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Economics of Suicide: An Intertemporal Analysis

Riya Tewari^{1*}, Mokshita Agnihotri² and Radha P. Tiwari³

¹PG Scholar (Economics), Central University of Gujarat, Gandhinagar, Gujarat, India. E-mail: riyatewari@rocketmail.com

²Legal Associate, India Juris, Mumbai, India. E-mail: mokshita@gmail.com

³Faculty of Economics, HL College of Commerce, Ahmedabad, Gujarat, India. E-mail: radhaptiwari@gmail.com

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Abstract

The existing body of work on suicide has characterized it as a choice opted by an individual who is neurologically disturbed. Adam Smith himself has supported this notion in his book 'Theory of Moral Sentiment'. However, David Hume in his treatise 'Of Suicide' has described it as a rational choice of an individual. This paper views the phenomenon of suicide through an economist's lens. The idea of this paper was conceived from a chapter of the book 'Economics Uncut: A Complete Guide to Life, Death and Misadventure' wherein the writer explains suicide through a microeconomic model. The paper is loosely based on Hamermesh and Soss's study on Economics of Suicide wherein they worked on cross-sectional and time series data of US states to reach the conclusion that the incidence of suicide decreases with rise in permanent income of individuals and increases as an individual grows older. This paper analyzes time series data of suicide in India and attempts to verify the results of Hamermesh and Soss's study. Secondary data from NCRB has been used for the study. The objective of the paper is to better understand the dynamics and trends in suicide in India through economic analysis and find out the underlying causes behind such a drastic choice. The results of our study can add to the existing canon on economics of suicide and can be used for further analysis by upcoming researchers. Through this study we have also attempted to address the research gap in economic modelling of a qualitative aspect like suicide, in Indian context.

Keywords: *Suicide, Economics, Hamermesh, Soss, India, Microeconomics, Qualitative analysis, Time series*

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1. Introduction

Suicide is the act of taking one's own life. According to World Health Organization (WHO) almost 700,000 people die by suicide every year. According to National Crime Record Bureau (NCRB) 164,033 people committed suicide in India and the national suicide rate was 12 per one lakh. The Accidental Deaths and Suicides in India (ADSI) report 2019 specifies the criteria when a death is labelled as a suicide by the Indian Government. They are:

- (i) It is an unnatural death;
- (ii) The intent to die originated within the person;

*Corresponding author: Riya Tewari, PG Scholar (Economics), Central University of Gujarat, Gandhinagar, Gujarat, India. E-mail: riyatewari@rocketmail.com

(iii) There is a reason for the person to end his or her life. The reason may have been specified in a suicide note or unspecified.

Suicide and economics often do not cross paths in traditional literature but there are rationales for delving into the study of economics of suicide. Samuel Cameron has given reasons why economists should indulge in the study of suicide: First, microeconomic theory is founded on a rational choice model that might find the phenomenon of suicide to be an interesting challenge. Second, the marked patterns to be found in the statistics of suicide present a topic for the application of the formidable arsenal of econometric techniques. For example, sociological pioneers in the subject had noticed some degree of correlation of suicide rates with the business cycle. Third, the tools of standard microeconomic theory may also be informative in looking at policy measures toward suicide.

Economists have contributed insights regarding suicidal behaviour. Some economists have gone as far as connecting suicidal behaviour with utility analysis and finding empirical evidence that connects economic phenomena with suicidal behavior. The economics of suicide however remains understudied and still a nascent area of behavioural economics.

2. Literature Review

Durkheim's position on association of socioeconomic actors with suicide is considered a traditional sociological perspective. Thus, Durkheim formulated a theory according to equality in income and wealth was intended to protect against suicide and argued that income inequality makes threats against social integration and results in anomie (Bantjes et al., 2016). The theory of expected utility was the first attempt to order the rules of rational behaviour of individuals. Nevertheless, the assumptions made regarding making purchase decisions started to become more difficult as it was observed that people do not always make decisions objectively and rationally (Ziétarski and Pobočka, 2022). Thus, Kimenyi and Shughart (1986) hypothesized that the expected utility of being alive is positively related to real income and negatively related to loss of income due to unemployment, and therefore suicide rates would be expected to be negatively related to real income and positively linked to the unemployment rate. The integrated motivational model of suicidal behavior suggests that suicidal behaviour occurs as a result of feeling of being trapped; therefore, individuals who feel trapped by life's circumstances and who have no other options for escape use suicidal behaviour as a means of seeking a solution (Bantjes et al., 2016).

Adaptation-level theory proposes that individuals' perceptions and judgments of stimuli are related to their prior experience with them. This previous experience defines a reference point or level of adaptation at which the current level of the stimulus is perceived as exceeding or not compared to it. This raises the concern that the general population may not perceive changes in economic insecurity (stimulus) based on absolute changes, but rather by reference to the regime of economic insecurity in which they occur (reference point), which at the aggregate level defines the prior experience of the population for economic insecurity (level of adaptation). There is micro-level evidence to suggest that adaptation and anticipation of job insecurity play a role in shaping the response of individuals to an increase in job insecurity. In other words, the response of individuals to changes in job insecurity is not based on absolute changes but rather depends on the reference. Thus, it is predicted that if the general population adapts and adjusts its expectations to the economic insecurity regime, one would expect that the increase in economic insecurity that occurs within high economic insecurity regimes would have little effect on suicides, given that they are expected (Abdou et al., 2022).

The economic theory of suicide, established by Hamermesh and Soss in 1974, (HS model), postulates that individuals commit suicide when their reduced lifetime future utility declines below a bearable threshold (Wisniewski et al., 2020). According to Yaniv (2001), the HS model assumes that an individual will commit suicide if his/her lifetime utility at a certain minimum level of subsistence increases, while the discounted value of permanent income over the remaining lifetime declines with one's remaining life expectancy declines, so that each year one approaches closer to the breaking point, plus a utility factor representing his/her "taste for living", to reach zero. Furthermore, Smith (2019) explains the HS model in more detail: Thus, in the HS model, it is assumed that people have perfect information about their future and make perfectly rational decisions. Specifically, individuals calculate the annual utility they will derive from the potential financial costs as well as benefits each year that they will live. These costs and benefits depend on their age, permanent income (e.g., their average annual income during their lifetime), and the costs of staying alive. The only non-economic consideration is a person's "taste for living", which is a constant "defined for the cohort at birth". When the present value of a person's reduced utility flow falls below zero, he/she makes a rational decision to kill himself/herself. The main predictions of the HS model are that suicide rates increase with age and are oppositely related to permanent income (Smith, 2019).

A more focused connection between economic circumstances and destructive human behaviour is provided by the frustration-aggression theory (Wisniewski et al., 2020). This theory proposes the idea that a negative impact on an

individual's economic circumstances can prompt a person to engage in acts of aggression that are often self-directed. Therefore, an improvement in economic conditions reduces the degree of frustration that individuals feel and thus the propensity to harm themselves. This allows for a coherent argument for a link between suicide rates and business cycles (Wisniewski et al., 2020).

When economists talk about economic behaviors, they usually use words such as profit, loss, rate of return, cost, or risk. All these quantities are expressed in monetary terms (Ziêtarski and Pobočka, 2022). One study concluded that two of the seven dimensions that represent differences in people's attitudes towards money are the lack of money as a symbol of failure in life and the feeling of security provided by having money (Ziêtarski and Pobočka, 2022). Considering the materialism that drives value formation in contemporary societies. It is rational to expect that variations in suicide rates are also associated with economic factors and their fluctuations (Kunce, 2022). The paradigm that human behavior is based on rational choice calculus is well accepted by economists and therefore this paradigm has wide applicability in explaining social behaviors, e.g., variation in crime, fertility, marriage as well as suicide rates (Kimenyi and Shughart, 1986). Economic variables like real Gross Domestic Product (GDP) growth and the unemployment rate are identified as important determinants of suicide (Botha, 2012; Claveria, 2022).

Furthermore, it is suggested that the relationship between GDP per capita and suicide may follow an inverted U-shaped curve; with suicide trends decreasing after a certain threshold of economic development is reached. Thus, even though at low levels of GDP, increases in GDP are associated with increases in suicide rates, one time a given threshold of economic development is reached, further increases in GDP are not correlated with further increases in suicide rates. The threshold at which the inverted U-shaped curve begins to move downward can vary depending on specific social, economic and cultural differences within countries (Blasco-Fontecilla et al., 2012). GDP per capita is recognized as an important measure of the overall state of the economy and has a significant impact on suicides (Akyuz and Karul, 2022). Nevertheless, there is a limiting circumstance of GDP as an effective indicator for the economic prospect. Thus, GDP might not reflect real welfare (Akyuz and Karul, 2022) and measure total added value because a significant part of economic activity in developing countries is carried out in the informal sector. More and more body of literature records the relationship between suicide and socioeconomic determinants, e.g., poverty, financial crisis, the condition of owing money and unemployment (Bantjes et al., 2016; Wu et al., 2022).

Suicides are usually linked with recessions and higher unemployment rates (Vandoros and Kawachi, 2021) as well as the announcement of fiscal austerity measures. Unemployment is the most used economic indicator to analyze the relationship between suicide and economic factors (Akyuz and Karul, 2022; Kunce, 2022). Countries belonging to the group with a high suicide rate compared to countries belonging to the group with a low suicide rate according to Mann and Metts (2017) were those countries with lower healthcare costs, a lower at-risk-of-poverty rate, a higher percentage of total unemployment, and higher annual growth rates. The existing literature on the relationship between economic insecurity and suicide points that the threat of losing a job and the associated financial insecurity are powerful enough to cause suicide (Abdou et al., 2022; Vandoros and Kawachi, 2021). At the macro level, economic, socio-cultural, and circumstances factors play an important role in the causes of suicide, like the positive association between unemployment and ended suicide (Iemmi et al., 2016). King (2020) hypothesized that an increase in economic development causes a decrease in suicide rates in countries worldwide. In the opinion of King (2020), researchers nowadays believe that the decision to commit suicide can be an expression of political, social or economic conditions. Furthermore, according to King (2020), the increasing economic development can lead to the carrying out of national mental health policies as well as infrastructures or universal healthcare, which in turn can reduce suicide rates. On the other hand, mental health clinical services and infrastructure are in most cases poor in low-income and middle-income countries since they have lower levels of general economic development (King, 2020). An increasing number of international studies show that rates of suicide are related to periods of economic recession and economic prosperity (Yin et al., 2016). As stated by Stack (1981), the higher the unemployment rate, the greater the financial difficulty and disorders of the person in society and the higher the suicide rate. Kuroki (2010) points out that higher unemployment rates are related to higher suicide rates across countries. Suicide is associated with economic inequalities and economic shocks, and rapid booms and recessions (Bantjes et al., 2016).

In demographic history, the correlation between recessions and suicide is one of the best indicated statistical associations and it is well-recognized that economic crises have an irritating effect on suicidal propensity (Reeves et al., 2014). Thus, in the two regions, i.e., North America and Europe, most affected by the worst financial crisis in 2008, suicides increased noticeably. Unemployment, changing incomes and household debt were posited as contributing factors to the sudden rise in suicides as a result of the European financial crisis in 2008 (Mann and Metts, 2017). The rise in suicide rates during the economic crisis of 2008 had a lot to do with the fear of unemployment and unemployment itself

(Demirci et al., 2020). Additionally, an analysis of the relationship between suicides and unemployment in 27 European countries, found that there were 4900 excess suicides in 2009 compared to the past eight years, i.e., 2000-2007 (Merzagora et al., 2016).

Shah (2011) hypothesized that as the old-age dependency ratio (the ratio of those 65+ to those below 65) increases, there will be fewer younger people available to care for older people and this, consequently, will increase burdening younger caregivers with increased levels of psychiatric morbidity leading to increased suicide rates in population. The main findings of Shah (2011) showed a significant and positive correlation between the old age dependency ratio and suicide rates in both sexes in the population. Using data from the World Health Organization, a cross-national study examining the relationship between suicide rates in the elderly and the old-age dependency ratio found significant positive correlations between suicide rates in both sexes in two age groups of the elderly (65-74 years and 75+ years), and the elderly dependency ratio for men, women and both sexes combined (Shah, 2011).

3. Objective

To verify the results of Hamermesh and Soss’s model in the context of India.

4. Methodology

Secondary data from Accidental Deaths and Suicides in India (ADSI) which is published by National Crime Record Bureau (NCRB) was used for the study. Data of number of suicides by age was taken from 2021- 2001 and a time series graph was prepared.

5. Results and Discussion

Using the above data a time series graph with trendline was prepared which was as follows (Figure 1):

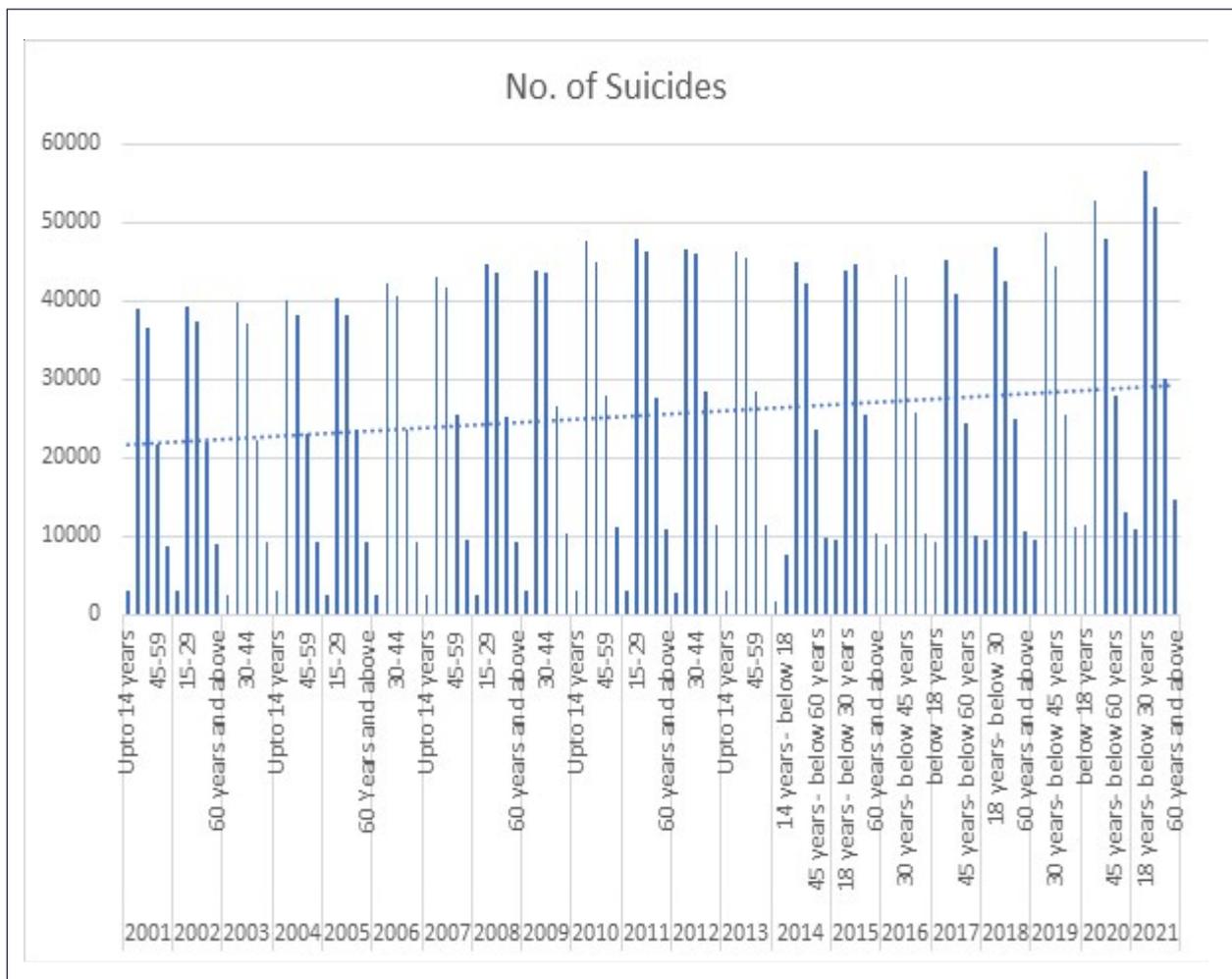


Figure 1: Time Series Graph

According to Hamermesh and Soss's findings suicide rates tend to increase with increasing age. They worked on data of US states which included suicide rates of last 20 years.

But results from our study paint an entirely different picture. From the time series graph it can be observed that data is skewed in favor of the population of age group 18-30 years and suicide rates among the elderly, i.e., the age group of above 60 is the lowest thereby giving us some new insights into the Hamermesh – Soss model.

6. Suggestions

The Hamermesh-Soss model could be explored further in the context of India through econometric methods. Data of suicides with respect to income groups in India can be considered to test the results of the Hamermesh – Soss model more accurately.

7. Conclusion

We can conclude that the Hamermesh – Soss model and the field of economics of suicide in general in the context of India has ample scope for research to achieve meaningful empirical results.

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