

Tracing Cyclic Impact of Boom and Recession Periods Correlated to Health Care Markers

-A quantitative analysis of healthcare utilization related to economic boom and bust

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Magisteruppsats 30 hp | Nationalekonomi | Vårterminen 2018



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Abstract:

At the core of this research is the question is: Is recession good for your health? The purpose of the research served to form a theoretical framework to support the concept that recession is not good for one's health, but in fact creates a trend where individuals need health care more than in boom periods. There is also the concern that due to economic downturn even in Nordic nations, citizens do not receive health care out of concern for the expense or detriment to employment. The hypothesis of this research remains: Yes, recession has a negative impact upon health for individuals experiencing such conditions.

The study builds the thesis and hypothesis that recession is bad for one's health due to the extra stress of economic downturn and loss to gross domestic product. The countries included in this analysis were Austria, Belgium, Denmark, Finland, France, Germany, the Netherlands, Sweden, and the United States. Literature and case study evidence supports the connection between recession being bad for an individual's health with regard to how such loss of employment and opportunities also forms gaps between individuals. Literature as well as data results support the concept of recession being bad for one's health because of greater disparity forming in Western nations, but also specifically the United States. Methodology and research design points to a platform design where the approach is strictly quantitative.

Data collection for this project focused on searching the Eurostat and OECD databases within the time range of the recession period where collection procedures focused on gathering information about Nordic countries. The countries included in this analysis were Austria, Belgium, Denmark, Finland, France, Germany, the Netherlands, Sweden, and the United States. Specific variables for testing to prove or disprove the core problem statement focused on Nordic countries' gross domestic product or GDP to be compared with the average amount of physicians visits and income factors for those citizens. By testing for these factors concerning health care trends during recession, one was able to find a correlation between the recession having a negative impact upon health. This indeed tests the hypothesis of: Is recession good for your health? The answer is a definitive: No, recession is not good for your health and in fact, negatively impacts health of individuals experiencing recession.

Innehåll

| | |
|--|----|
| 1. Introduction and background..... | 4 |
| 2. Problem formation..... | 6 |
| 2.1 Hypotheses..... | 6 |
| 2.2 Aims and Objectives..... | 7 |
| 3. Methodology | 8 |
| 3.1 Research design | 9 |
| 3.2 Fixed Effect Model | 10 |
| 3.3 Motivation and philosophy | 11 |
| 4. Literature Review | 13 |
| 4.1 The relationship between gross domestic product and health as wellness . | 13 |
| 4.2 The relationship between recession, incomes, and physician visits | 15 |
| 4.3 Differences between Sweden, Nordic nations, and the United States..... | 16 |
| 5. Findings | 18 |
| 5.1 Methodology and working dataset..... | 18 |
| 5.2 Variables..... | 19 |
| 5.3 Model Specification | 20 |
| Table 1: Descriptive Statistics..... | 21 |
| Table 2: Independent Variables Regressed on HealthSpending | 22 |
| Table 3: Threshold Effect Test..... | 23 |
| Table 4: Threshold Regression Model for European Countries | 24 |
| Table 5: Mean GD..... | 25 |
| 6. Summary | 26 |
| Bibliography | 29 |

1. Introduction and background

At the core of the research is the question proposed by Miller, Page, Stevens, and Filipiski (2009) or: Is recession good for your health? To take a global and generalized view of the issue where one can assume that recession is not good for one's health at all. In fact, the fear and uncertainty associated with the loss of an income can send even the strongest of people into depression or languished state of wellness (Sukreke and Stuckler, 2012). Part of what may be interesting in understanding the last global recession is how individual nations fared in terms of individuals presenting specific health care markers or concrete evidence of the recession negatively impacting one's health. Indicative markers of poor health and reaction to uncertainty presented by recession points to individuals displaying the specific markers of changes in sleep patterns, mental health (including substance abuse), increases or decreased use of prescription medications, and increased or decreased diagnoses of heart conditions, diabetes, and other evidential chronic illnesses.

The primary hypothesis to be tested as a part of this research is: Recession is indeed bad for your health. In fact, recession has a negative impact upon health. The null hypothesis will support that recession or boom does not impact the health and wellness of any individual. One can even argue the basis of the perceived pattern to be based on other statistical variables. It just happens to be a coincidence. However, another issue within the research that arises the noticeable differences between nations with established universal or socialized health care systems when compared with the United States (Ásgeirsdóttir, Corman, Noonan, and Reichman, 2016). The United States was hit hard by recession and just recently adopted Obamacare as reformative policy toward universal health care delivery systems (Shandro, Veiga, Shoveller, Scoble, and Koehoorn, 2011). The assumption remains that the United States will fare poorly because during the Great Recession many individuals could not afford health care insurance and therefore, foregone the expense. One can also tie this behavior to increased medical bill debt collections and even to the prevalence of bankruptcy related to such debts.

Xu (2013) sees the business cycle as defined by periods of boom and then periods of bust or recession. The period of boom will depict increased incomes as higher but also for the middle class American family, increased spending and acquisition of debt related to deregulation lending. The period of bust or recession also show increased reliance on credit card debt and higher rates of bankruptcy related to job loss and health care cost increases. The stress of unemployment or even worse underemployment during the last recession suggests a higher rate of health care issues and conditions emerging during the bust period more so than

the boom period (Shandro et al., 2011). Another argument remains that recession is good for one's health because of increased social services and public policy changes to improve awareness of health conditions that impact the unemployed and lower classes of America (Suhruke and Stuckler, 2012). In other words, there is more welfare programs taking place and individuals collecting unemployment than before, so the recession is actually building commerce even of the poorest as they still must consumer goods and services. One can argue recession presents opportunities to grow business out of other individual's losses. For instance, with so many homes going into foreclosure, there was a pattern of real estate investment that boomed because those members still with cash were able to pick up some deals and then flip them. However, Copeland, Bamba, Nylén, Kasim, Riva, Curtis, and Burström (2015) comment that when comparisons between two nations with strong economies and universal health care because the United Kingdom was hit harder by recession, there are gaps of disparity where the middle class dropped to working poor.

Here in lies the crux of the design for the data analysis of the core question: Is recession bad for your health (Miller et al., 2009). There is the comparing, the pinning of one nation's statistics against another's to promote the connection between recessive downturn with data that supports health issues on the rise (Reeves, McKee, Basu, and Stuckler, 2014). The crux of the design hinges on the comparison of variables between two different nations where one nation is European and supports universal health care and the other is a Western, global leader that has a capitalist blueprint for health care. Yet, in order to support the grandness and generalizable qualities of the question: Is recession bad for your health; one must also consider a global collection of different nations within this defining construct. So, in other words to pit European nations with universal health care. This implies the result will only see how the issue of health builds patterns toward individuals suffering from increased health needs due to recession causing downturn and loss. Pit these European nations against that of data from the United States to test that recession and its fallout has fostered poor health. Yet how does one control the issue of economic disparity without pointing the finger of blame at the recession. The recession caused poverty because there were fewer jobs and people lost their homes. The recession caused people to be sicker than before. These are purely social issues worthy of examination as they connect to economic theory where actions toward building sustainable economic growth are met with challenges presented by people. Whether or not, the actions of people point back to their overall wellbeing in terms of health remains to seen unless the literature supports the theory that economic downturn causes poverty which directly impacts an individual's ability to stay healthy and more importantly,

have access to quality health care (Baumbach and Gulis, 2014; Cawley, Moriya, and Simon, 2015). Cawley, Moriya, and Simon (2015) argue that the recession has nothing to do with people's poor financial judgment or choices but rather, where one is directly affected by the shift in macroeconomics, there is greater damage to the individual in terms of financial wellness. They do not support this impacting emotional or physical health. Further examination of these correlations and theories is extended to the literature review.

2. Problem formation

From the background section, one gathers the skeleton for the framework for forming the reasoning toward answering the core question: Is recession back for your health? It is from this statement, one can gain vision and purpose for parsing out the details of the problem. The researcher in essence also has motivation and investment for answering the core question because of one's career and concern for health care issues beyond one's own place in the world. While one may see definite examples of the recession hitting people hard in terms of health issues and health care use, there is still the desire to design a problem formation tight enough to withstand criticism. There is the desire to see if by answering this question, something for those individuals deeply impacted can change for the better of his or her wellness. For the sake of expanding the research problem also spawns more research questions from which one can start to design methodology. From this point, one can set into place a way to organize the data platform for use in regression analysis. Please see hypotheses below.

Part of what happens in research is that research questions are born out of the core purpose and research problem. The research questions are meant to dig deeper into what can evolve out the research problem. The research problem begins usually, and this is the case with an observation or symptom of a greater issue within a group or process. Here the research problem really serves as thesis statement about if recession affects the health of individuals and if so, how can this proven with statistical data?

2.1 Hypotheses

A hypothesis much like a research problem asks to break down all possible elements of the research purpose to make a clear outline of what needs to be done to reach a valid conclusion. In scientifically controlled studies, many hypotheses start with a known observation and then seek to either prove that observation correct or incorrect. The hypothesis is the way in which the research will ask the research question in a constructed way to seek outcomes. So, the hypothesis will have a null statement to the contrary for what is seen in

observation. In this way, the hypothesis acts as a guide to drawing more conclusions or insights from the observation so the researcher can ask more specific questions that in turn create a measure for solutions. The more one can measure the hypothesis, the more valid the answer will be and then can be applied to solve outcomes from the observation. For instance, if Ball A is able to travel a distance of ten feet in two minutes, but research suggests by adjusting the independent variable, Ball A can travel faster.

While the hypothesis is valuable to creating a format for research inquiry, for more qualitative studies where people become the subjects, research questions serve a greater usefulness as a means of creating instrumentation for carrying out the data collection. The hypothesis for this study is clearly written as: The recession has caused a negative impact to individual health as represented in national data for specific countries selected to support this connection. The recession is bad for your health. Meanwhile the null hypothesis seeks to disprove the hypothesis by clearly stating: The recession has not causes a negative impact to individual health as represented in national data for specific countries selected to this thesis. In fact, the recession does not have any impact, good or bad. To say the recession is good for your health may take the notion of economy opportunity and advantages built out of other misfortune is not purpose of this study.

The hypotheses for this essay are as following:

Hypothesis: To answer the question: Is recession good for your health and to test for this. The hypothesis is: No, recession is indeed bad for an individual's health. There is correlation between the impact of recession on one's ability to stay healthy and this increases one's use of health care systems.

Null hypothesis: To answer the question: Is recession good for your health? The null hypothesis remains: Yes, recession is indeed good for an individual's health. In fact, there is not a correlation between the impact of recession and one's health. Any evidence found is simply coincidental.

2.2 Aims and Objectives

The overall aim of the study is to promote quantitative analysis of statistical data gathered from Nordic nations to support the premise that even in a recession proof environment, the recession still made an impact upon one's health. This analysis can build upon the use of GDP data for each nation with investigation into supporting health care data. This researcher chose the rate of physician visits to explore the connection between recession and health. The aim of the study is to not prove the recession is bad for your health but to

rather offer a supportive framework for further research into the correlation between recession and poor health.

Literature speaks to the connection in a qualitative way where there are interesting bits of evidence to support a social issue in terms of sustainability found within economic patterns for boom or bust. How economics impacts people is of interest to explore and literature reflect strong interest in discussing this social issue. Can one take the social issue and apply this to data in a way to create a definitive conclusion? It is quite possible the null hypothesis is true that the recession is not bad for one's health but rather ignited changes for in socioeconomic growth patterns out the spirit of surviving. However, the core of objective is to support the investigation of the research questions and seek further evidence to support either answer. In supporting the objective of investigating the research questions, one also runs the risk of determining that neither the hypothesis is true.

3. Methodology

Every stage of the project has challenges, but research method can be daunting to define because there is this tangible need to remain within scientific parameters and the desire to uncover evidence that supports specific hypotheses. Any research can be seen as an investigation of sorts, but what becomes interesting at the national level is how every stakeholder within the system will have a similar yet different point of view. Every person who lived through the recession has an opinion about its impact on his or her nation's economy. The inquiry remains founded on the experience of the researcher, but also the inquisitive nature for them to ask the question, see the connection between a pattern and issue without jumping to conclusions. Clearly, there can be an issue with complex problems and solve for valued solutions the more variables are involved, but yet without statistical data, it is difficult to prove the core research question and seek a reasoning for if the recession has a specific impact on an individual's health.

Seeking specific research design is like setting up the rules of conduct for a mission. One wants a clear vision for what is allowed and what is unacceptable conduct. To set into place the parameters for the study means seeking effective tools and resources to pursue a full-scale methodological approach based upon quantitative tools. Part of seeking the correct tool for research design can be found in the literature review. Often researcher sees existing theories and literature as setting into place a storyline, a foundation for credibility, but this will only cover what has happened in the past. This means the level of credibility is only a secondary resource. Looking at literature is not only important to get a sense of what

has come before, but also to examine what methods have been used before and with what results in terms of success. From literature, many other authors have used survey, interview, field testing, and focus groups on seeking data collection, but many that have been successful have used multiple methods or mixed methodology as a means to support the purpose of the study conducted. This one primary reason a strong literature review can be valuable to the process and not only presents theoretical views, but also gathers a foundation for further questioning.

3.1 Research design

Still in seeking a suitable methodology where the focus will be purely upon that of statistics, one can rule out the use of a mixed method in order to allow the process of data collection to form out of applied theory or models seen previously. The study's use of data and specifically seeking to design a platform and database within the Stata data processing program also works to determine how use of any other method style other than quantitative will not work effectively. Research design and instrumentation for the study begins with building the platform for data collection as a model that can be applied to the Stata program easily. Such design also points to the need for clear tools for collecting the data and seeks to support the correct actions for collection efforts.

For the purposes of this research to data sites were used and these sites are Eurostat and OECD. Data could not be collected from a singular site due to the juxtaposition between the European Union nations featured, later to be determined Nordic nations only, and data for the United States context. The countries included in this analysis were Austria, Belgium, Denmark, Finland, France, Germany, the Netherlands, Sweden, and the United States. Here, the researcher found it important to place differences between economic infrastructure in terms of size and location, but also assumptions made about how each nation fared during the recession. The assumption placed upon this stipulation for data collection found that EU or Nordic nations were considered located in northern economies of scale. To compare them with other EU nations found in the south of the region did not seem appropriate. Meanwhile, Nordic nations also have universal health care installed and successful unlike the United States. Southern EU nations also utilizes universal systems. So, to base the study upon the thesis where the recession is bad for one's health, one needed to pull data from EU nations (not found in the Nordic region) that also emulated gross domestic product performances issues similar to the United States. Data for the United States was important to consult as a means for creating a comparison or indicator of trouble for health concerns during recession. In terms of research design, this format for the platform served a

purpose to create separate groups of data where when processed for regression could serve to highlight specific trends meant to point to health issues or concerns.

Now because this is a highly detailed study focused upon Stata regressions and statistical information set into place to form specific patterns of national trends, it is also important to examine the use of the fixed effect model. For the regressions to be effective and support valid evidence toward proving or disproving the core question as well as, seeking to expose gaps in the literature which many be qualitatively based, further discussion of variables selected for the regression are below. In regression, there must also be the control measure or data that presents the threshold of what the trend can withstand before unraveling. The data mined about the United States and recession being bad for health care markers was used mainly because it is important to acknowledge the United States' role in the recession as the place where all the trouble started.

3.2 Fixed Effect Model

The statistical data needed to support analysis of the core question hinges upon the use of the Stata data processing program for completing the regression process. To have effective patterns and insights to data, the regression serves an important purpose to define how variables are set (Allison, 2009). For every study that uses quantitative methods, running the data is a daunting task where there must be set parameters. The fixed effect model seeks to support the use of variables are securely defined and 'fixed' in nature, which also means they traits that are concrete and unchanging. For instance, in demographics, a fixed variable would be race. Determining the role of race in consumer studies toward marketing will suggest there are minute differences in characteristics between one race and another race. The same is true of gender. There is not much one can do to change one's race or gender, so these are considered fixed variables. For this study, a fixed variable to define the parameters of data is time. While time does change in scope as it progresses, it is not really the concept of time that changes but rather one's perception of time. Time will remain constant in relationship to recession variables such as GDP and also health care variables such as rate of physician visits.

To further set up the model once the variables are defined and applied within the fixed effect model, one also sees how in order to have control over what is known at the start of the study (from theory and literature), one must also set specific constraints upon the model in terms of the control measure. In under to see how robust the data can be, there must be a threshold or point where the data is no longer useful as its usefulness has reached the threshold. How much pressure can the data undertake before the data breaks into tiny little pieces. This is a solid image of threshold. Yet, in order to have this threshold set, one must

also provide a control measure of possibly the worst possible impact of the recession. The study uses data from the United States to serve as the control measure because this is the source of the recession and in terms of damage, no other nation sustained greater damage to its economic viability. In fact, the United States is still recovering from repercussions of the recession.

3.3 Motivation and philosophy

When writing and researching a thesis, a project of this size, eventually, during the process, someone will ask: What did you get the idea for the project? What is your motivation and furthermore, how does the research fit with your outlook on the process? What is your philosophy on research especially with regards to global and human concepts impacting us all? To explore one's motivation, one must first put themselves in the role of research. Now many people do not like research or possibly shy away from collecting data. Research and its process unfolds over time. One can start a general view and then peel back layers upon layers of details to reveal a core thread of truth. It is only matter of time. Yet, one must put themselves in the role of researcher to actively embark upon this process where one discovers they may have talent for data. They have talent for uncovering different evidence to support the original research question. The researcher may have talent for making the connection yet still investigating toward the core for understanding the unexpected.

The role of the researcher as the creator of the study begins with observation. Really the first step and responsibility for the validity of the study are that the researcher has observed a measurable and valuable problem possibly within his or her workplace. Over time and experience with seeing this problem over and over, the researcher finally starts reading about the connection between recession and health. The researcher continues to read on the topic has more questions. Still, this is how research begins, and this step is most important in terms of determining if there is a real research problem or just a small issue in the system. Once the researcher can form observable correlations and seek patterns of reasoning toward answering specific questions, then a whole other set of outcomes presents its self in the form of implications.

While there are limitations to the researcher's role and impact upon if data will reflect a valid correlation between recession and health with substance, there is the concern for how seeing this connection changes one's view of his or her own place. For the researchers to turn the research observation into testable variables that can bring about valid evidence to support change is the thing of value for the project. The idea here is that with researcher's actions and purpose of the study also comes a valuable asset to not only the

researcher but to change the system by presenting the problem. It is the job of the researcher to continue pursuing the problem and possible connections to proving that recession is not good for one's health. Of course, in relationship to one's faith in the system, they want to determine it is just a coincidence but, in all truth, the pursuit of the answer will uncover more than what is expected. What is expected remains either yes or no, when really there is a myriad of implications for peeling back all the layers. One wants to keep an open and interpretive view on philosophy which is difficult to do with statistical evidence. One cannot ignore the numbers as representative of what the theories toward recession and health being connected where the individuals suffer negative impacts of shifting economic climates.

4. Literature Review

In the late 2000s, the international financial world went through the greatest economic decline observed since the Great Depression of the 1930s. This period in time is referred to as the Great Recession and was observed explicitly for the first time in the year of 2007, with the crash of the United States housing market. There were several running theories, or “narratives” as to the leading cause of the recession, and most of them placed the blame partially or entirely on the United States. One of the more prevalent themes was the burst of the United States housing market bubble, which was covered extensively in the years after the recession both in documentation and speculation. The effects of the recession were far reaching, far beyond the borders of the United States. Most first world European countries were affected as well, with decimating financial declines across all spheres of banking and national economics. Certain countries were exempt from the recession and in fact boomed financially, such as India and South Korea and though their growth was not particularly noteworthy, it is still worth noting that they managed to completely avoid the effects of the recession.

4.1 The relationship between gross domestic product and health as wellness

Today for areas of the European Union, there are strong economic factors driving the expansion of markets (Erixon, 2015). Erixon (2015) comments many lessons have been learning in Europe since the Global Recession where the model of economic robustness and wellness points to Sweden as a strong leader. While nation has had some areas of weakness found within employment statistics and real estate data suggesting a trend toward the young adult citizen lacking any ambition toward home ownership, there is a strong sense of economic wellness reflected in little change to the country’s gross domestic product or GDP. Where there is strong GDP, there are signs of strong sustainability within the environment where people feel valued but the culture and this reflects in the economic stability of the marketplace (Brydsten. Hammerstrom, and San Sebastian, 2016).

While the data collected by Brydsten. Hammerstrom, and San Sebastian (2016) may make generalized statements about the younger adult just out of university and finding themselves on a path, the lifestyle does not reflect entirely upon the whole population of Sweden. In fact, in terms of being recession proof and health issues, Sweden alongside of other Nordic nations holds a high rate of life expectancy with little change in chronic illness rates (Bartoll and Mari-Dell’Olmo, 2016). In fact, Bartoll, Toffolutti, Malmussi, Palencia, Borrell, and Suhrcke (2015) tested this theory further where there is a noticeable relationship

between GDP wellness and citizen individual wellness and found something curious taking place in other European nations.

Bartoll et al. (2015) found that during recession in mainly southern European nations, i.e. Spain, there were changes in individual socioeconomic status that also directly impacted one's health where qualitative survey of health issues represented a myriad of outcomes. What does this mean? Simply, the Spanish did not do well during the recession and with loss of GDP, there is also loss of jobs where there is increased depression and drug/alcohol abuse. Bartoll et al. (2015) theorized the further one travels north, the better the country fairs in terms of economic fallout from the recession with exception of the Netherlands. Bartoll et al. (2015) and Clair, Loopstra, Reeves, McKee, Dorling, and Stuckler (2016) find the connection between problems paying bills as signifying changes to GDP where the Netherlands saw similar issues in GDP as the United States during recession. Clair et al. (2016) also see a connection between economic downturn, the ability to pay bills, and the rate of health care related statuses increases. This points to either people in Spain or the Netherlands finding reasons to use health care as coinciding with the failure to pay bills. With American case studies for this connection between shifts in GDP and increased health care needs, there is a connection between these behaviors and the increase of depression stemming from the recession and the rate of divorce spiking (Cagney, Browning, Iveniuk, and English, 2014; Cohen, 2014). Furthermore, recession also impacts decisions about starting a family where the new addition is delayed because of tension over paying bills, but yet this stress contributes to depression and increases the need for focus on physical wellness issues (Cohen, 2014; Ensor, Cooper, Davidson, Fitzmaurice, and Graham, 2010).

All of this attention on health care issues and social barriers where the individual blames recession, there is another argument that GDP does not change much but in fact, recession increases the national output (Ariizumi and Schirle, 2012). Ariizumi and Schirle (2012) form the argument that yes, there may be nations that are more resistant to recession than others but that also there are nations who seek leadership during times of bust on purpose. The issue remains that health issues are a fact of life and will happen regardless of changes to GDP and one's employment. The argument remains that economic wellness or lack thereof does not predict the physical, emotional, or mental wellness of the individual but rather, the individual will be sick in any economic climate. It is just the presence of recession that allows for perception to change and shift the blame to the recession.

4.2 The relationship between recession, incomes, and physician visits

For the nations involved with this study and analysis into the overarching question of: Is recession bad for your health? There is also the juxtaposition between Nordic nations and other northern European nations impacted by the recession to consider when viewed next to information about the United States in regard to income and predicted increased health care visits in the form of seeing a physician. For the purpose of seeking the theory applied to comparing the Nordic nations with the United States on a whole, one must also consider differences in health care access and delivery systems (Bacigalupe, Shadidi, Muntaner, Martin, and Borrell, 2016). The fact that many nations suffering from economic downturn also had vast differences in population mass in relationship to physician visits but also the concern that populations shifted to an increase for the United States during this time does not point to failing economic conditions contributing to health care issues (Bacigalupe, Shadidi, Muntaner, Martin, and Borrell, 2016). If the American population increases but the GDP does not, yet, the physician visit is increases, this remains concerning that there is increased burden to the marketplace in terms of increased use of health care. Yet, one can reason the logic remains evident in the increase of population. If there are more people, then there will be more visits?

If population is increasing, or if this is myth, and points to overlap of statistics from a boom period, then this also does not explain why incomes are decreasing with GDP decreasing as well. This may not be true of the United States but case study from the United Kingdom finds that with increased use of the health care system also creates new forms of commerce or growth of industry which serves to balance out the damage done by those industries lost to the recession mainly real estate and banking growth (Astell-Burt and Feng, 2013). The United Kingdom did not see an increase in population unless one counts the immigrant population which also increases the burden on the universal health care system there (Copeland et al., 2015). With increased health care use comes an increase of services provided to the citizen. At least in nations where there is universal health care, this means increased growth in sectors (Copeland et al., 2015).

4.3 Differences between Sweden, Nordic nations, and the United States

Differences in impacts resulting from the recession means different outcomes

for the nations investigated. One distinction found where the United States may have a disadvantage is the issue of social equality and equity. Cohen (2014) discusses the prevalence of increased divorces rates in the United States during recession as evidence of shifting incomes because of downturn. However, one also can argue the United States experienced a shift in social awareness because of the mental realities the recession caused for many families that indeed led to further openness about social values. Divorce cannot be treated as a health care issue but rather any type of data outcome from recession where one can argue this pattern would have existed anyway. The United States remains different from Nordic nations, mainly Sweden in that the economic structure is vastly deregulated when compared with northern European nations. In terms of differences for health care, one can see the connection between stricter controls of laws and systems protect welfare as also having the ability to protect the nation from economic hazards. For Sweden increased regulations and different laws than those in the United States allowed for difference consumer behaviors that did not lead to overspending or risky financial decisions pertaining to employment. Instead, this regulative framework in Sweden created a barrier from economic fallout so the country could resist such influences. Furthermore, one can see how deregulation also caused similar issues for the United Kingdom the same way such behaviors prompted deep economic downturn for the United States.

Other differences further the gap between Sweden, Nordic nations, and the United States in terms of health care access. For the United States evolving within a 'free' and 'open' market based upon capitalism, this means there is not universal health care, or at least at the time of the recession. The issue remains for the United States how to address human right issues at a social level will not harm the free market especially when adopting a model from a Nordic nation will not prompt smooth transition. It is because of differences like universal health care in Sweden that the social issues of equality and equity is not as pronounced as it is for Americans. The issue remains Americans want to address social issues while maintaining a capitalist society, which is impossible (Israel, 2016). The lack of universal health care puts the United States at a clear disadvantage because this means health care is not equal and therefore, the number of visits can be tabulated to reflect population disparity but also social gaps in the system. Israel (2016) comments the recession does impact health care as well as the individual to make a living but to place data evidence upon the

American health care system (at the time) means an unfair advantage to the Swedes. Needs will not be met by the American health care system and where there are increases suggests more visits taking place because Americans fear the amount of debt they will carry for medical costs if they lose insurance cover when they lose employment. Therefore, along the lines of Israel's (2016) argument also justifies the fear the American may have during recession which increases chances of health care issues. However, Israel (2016) sees the clear connection between how when the needs are not addressed the increased burden to social services in the United States. The gaps cannot be filled simply because the American system too broken. So, recession is not good for the health of America's poor or those lower middle-class families working to not fall into poverty. For the American seeking health care during recession the concern is not for the number of visits to the doctor but rather how they will pay for being sick in the form the actual expense of the visit, but lost hours at work. For Sweden, the use of the health care system is not an issue and one does not see too many gaps or trends toward class status or economic wellness playing a role in being healthy (Macassa, Hiswals, Ahmadi, Alfredsson, Soares, and Stankunas, 2014). So, for the American, the recession is bad for their health whereas, for Swedes, the recession does not make much of a difference.

To summate the literature review and understanding how to connect existing work with current research also suggests the disturbance recession causes for many populations with regard to stability and health. This also points to how health care systems are designed and meet the needs of the individual depending upon national location. Specific existing literature points to gaps where there are weaknesses in systems that do not serve the wellbeing of the individual but in fact, work toward creating a system where people lack access. This is primarily seen in the American literature where much of the system is a state of reform. Still such instances found in literature suggest a strong correlation for how recession is not good for your health but in fact, creates further health issues. This alone suggests the research proposed for this essay has merit to explore and create a foundation for a larger scale study in the future.

5. Findings

This section of the paper is the analysis of data regarding the relationship between recession and health. The countries included in this analysis were Austria, Belgium, Denmark, Finland, France, Germany, the Netherlands, Sweden, and the United States. There are two reasons why these countries were chosen for this study. First, there was sufficient data regarding healthcare spending, GDP, and other economic variables for these countries for the period of 2007 to 2012, which covers the years of the global financial recession and the period of recovery that followed. Furthermore, these countries were chosen to allow for a multiple-tiered comparison, both between the United States and Europe as well as Nordic countries versus the United States, and similar mixtures. Nordic countries are famous for their healthcare, both in quality and in political difference from other countries so one would logically expect to see a clear difference between them and other countries. There will also be the comparison of Nordic countries versus other European countries to find a clear difference there as well. The aims of this section are to draw correlations between medical and financial factors in order to find out the causal factors between the two, as well as find out how the beginning of the recession altered both the statistics themselves and the effectiveness of the utilized models.

5.1 Methodology and working dataset

In order to investigate the relationship between health and recession, it was necessary to choose a statistical method that was appropriate to test the relationship between economic conditions and health. A linear regression model could certainly have been used. However, it seems appropriate to assume that the relationship between recession and health may not be linear. Instead, a non-linear relationship may exist in which there is a threshold in personal financial conditions, such as earnings or gross domestic product, that is part of the relationship between recession and health.

Based on the assumption that there is a non-linear relationship between health and recession, a threshold regression model was used for this study. The use of a threshold regression model allows for a better understanding of how economic and financial conditions are related to the health in a country. Rather than assuming that an economic downturn is either always good for health or always bad for health, the threshold regression model allows for the ability to consider how different economic conditions, such as earning higher wages or lower wages, may be related to health because of recessionary periods.

One of the issues that arose in collecting the data for this study was the ability to obtain data for each of the countries included in the analysis for each of the years of interest.

One of the requirements in using threshold regression modelling is that a balanced dataset must be used, which means that there can be no missing data. Unfortunately, some of the variables that were initially chosen to be included in this study, such as length of hospital stay, or tobacco consumption could not be used because data were not available for all of the countries for each of the years of 2007 through 2012. However, variables were obtained that measured health conditions, economic conditions, and individual conditions.

5.2 Variables

The dependent variable for this study was HealthSpending, which was the total health care spending in each of the countries in U.S. Dollars. This variable was used because it was a measure of health care utilization that was available for all of the countries for all of the years of interest in this study. As health care spending is a measure of how much people are utilizing health care systems in a country, this variable is considered to be a valid measure for this study.

Several independent variables were used in this study that measured economic conditions, personal health conditions, and personal economic conditions. In terms of broad economic conditions, the variables of GDP, which was gross domestic product measured in U.S. Dollars, Inflation, which was the yearly percentage change in inflation, and Unemployment, which was the percentage of unemployment were used.

In order to measure personal health conditions, the variable of NumberofDoctorVisits, which was the average number of doctor visits in each of the countries in a given year, was used. In addition, the variable of AlcoholConsumption, which was the average amount of alcohol consumer per person per year in liters, was also used to measure personal health condition. The idea behind using alcohol consumption was that people who are depressed or feeling more stress are likely to engage in increased alcohol consumption.

Personal economic conditions were measured with the variable of LaborProductivity, which was the annual growth rate in labor utilization in the population of a country. The idea is that increases in labor productivity would indicate that more people are working and earning money. The variable of AverageWages was also used, which was measured as the average annual income of people in each of the countries. Again, the idea is that wages may have an impact on larger feelings of stress that ultimately impacts health.

Three control variables were also included in the study. The first control variable was Recession, which was a dummy variable used to measure whether the countries in this study were in a recession in each of the years from 2007 through 2012. The variable

was coded 0=no recession and 1=recession. Two other control variables were going to be used in this study, which were the control variable of European to measure whether the countries were in Europe as opposed to the United States and the control variable of Nordic was used to measure whether the countries in the study were Nordic countries. However, the lack of time variation in those two variables across the six years of data for each country made them impossible to use.

5.3 Model Specification

In order to demonstrate that there is a significant relationship between health and economic conditions, an initial fixed-effects linear regression will be analyzed in which GDP and AverageWages will be regressed on HealthSpending. In addition, the control variable of Recession will be included in order to examine if the presence of a recession in a country has a significant linear relationship with HealthSpending. The basic linear model is defined as follows:

$$\text{HealthSpending} = \alpha + \beta_1 \text{GDP} + \beta_2 \text{AverageWages} + \beta_3 \text{Recession}$$

In order to examine the non-linear relationship between the variables in this study and HealthSpending, a threshold variable and a regime-dependent variable must be defined. Defining the threshold variable requires a consideration of a factor that might impact how people respond to a recession in the larger economy, which, in turn, might affect their health conditions. The threshold variable for the model in this study is GDP because it is assumed that people in countries with different levels of economic output will experience a recession differently. In addition, AverageWages was chosen as the regime-dependent variable because it was assumed that the change in GDP during and after a recession would be related to average wages. The threshold regression model is defined as follows using the coding that was used to run the model in State denoting the regime-dependent variable and the threshold variable:

```
xthreg HealthSpending NumberofDoctorVisits AlcoholConsumption  
Inflation LaborProductivity Unemployment Recession, rx(GDP)  
qx(AverageWages) thnum(3) trim(0.05 0.05 0.05) grid(400) bs(50 50 50)
```

Where: rx(AverageWages) = the regime-dependent variable, and qx(GDP) = the threshold variable

Another issue that must be discussed is the ability to compare the results of the analysis between the European nations and the United States. The use of threshold regression

modelling requires a balanced panel of data. This means that it is not possible to perform threshold regression on the data from the United States only as the data would not be balanced. Furthermore, the lack of ability to use the dummy variable of European to determine if European countries or the United States is a significant predictor on HealthSpending is also not possible. In order to overcome this issue, the threshold data will be used to discuss potential differences between European nations and the United States.

5.4 Analysis

Table 1 shows the descriptive statistics of the variables for the entire dataset. The mean HealthSpending for the countries in the study was about \$45 billion, while the mean number of doctor visits per year was 5.7. In addition, average person in the countries in this study consumed about 10.2 liters of alcohol per year. The mean GDP for the countries in the study was about \$417 billion. The mean inflation for the countries was about 2.1%. The average annual change in labor productivity in the countries was 0.47%, while the average annual wages in the countries was \$46,343.83. Finally, the average unemployment rate in the countries was 6.73%.

Table 1: Descriptive Statistics

| | Mean | S.D. | Min | Max |
|----------------------|----------|---------|----------|----------|
| HealthSpending | 4444.51 | 1294.52 | 2949.52 | 8414.70 |
| NumberofDoctorVisits | 5.71 | 1.86 | 2.80 | 9.90 |
| AlcoholConsumption | 10.20 | 1.61 | 7.00 | 12.90 |
| GDP | 41678.28 | 3983.48 | 34184.42 | 51388.16 |
| Inflation | 2.06 | 1.13 | -0.49 | 4.49 |
| LaborProductivity | 0.47 | 1.69 | -4.66 | 3.91 |
| AverageWages | 46343.83 | 5622.06 | 38205.00 | 57653.00 |
| Unemployment | 6.73 | 1.80 | 2.75 | 9.62 |

Next, the fixed effects linear regression analysis was performed on the entire dataset with both the European countries and the United States. The purpose of this regression model was to demonstrate that there was a significant relationship between economic conditions and health spending. The independent variables of GDP, AverageWages, and Recession were regressed on the dependent variable of HealthSpending. The results of the analysis of variance (ANOVA) were examined in order to determine if the independent variables in the model significantly explained the variance in the dependent

variable. The null hypothesis for the ANOVA was that the independent variables did not explain the variance in the dependent variable. The alternative hypothesis was that the independent variables explained the variance in the dependent variables. The results of the ANOVA showed that the null hypothesis could be rejected, and the alternative hypothesis could be accepted ($F=62.54$, $df=3$, $p<0.001$).

Table 2 shows the results of the fixed effects linear regression analysis. The results showed that the variables of GDP and AverageWages were significant predictors of HealthSpending. In addition, both of the variables had positive beta coefficients, meaning that as GDP and AverageWages increased, so too did HealthSpending. However, the dummy variable of Recession was not statistically significant in the model. This is important because it may indicate that there was not a relationship between recession and HealthSpending. However, this result may also indicate that the relationship is non-linear, which means that a non-linear regression, such as threshold regression, needs to be performed. The adjusted R-squared value for the model was 0.66 or 66%, meaning that the independent variables in the model explained 66% of the variance in health spending.

Table 2: Independent Variables Regressed on HealthSpending

| | Beta | S.E. | t | p-value | [95% Conf. Interval] | |
|--------------------|-----------|---------|-------|---------|-------------------------|----------|
| GDP | 0.11 | 0.02 | 5.87 | 0.00 | 0.07 | 0.14 |
| AverageWages | 0.27 | 0.05 | 5.77 | 0.00 | 0.17 | 0.36 |
| Recession | 14.27 | 56.35 | 0.25 | 0.80 | -99.46 | 127.99 |
| Constant | -12282.29 | 1762.18 | -6.97 | 0.00 | -15838.51 | -8726.07 |
| Adjusted R-Squared | 0.66 | | | | | |

Next, the threshold regression model was performed. The first part of performing a threshold regression is determining if a single, double, or even triple threshold for the threshold variable is needed. In order to determine the number of thresholds, a bootstrap effect test was performed. The null hypothesis for the bootstrap test at each threshold was that there was no threshold and the alternative hypothesis was that there was a threshold. Table 3 shows the results of the bootstrap test for three thresholds. The results showed that the null hypothesis could be rejected at the single threshold, meaning that only a single threshold was needed.

Table 3: Threshold Effect Test

| | RSS | MSE | Fstat | Prob | Crit10 | Crit5 | Crit1 |
|--------|------------|----------|-------|------|--------|-------|-------|
| Single | 1520000.00 | 31700.00 | 18.94 | 0.00 | 13.50 | 16.71 | 18.19 |
| Double | 1190000.00 | 24700.00 | 13.55 | 0.14 | 15.33 | 16.93 | 24.14 |
| Triple | 962000.00 | 20000.00 | 11.20 | 0.72 | 24.32 | 29.74 | 51.25 |

Table 3 shows the results the threshold for AverageWages in the model. The threshold was \$42,058.75.

| | Threshold | Lower | Upper |
|-----|-----------|----------|----------|
| GDP | 42058.75 | 41652.11 | 42585.15 |

Before analyzing the results of the threshold regression model, it was necessary to examine the results of the ANOVA to determine if the independent variables in the model explained the variance in the dependent variable. Once again, the null hypothesis for the ANOVA was that the independent variables did not explain the variance in the dependent variable. The alternative hypothesis was that the independent variables explained the variance in the dependent variables. The results of the ANOVA showed that the null hypothesis could be rejected, and the alternative hypothesis could be accepted ($F=18.99$, $df=8$, $p<0.001$).

Table 4 shows the results of the threshold regression model. The independent variable of NumberofDoctorVisits was a significant predictor of health spending, and had a positive beta coefficient, meaning that as the number of doctor visits increased, so too did health spending. This is not a surprising relationship given that as people visit doctors more often, the amount of money spent on healthcare increases. The independent variable of LaborProductivity was a significant predictor of health spending. The negative beta coefficient meant that as the change in labor productivity declined, health spending increased. Unemployment was also a significant predictor of health spending. The beta coefficient for the variable was positive, meaning that as unemployment increased, so too did health spending. The variable of AverageWages was also a significant predictor of health spending. However, the positive beta coefficient for the variable indicated that as average wages increased, health spending increased.

Table 4: Threshold Regression Model for European Countries

| | Beta | S.E. | t | p-value | [95% Conf. | Interval] |
|----------------------------|-----------|---------|-------|---------|---------------|-----------|
| NumberOfDoctorVisits | 253.74 | 127.98 | 1.98 | 0.06 | -5.56 | 513.05 |
| AlcoholConsumption | 149.15 | 95.16 | 1.57 | 0.13 | -43.66 | 341.96 |
| Inflation | 47.08 | 30.24 | 1.56 | 0.13 | -14.20 | 108.35 |
| LaborProductivity | -40.28 | 21.24 | -1.90 | 0.07 | -83.31 | 2.75 |
| Unemployment | 89.51 | 35.09 | 2.55 | 0.02 | 18.42 | 160.60 |
| Recession | 17.34 | 73.08 | 0.24 | 0.81 | -130.73 | 165.41 |
| <i>_cat#c.AverageWages</i> | | | | | | |
| 0 | 0.31 | 0.06 | 5.04 | 0.00 | 0.18 | 0.43 |
| 1 | 0.32 | 0.06 | 5.23 | 0.00 | 0.19 | 0.44 |
| Constant | -13695.13 | 3123.63 | -4.38 | 0.00 | -20024.20 | -7366.07 |
| Adjusted R-Squared | 0.49 | | | | | |

The results of the threshold regression might seem somewhat contradictory. However, as people have higher earnings, they are more likely to spend more money on their health because they have the money to afford healthcare. This is certainly important in the United States that lacks socialized healthcare. In addition, as unemployment increases, people are likely to feel more stress, so they seek out medical care because they need the care to deal with their increased stress. Furthermore, as labor productivity declines, people are also likely to feel more stress as they may have lost their jobs or fear losing their jobs. In the end, the results of this study indicate that the association between recession and health is that recession has a negative impact on health.

Because of the lack of ability to perform the threshold regression separately on the data from the European nations and the United States, it is worthwhile to use the threshold that was determined from the model to examine how the results of the regression might be different based on the GDP of the countries. Table 5 shows the mean GDP for each of the countries from 2007 to 2012 based on whether they fall above or below the threshold. The United States, The Netherlands, Austria, Denmark, and Sweden had GDPs that were above the threshold, while Germany, Belgium, Finland, and France had GDPs that were below the threshold.

Table 5: Mean GDP

| | Mean GDP |
|-----------------|----------|
| United States | 48776.26 |
| The Netherlands | 45120.71 |
| Austria | 42439.49 |
| Denmark | 42141.92 |
| Sweden | 42030.06 |
| Threshold | 42058.75 |
| Germany | 39930.19 |
| Belgium | 39521.22 |
| Finland | 39261.22 |
| France | 35883.41 |

Based on this information, it might be assumed that people in the countries with higher GDPs had fewer health problems associated with recession as compared to the people in the countries with the lower GDPs. Some researchers have suggested that some countries may be more resistant to recessions than others (Ariizumi and Schirle, 2012). Other researchers have argued that countries that have strong gross domestic products, there are greater feelings of sustainability in the culture that reduces the negative health impacts of recession (Brydsten, Hammerstrom and San Sebastian, 2016). In this regard, it may be that people in the countries with GDPs that were higher than the threshold found in the model have fewer health problems as compared to people who lived in the countries with GDPs below the threshold.

Furthermore, the combination of significant predictors of unemployment, labor productivity, and wages would seem to suggest that the personal economic conditions of people impacts their health when recessions occur. Regardless of whether people live in Europe or the United States, losing a job or even being afraid that a job loss might occur is likely to increase stress and negatively impact a person's health. However, earning higher wages or living in a country with a higher GDP might reduce some of that stress and negative health outcomes because of the idea that the country will survive the recession. In addition, people who have higher wages may have more savings to use if they lose their jobs, so they feel less stress when a recession occurs.

The results of this study provide a different means by which to understand the relationship between economic recessions and health. However, it seems that attempting to generalize the relationship between recessions and health on a national or regional level may miss important factors that impact health during recessions. It may be necessary to focus more attention on the individual level in any country to understand the economic and personal factors that are related to health conditions during times in which people are concerned about the economic condition of a country.

6. Summary

To summate the project and its statistical results as detailed above, there are two valuable pieces of knowledge to discuss from the data analysis that are important to this study. It is important to discuss and summarize these values as contributions to knowledge. As expressed above, the results serve to understand different means ways to connect the impact of recession to health conditions as a national or regional level. The recession creates conditions that impact health during these time frames.

The two valuable pieces of knowledge are simple. First there is a correlation between recession and health where downturn points to negatively impacting individuals. However, this research does not analyze to what extent this connection is true. Next, even with differences in health care systems, Nordic nations are not much different from the United States. However, to mention specific nations does not correlate to the broader views seen in the data. One must look at the data with respect to size and economies of scale. It is comparing apples to oranges. However, the fact remains that these critical pieces of knowledge support the original core thesis even if on a small scale or minor blip in the data. The change is still present and indicative of recession causing an impact on health. On a grand scale of data, it is easy to dismiss but the analysis serves to find the needle in the haystack here. There is a connection.

From the broader perspective, data shows trends toward increased physician visits, and changes (for the negative) to GDP, as well as employment statistics where there is a noticeable loss of economic infrastructure in terms of jobs and growth opportunities, all of which point to a correlation between the recession being harmful on grand scale. In seeing a trend in seeing a trend at the broad level, specifically suffering some level of fallout from the recession also connects the global downturn to even the more formidable nations with the strongest of economic infrastructure (Copeland et al., 2015). In general, one can make the statement that it may be that the recession impacts different regions, and this can include how

the Nordic nations compare to the United States. For Nordic nations to be impacted even on a small scale when compared to the United States case study evidence, one sees how recession marks a pivotal moment in time where every citizen of the world was impacted in some way. Clearly even at the general level of data analysis, one can see how specific nations may have specific behaviors that point to how a general and broad approach to data only highlights what could be going on at the micro level. There is no real evidence at the general level at points to specific nations but just an undertone of what could possibly be happening as an impact of economic forces. Data seeks to connect specific nations where there is more fallout and repercussion, some of which is still being sorted out at the micro level of community economic growth. For Sweden, where universal health care is the norm to be compared with the United States where health care systems are based upon open commerce and capitalism, there is clear correlation even on the small scale of the trend for recession being detrimental to one's health and wellness. This can partly be said because of data analysis supporting the small trend where there is an increased use of health care services at the doctor's office, which further suggests changing patterns to wellness.

Data analysis only offers starting point to inspire future work to focus upon how shifts in GDP and physicians' visits during a bust period in economic history, also points to increased use of health care based upon increased illness exacerbated by fear of loss. Statistics from this study point to the need to further investigate the correlation between how shifts in GDP, as in growing lower, and increased use of health care systems also signifies a loss of growth in terms of infrastructure. Further research should focus more fully on how increased use of health care systems also illustrates a burden to the infrastructure in terms of services and payouts. For future research, it is of interest to determine what weakens the infrastructure of a nation with universal health care (Kiess, Norman, Temple, and Uba, 2017). What health conditions exist and how can the system better work to design systems that balance out covering the needs of people during troubling times.

One of the goals of this research was to not only attempt to answer the core question, but to fully capture a balance of evidence between that of theoretical framework, platform design format for data modelling, and analysis of statistics via Stata regressions. Both the theoretical framework and analysis of statistics support the concept there is a connection between recession and impact upon health. The contrast between that of literature and the data analysis only serves to highlight the gap between health care systems for Sweden and the United States. Differences between the two nations in terms of impact and how the recession compromised growth are apparent, but the human struggle to maintain wellness

remains a common theme of both theory and data application. The overall ‘take away’ from the research supports the connection that where there is economic downturn, individuals suffer the repercussions of such financially poor decisions and as nations somehow slowly pick up the pieces to move forward into a new segment of economic dynamics (Erikson and Hane-Weijman, 2017). However, one cannot ignore the long-term residual effect the recession had upon many parts of the EU and the United States that took years to repair in terms of creating jobs and infrastructure (Buffel, Van Velde, and Bracke, 2015). Many regions of the United States are still playing catch up to larger metropolitan areas where many individuals moved to find jobs. There is also the sense that the health care situation there will only continue to struggle as Americans embrace the concept of universal health care. It is difficult for a society based in open markets and capitalism to shift gears even if the social interest is present for what should be considered a human right. Health care in its measurements where one sees a surge of use remains indicative of people trying to take care of themselves in a world that seems uncertain. The correlation between recession and health care visits serves to show how people took advantage of coverage during uncertain times where unemployment may have meant a change in his or her health coverage or affordability (Godard and Caroli, 2013). The increase of visits may also show an increase in health issues brought on by the recession as many individuals felt troubled by the growing sense of financial collapse. To summate further, while data reflect the blip and trend as being present, it is there, the myriad of literature and those researchers writing about the recession suggest there is more evidence to be revealed. There are not only more stories to be told about surviving the recession, but there is data evidence meant to further explain connections between health and economic trends. This work only serves as the start.

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