwels, B., Siegers, J., & Vlasblom, J. (2008). Income, working hours, and happiness. *Economics Letters*, 99, 72–74.
- Schneider, F., Kallis, G., & Martinez-Alier, J. (2010). Crisis or opportunity? Economic degrowth for social equity and ecological sustainability. *Journal of Cleaner Production*, 18, 511–518.
- Schor, J. (2005). Sustainable consumption and worktime reduction. *Journal of Industrial Ecology*, 9(1–2), 37–50.
- van den Bergh, J. (2011a). Energy conservation more effective with rebound policy. *Environ Resource Econ*, 48, 43–58.
- van den Bergh, J. (2011b). Environment versus growth — A criticism of “degrowth” and a plea for “a-growth.” *Ecological Economics*, 70, 881–890.
- Victor, P. (2008). *Managing without growth: Slower by design, not disaster*. UK: Cheltenham.
- Victor, P. (2011). Growth, degrowth, and climate change: A scenario analysis. *Ecological Economics*, 84, 206–212.
- Wächter, P. (2013). The impacts of spatial planning on degrowth. *Sustainability*, 5, 1067–1079.