RESEARCH REPORT

DOES INCOME BRING HAPPINESS? AN EMPIRICAL ANALYSIS USING PSEUDO-PANEL DATA FROM BANGLADESH

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List of Acronyms

GNP   Gross National Product

WVS   World Value Survey

HPI   Happy Planet Index

WHS   The World Happiness Survey

GDP   Gross Domestic Product

HDI   Human Development Index

GSS   General Social Survey

OLS   Ordinary Least Squares

VIF   Variance Inflation Factor

OAA   Old Age Allowance

Acknowledgements

Abstract

Bangladesh is one of the emerging developing countries in the world, with a large number of populations living below the national poverty line. However, recent research identifies that people in Bangladesh enjoy a higher level of happiness, despite their low income, compared to many other countries in the world with high per-capita income. This study explores this dilemma by identifying the correlates of happiness through analysing quantitative data from the World Value Survey (WVS). Both cross-section and panel analyses have been employed to identify the effects and changes, over time, in happiness in Bangladesh. The results from the empirical model, based on cross-section and pseudo-panel, suggest that income is one of the core determinants of happiness. People do care about their social class and relative social position in the area they live. Besides, the effects of variables such as freedom of choice and individual's health status are strong variables that influence an individual's happiness at a point in time and over time. Therefore, it is supported by this research that money can buy happiness in a country where the fulfillment of the basic needs of a majority of the population is a principal cause of concern. The ability to meet basic needs significantly improves individuals' level of happiness. This conclusion gives the answer to the paradox of rising happiness in Bangladesh in the era of economic growth and prosperity.

Keywords: Happiness, Poverty, Pseudo-panel, Developing countries, Bangladesh.

CHAPTER 1

INTRODUCTION

1.1 Background

The primary focus of modern economic policymaking is the attainment of material well-being. Consequently, the development progress of any country is, to a great extent, defined by its rate of economic growth and its level of income. Although increased material wealth does allow individuals to enjoy a higher standard of living, it is not a panacea for improving well-being; because the very process of economic growth engenders problems like food insecurity, environmental degradation, socio-political conflict and so on. Therefore, as Sachs (2012) argues, financial or material gains alone cannot address the well-being of society.

As an example, the world's most powerful country, the United States of America, has succeeded in achieving rapid economic growth with the help of advanced technological progress. But it fails to show similar progress in the level of happiness of its citizens. The reported level of happiness dropped over the last quarter of a century because of high inequality, low social trust, uncertainty, discriminatory policy for females and racial groups, and lower level of confidence in governments (Blanchflower and Oswald 2004). These realities slowed down the potential rising tendency of happiness with a rise in Gross National Product (GNP). Similarly, in the United Kingdom, the average happiness score has remained stable over time despite the increasing material prosperity. In the early 1970s, one-third of British people defined themselves as very happy, while in the late 1990s, the number remained stable due to a large rise in unemployment and a fall in marital rate (Blanchflower and Oswald 2004). This understanding of overall well-being as a societal goal that transcends material wellness poses questions on whether certain factors can systematically influence the happiness of different individuals, and, if they do, whether there is a role for public policy favourably affect these factors.

The significance accorded to material gains may vary depending on the situation of the economy. In the case of indigent societies, lack of adequate food, shelter, health care, access to water, sanitation, education, etc. necessarily implies that material gains are valued highly. Any increase in income from a low level will improve their well-being by contributing to improving these basic amenities. Thus, it is not a surprise poor people living in such a society report a higher level of satisfaction with rising income.

The story is different for the opposite end of income distribution, where there is enough food, shelter and basic facilities beyond the threshold of basic needs. Having more money to meet any needs, such as a house, brand new car, etc., can make

individuals feel happy for a short time. But as soon as the desire of having more things increases, they need to buy some more to become happy again. Over time, 'the conditions of affluence have created their own set of traps' (Sachs 2012:4). Therefore, higher income does not necessarily lead to well-being after crossing a certain income threshold. It is known as the global happiness puzzle called the *Easterlin Paradox.* Easterlin (1974) noticed that rich people are usually happier than poor people. But once the economy starts growing, its level of happiness does not grow concurrently because of the rise in comparison and aspiration among individuals. Comparison effect can be defined as individual comparing their income with others to evaluate their relative positions in the society, thereby, using this as the basis for defining their level of happiness. In making a judgment about the relative position, how much an individual makes compared to others matters more than his absolute level of income (Easterlin 1974). On the other way, an increase in an income simultaneously raises material aspiration that works against happiness to offset its initial rise for high- and lower-income individuals. The negative effect from aspiration undercuts positive effects from income (Easterlin 2001), Thus, weakening the relationship between happiness and income over time.

Surprisingly, Bangladesh, one of the poorest countries in the world[1], is considered one of the happiest countries in the world by most research. Worcester (1998), a pioneer in this sub-discipline, examines survey evidence on happiness for 54 countries, including Bangladesh using data from the World Value Survey (WVS) of wave 1994-1999. Ranking of these countries based on the percentage of people reporting themselves as '*happy/very happy*' affirms the widely held belief that high-income countries are happier, for 17 out of the top 20 happiest countries are the so-called rich countries. Bangladesh does fairly well on this ranking list at 22, but what is most surprising is that once the author controls for income, Britain, which previously ranked 9, slips to 34th place. And Bangladesh, along with Azerbaijan, Nigeria and the Philippines, emerges among the happiest countries (Worcester 1998).

The World Happiness Survey (WHS) also compares the distribution of happy people in a country with per capita income. They also report that Bangladeshis derive far more happiness from their small income than any other people in the world.[2] At the same time, they acknowledge the importance of income for people in poor countries rather than in rich countries. As income is to elevating the crucial

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[1] Per-capita GDP of US$ 1,700 (PPP) in 2011 along with a Headcount poverty rate of 31.5 per cent at the national level, among which 17.6 per cent are extremely poor (Bangladesh Bureau of Statistics 2010).
[2] London School of Economics and D. Richard Layard together did a survey in 2005 for the research titled 'Happiness: Lessons from a New Science' called The World Happiness Survey (WHS). The study revealed that although Bangladesh is considered one of the poorest countries in the world, its people derive far more happiness from their small incomes than any other people in the world with relatively large bank balances (i.e., United Kingdom listed 32nd).

impoverished people from absolute poverty, the effect on happiness would be higher in the poorest countries than in the richest countries (Layard 2005).

According to Happy Planet Index (HPI 2016), Bangladesh is the 8th happiest country out of 140 countries, based on the index consisting of four criteria namely life expectancy, well-being, ecological footprint, and inequality.[3] Although Bangladesh ranked among the top 20 countries, the progress is not satisfactory in the criterion of reported well-being. The expected well-being is recorded as 4.7 on a ladder of 10, lower than the world's expected average well-being of 5.1 (HPI 2016). The well-being score of 4.7 implies that the majority of the individuals placed them in the middle of the ladder of a happy life (see Appendix Map A.1). Therefore, when the low income of Bangladesh is compared with its level of happiness, Bangladesh scores relatively high in happiness ranking compared to high-income countries. It indicates that poor people may be happier with having other non-material things, such as family, freedom, personal values, and creative activities, which they value (Layard 2005). These factors may be playing an important role in individual happiness even in a society where basic needs for a secure life are rarely met. On the other hand, when only happiness level is compared, the ranking of Bangladesh is not satisfactory compared to other countries.

As the sources and evaluation techniques are different, it may not be possible to assess overall trends in happiness by juxtaposing different studies. There are not many rigorous studies. If we evaluate the estimation techniques, most follow exploratory data analysis by using descriptive statistics and graphical tools, etc. Worcester (1998) ranks selected countries based on comparing percentage of happy people, Human Development Index (HDI), and Gross Domestic Product (GDP), while HPI (2012) is based on three index criteria, namely life expectancy, well-being and ecological footprint. Layard (2005) makes a cross-country analysis on the average of per cent of '*happy*' and per cent '*satisfied*' people with per capita income.

The results reflecting Bangladesh as one of the happiest countries seem counterintuitive considering its socio-economic and political situation. Along with low income, it is a country with the highest corruption level (Appendix Map B.1)[4], where corruption prevails not only in the public sector but also in social sectors (Nabi *et al.* 1999) to make public service systems, such as health and education, the major cause of concern of the government. Besides this, discrimination against women is a

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[3] The Happy Planet Index (HPI) is a measure of efficiency, which captures the degree to which long and happy lives are achieved per unit of environmental impact. The Index is based on the number of Happy Life Years achieved per unit of resource use. This is approximated by dividing Happy Life Years by Ecological Footprint. Happy life year is the combination of life expectation and experienced well-being where well-being is assessed using a 'ladder of life' where 0 is the worst possible life, and 10 is the best possible life (HPI 2012).

[4] According to the report of Transparency International Bangladesh (2012), Bangladesh is the most corrupt country in the world. The ranking has continued for the last five years and it is still maintaining the same top position. Source: www.transparency.org/cpi2012/results.

widespread and systematic phenomenon all over the country through different kinds of violence, from 'wife abuse to rape, dowry killings, acid throwing, sexual harassment, and sexual slavery through international trafficking' (Zaman 1999).[5] At the same time, political instability, price hikes and the growing unemployed population (see Appendix Table B.1) are also considered its general fate. As a country's socio-economic context matters for its happiness (Frey 2008), the above realities could also affect the happiness level of Bangladesh.

Although a vast literature argues that income is a key determinant of happiness, especially in impoverished societies, Bangladesh's relatively greater level of happiness poses a challenge to this widely held belief. However, the importance of income in affecting happiness cannot be overstated, because per capita income, which is a key indicator in Bangladesh's happiness puzzle, masks variations in happiness at the individual level.

1.2 Rationale

There has always been a curiosity to figure out the factors in an individual's life that affect their happiness. It is an age-old debate whether income and wealth are the only criteria that matter when determining happiness level, or whether other factors are taken into account as well. Increasing the happiness of a country's population is a long-term goal in which policymakers seem to be keenly interested. Thus, several studies have been performed in various countries over the years to determine the factors that have had a significant impact on the happiness of individuals.

In the context of Bangladesh, the motivation for examining country-level happiness rather than individual happiness stems from presumably contradictory remarks of a high level of happiness in a low-income country like Bangladesh. There have been extensive debates about the correlates of happiness in poorer nations. This study seeks to unveil which of these conflicting ideas hold in the case of Bangladesh by using WVS data to measure the correlates of happiness. Though previous research in Bangladesh solely used cross-sectional data, this study not only uses cross-sectional data to evaluate people's happiness at a single point in time and pseudo-panel data to examine how happiness has changed over time within a single country.

1.3 Objectives

Following the background above the primary objective of this study is to find out the correlates of happiness in Bangladesh that encourage people to lead a happy and satisfied life even after facing hardships in daily life. At the same time, it is necessary to know whether factors such as income, social status, relative position in society,

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[5] It is well established by the literature that women are the target of everyday discrimination, exploitation and violence. See also Arens and van Beurden (1997), Jahan (1994), White (1992) and Zaman (1996).

marital status, health status, employment status, age, and freedom of choice, among others, influence people's feelings of happiness in the country. Therefore, this study examines both income and non-income correlates of happiness. Moreover, this study also aims to unravel the mystery of the people of Bangladesh being happier than people in other countries, despite it being a relatively poor country.

1.4 Methodology

This research uses cross section and panel data to determine the correlates of happiness utilising the secondary data from the World Value Survey (WVS). At first, individual cross-section data is used to identify whether there is any link between the difference in income and other traits of happiness. Then, an ordered probit model has been used to identify the relationship between income and happiness. However, it would be interesting to know how much of this cross-section variation in income and other traits contributed to changes in happiness over time.

For doing this kind of exercise, this study feels the need for a panel data set. The data set that comes will be through the survey of a different individual in each survey year in Bangladesh. So, the opportunity to observe the same individuals over time has been missed. Hence, a pseudo-Panel data set has been constructed by tracking groups of individuals, called cohorts, from repeated cross-sectional surveys to build a substitute data set for true panel data set.

1.5 Data Limitations

This research faced some limitations due to the unavailability of recent data. As this study uses secondary data from the World Value Survey (WVS), we only two waves of data sets are available for Bangladesh. The first wave (1994-1999) was collected in 1996 and the second wave (1999-2004) in 2002, with a sample size of 3,025. Though the dataset is old, it is the most comprehensive data set available for Bangladesh with a range of information regarding a household's socio-economic information and demographic characteristics, information regarding individual's perception about life and political view, religious orientation, and his/her level of happiness, etc.

If provided with more recent data, there is a vast scope of further study on this subject matter regarding other factors that might have effects on individual's happiness, which are not explored in this paper.

1.6 Major Findings

The results primarily show that there is a positive and highly significant effect of income on happiness in both 1996 and 2002, even after controlling for other factors. The social status of an individual and an individual's relative social position also influence individual's level of happiness and income.

The results also demonstrate the statistically significant effects of other variables, such as: individual's health status and freedom of choice, on an individual happiness. The cross-section analysis confirms that income classes, social classes, relative social position, freedom of choice, and health status of an individual are the core determinates of happiness.

The pseudo-panel analysis also supports the results from cross-section analysis. Changes in the five determinants from cross-section analysis produce a similar effect on changes in happiness. The positive effect income classes explains that graduation within income classes increases the proportion of happy people within a cohort. Social classes, relative social position, health status and freedom of choice, among other variables, also exhibit a similar pattern of effect on changes in happiness in an individual over time.

To summarise, this research finds similar results as found by several other authors that income is a very important determinant of happiness in an individual's life.

1.7 Layout of the Research Paper

This report is structured as follows. After the introduction in Chapter 1, Chapter 2 conceptualises the concept of happiness and discusses the sources and techniques used for measuring happiness. It also provides a review of the research done on happiness in Bangladesh. Chapter 3 presents an empirical framework and specification for analysing the correlates of happiness in Bangladesh. Chapter 4 describes the data measurement-related issues, while chapter 5 analyses the results of the econometric model. Chapter 6 summarises this research and concludes.

CHAPTER 2

BACKGROUND AND THEORETICAL FRAMEWORK

The pursuit of happiness is the ultimate goal of human behaviour. It is crucial not only for understanding human behaviour but also for understanding social interactions and aggregate social outcomes (Wolbring *et al.* 2013, pp. 86). Hence, many researchers have been studying this issue over the last two decades to discover the determinants of happiness. This chapter starts with conceptualising the idea of happiness, followed by a discussion on how happiness is measured so far by the researchers using different techniques and data.

2.1 Happiness: Origin and Evolution of the Concept

The concept 'happiness' was traced first in the discussion of Aristotle in *eudemonia,*[6] where he opposed the general belief that happiness is the outcome of pleasure derived from an individual's body and material possession. According to Aristotle, the constituent parts of happiness are: 'good birth, plenty of friends, good friends, wealth, good children, a happy old age and also such bodily excellences as health, beauty, strength, large stature, athletic powers, together with fame, honour, good luck and excellence' (Aristotle, Rhetoric 1360 as cited in Helliwell 2003). He emphasised long-term righteous activities that add to the lifelong satisfaction of the individual and require an adequate supply of material goods to sustain (ibid).

Recent studies perceive happiness as a positive self-reflection of individuals through evaluation of his or her own life. When asked to evaluate the level of happiness, he or she need to apply a greater sense of judgment on all pleasant and unpleasant experiences from the recent past. Then make an overall evaluation of his or her level of happiness (Fordyce 1972). Layard (2005) provides a simple definition of happiness: it means 'feeling good, enjoying life and wanting that feeling to be maintained.'

While this definition renders happiness as a temporary feeling, Diener *et al.* (2009: 8) take a long-term view: "happiness is a state of contented pleasantness and is one of many specific emotions that people can feel in response to life events and daily experiences." Other authors also define happiness across the lifecycle of an individual: Brule and Veenhoven (2012) and Veenhoven (1984) define happiness as a measure by which people positively evaluate their overall quality of present life as a whole. Sen (2003) defines happiness as 'human flourishing,' which originates from the implementation of abilities and opportunities, enabling individuals to meet their basic necessities.

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[6] Stanford Encyclopedia of Philosophy (2010) 'Aristotle's Ethics'. Accessed 10 September 2013 <http://plato.stanford.edu/entries/aristotle-ethics/>.

Therefore, happiness is not just the result of recent, transient experiences. It also reflects of 'circumstance, aspirations, comparisons with others and individual's base line happiness or dispositions' (Warr 1980 as cited in Gardner and Oswald 2001:2), which is strongly influenced by individual's long-term experiences and perceptions about their quality of life. The 'happiness' that we refer to in this report is closely related to life satisfaction; it is individuals' own assessment of their well-being and collective expression of their quality of life that is not domain-specific.

2.2 Measurement Scales, Methods and Related Problems

Over the last few decades, happiness research has been in the limelight due to increase interest shown by psychologists, sociologists and, more recently, by economists. Psychologists measure happiness from the response of individuals' feelings that come through a physiological assessment done by trained clinicians (Diener 1994). The measurement is done based on some popular scales such as: Affect Balance Scale by Bradburn (1969), Satisfaction with Life Scale by Diener *et al.* (1985), Delighted-Terrible Scale by Andrews and Withey (1986) (Lyubomirsky and Lepper 1999). On the other hand, sociologists mainly rely on qualitative data based on open-ended questionnaires about individuals' feelings and their subjective experiences in other domains (Bartram 2012). Although some researchers have been started using quantitative data (e.g., R. Venhoveen), the analysis is still done based mostly on exploratory data techniques such as descriptive statistics, graphical presentation, correlation matrix, etc. Economists are mostly interested in determining how to measure individual happiness and the factors (particularly money) that influence it. (e.g., Diener and Biswas-Diener 2002). Although, in some cases, the qualitative responses are taken into consideration, the measurement is done on quantitative data using rigorous econometric techniques.

Individual happiness in economics research is generally conducted based on survey information, which measures happiness on a discrete scale ranging from 'not at all happy' to 'very happy' with a value of 4 to 10 classes, depending on the survey methodology (Maggino and Schifini D'Andrea 2003). Respondents asked to answer the question: 'taking everything into consideration, how happy do they feel with their life as a whole?' Researchers sometimes capture individual's overall well-being of the individual either through happiness reported on a single or several domains like income, work, health, education, leisure, and so on (Kohler et al. 2005). But common practice is getting information on several domains, each considered separately and linked the overall happiness of individuals (e.g., Van Praag *et al.* 2002, Nieboer *et al.* 2005).

So far, economists have usually linked individual happiness with objective indicators like income, consumption, economic growth, etc., in an attempt to understand how these variables relate to happiness in a cross-country or within-country

perspective. Among these indicators, income and economic growth are the two indicators that are commonly examined by researchers using data from different countries and different sources. For example, Easterlin (1995, 2001) and Blanchower and Oswald (2004) used data of General Social Survey (GSS) of the United States, Di Tella, MacCulloch and Oswald (2001) used data from Euro-Barometer Survey Series of EU member countries and Frey and Stutzer (2000) from Switzerland collected by Leu *et al.* (1997).

The techniques used by these papers are also different from each other. Blanchower and Oswald (2004) estimated a happiness function using ordered logit specification with appropriate control of individual characteristics such as gender, marital status, education, race, etc., with time dummies. Di Tella, MacCulloch, and Oswald (2001) used a two-step methodology to estimate a life satisfaction equation. In the first stage, they estimate a life satisfaction equation using OLS for each country, and in the second stage, they use the residual (unexplained component of life satisfaction) obtained from the first stage as a dependent variable to calculate the effect of unemployment and inflation on life satisfaction. Frey and Stutzer (2000) use a weighted ordered probit model to estimate the impact of demographic, economic and institutional factors on happiness. They use the individual income scale as a main explanatory variable with controlling an individual's age, gender, education, marital status, and employment status. Although the techniques are different, these papers draw the same conclusion. At a given point in time, on average the richer countries are happier than the poorer countries. It makes sense intuitively since higher income means the availability of more opportunities in life.

Easterlin (2001) found a highly significant correlation between income and happiness though small in magnitude i.e., only 0.20, which further weakened controlling after socio-demographic characteristics. The low correlation might mean that other factors are important for an individual's happiness more than income. The impact of other factors on happiness rather than just income alone was also found by Frey and Stutzer (2002). These other factors included better health care, assurance of basic human rights and stable democracies that people to live a healthy and happy life.

Inglehart *et al.* (2000) used two-year data of 51 countries from the World Values Survey (WVS) to elucidate the relationship between per capita income and happiness. They found that people in a country with higher per capita income reported a higher level of happiness than people living in a country with a lower per capita income, which, in turn, suggests that the richer countries are happier than poorer countries.

Although there is a consensus of a positive correlation between income and happiness among most researchers, correlation does not necessarily mean causation. It is quite possible that happier people can earn more than people who may be the ones experiencing increased happiness. The direction of causality has been examined by

some researchers: Smith and Razzell (1975) and Gardner and Oswald (2001). They used longitudinal data from the British Household and Panel Survey (PHPS) to determine the effect of monetary windfalls from winning on football betting (Smith and Razzell 1975) or from lottery wins and inheritance gains (Gardner and Oswald 2001). Although Smith and Razzell's study only used one cross-section, Gardner and Oswald took advantage of the whole panel by using a first difference well-being model controlling for time and personal characteristics such as gender, race, religion, education, etc. Their study results support the direction of causation from income to happiness.

We must be borne in mind that the growth in absolute income needs not to lead to proportional growth in happiness over time. In fact, absolute income has diminishing marginal utility. Using the data of Europe from the Eurobarometer Survey, Di Tella *et al.* (1999) showed that a rise in the income equally improves the level of happiness for the poor people while an equal amount of increase in absolute income has a relatively small effect on the level of happiness for the richer people. Diminishing returns set in once basic needs are met, in other words, after crossing the threshold of basic needs, additional income contributes marginally or does not contribute at all to an increase in happiness level (Venhoveen 1992). Even movement in income distribution from lower to higher decile increases happiness by a smaller amount (Helliwell 2001). Inglehart (2000) said that the effect of income on happiness depends on a country's development stage. If a country is at an early stage of development, a small change in income results in a large improvement in happiness. But once that country crosses a certain threshold of income, the demand for a better quality of life negatively affects further increase in happiness (Clark, Frijters and Shields 2008).

Although some of the research supported this non-linear relationship, Easterlin (1995) challenged it using the example of Japan. Japan was on the list of one of the poorest countries in 1958. After that, its economy starts growing from a low-income level without influencing its level of subjective well-being. Again, this issue has been analysed carefully by Easterlin (2004). His main conclusion is that in the case of diminishing marginal utility of income, a cross-sectional relationship is not a reliable way to guide the temporal relationship or is even not reliable to make any inference about policy.

However, the positive impact of income on happiness is commonly accepted by most economists' evidence from longitudinal data does not seem to support the same results.[7] Evidence shows that, over the last decades, there has been a sharp rise in per capita income in many countries like the United States, the United Kingdom, Belgium, and Japan. But compared to the growth of per capita income, the average level of happiness has not changed much. In some countries, the response remains constant over time.

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[7] For example, see Easterlin (1974, 1995), Kenny (1999), Blanchower and Oswald (2000), Diener and Oishi (2000).

Among studies that analysed panel data, Ferrer-i-Carbonell (2005) worked with the largest panel of six years from the German panel data of 1992 to 1997. He argued that although income has little effect on happiness than other objective variables, it is significant. The marginal effect of income is larger in East Germany compared to West Germany, which makes sense intuitively as the former is poorer than the latter. Two interesting conclusions can be highlighted from the study: one is for the poor, happiness is negatively influenced by the fact that they have low income compared to their reference group.[8] Comparison against perceived reference group matters in the sense that if income increases compared to those in the reference group, the level of happiness of that individual also increases. The rich, on the other hand, are not getting any happier as a result of their higher-than-average income.

This is called the 'happiness paradox' we have mentioned earlier. Why do we observe this paradox? It is because often individuals make judgments about their lives based on their past experiences and their expected future. Their assessment could be based on a comparison of their current situation to the past, a comparison of themselves to others, or a combination of the two. Although people usually derive utility by comparing themselves against neighbours, such relative comparisons negatively affect happiness by forming a higher level of expectation, raising the level of aspiration and, thus, producing a process of adaptation (Easterlin 1974). Expectation usually grows proportionately with income, while aspiration mediates the effect of income. Thereby, the net effect becomes much stronger at the lower end of the income scale, where both expectation and aspiration are low (Veenhoven 1991). The net effect is weaker towards the upper end of the income scale, which the researcher defined as the wealth effect, which is articulated through greed or a shift in preferences over time (Argyle 1999).

Besides income, cross-country studies have also been conducted on happiness using indicators like unemployment and inflation (Di Tella, Macculloh and Oswald, 2001). Using panel data from the Eurobarometer, they measured the effect of unemployment and inflation on the predicted level of happiness. The construction is done based on the value of residuals obtained from the regression on microdata to calculate the proportion of happiness that is not related to individual characteristics. A similar technique has been used by Guo and Hu (2011) for identifying the determinants of happiness from the US General Social Survey (GSS). Unlike all previous studies, they used a two-step method. In the first step, individual happiness is regressed on socio-economic and demographic characteristics to measure the average national happiness. In the second step, using the intercept value from the first regression, they regress the average happiness on the national economic indicators to capture the role of the economy on happiness.

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[8] The Reference group is defined as the individuals who live in the same region (i.e., the East or West) having the same age and educational standard (Ferrer-i-Carbonell 2005:1015).

Along with income, other material factors, e.g., wealth and consumption effect on happiness, have also been examined by Headey, Muffels and Wooden (2004). They used the data from the national household panels from five countries, namely Australia, Britain, Germany, Hungary, and the Netherlands. The result from the fixed-effect model indicated that changes in income, wealth and consumption significantly affect changes in happiness level. Although the marginal effects from the three variables are not large enough, the effect of wealth on happiness is stronger than income.

Although in recent years much research has been done on happiness by economists, they were mostly skeptical about the use of subjective measures for the reason of ordinality, scaling, and omitted dispositions (Seghieri *et al.* 2006). The problem of ordinality and scaling is related to the issue that individuals may use different mental scales to reflect their level of happiness. As such, it is difficult to compare among levels of happiness of individuals properly. Omitted disposition is a problem that relates to the unreliability of each individual's expression of their feelings of happiness, due to innate personalities (or predispositions) and native cultures (Cantril 1965). These dispositions may play a vital role in each individual's state of minds which makes a difference in the response of how they feel and the way they reveal their feelings. For example, pessimistic persons can express them as a less happy people than an optimistic one due to the way they view their life even if objective situations are the same for both of them.

Therefore, some sort of individual heterogeneity may correlate with the observed variables, which can create bias in the results of any analysis. It is difficult to get any data set that eliminates the problem of individual heterogeneity or at least minimises the problem like Danish twins used by Kohler *et al.* (2005).[9] But in all other cases, the common approach to overcome these kinds of heterogeneity problems is to consider happiness as an ordinal variable and use longitudinal data to control for unobserved individual heterogeneity (Seghieri *et al.* 2006).

2.3 Happiness Research in Bangladesh

There has been a limited number of research on the individual experience of happiness using representative data in Bangladesh. Existing research concentrated on different groups of people: Mahbub and Roy (1997) used the data from a village in Matlab thana,[10] with a sample of 50 respondents (25 males and 25 females); Mahmuda

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[9] Kohler *et al.* (2005) use data of monozygotic (i.e., identical) twins from Denmark to identify the contribution of partnership and fertility to happiness. They are confident about controlling for the unobserved effect of 'preferences and capabilities due to genetic dispositions, family background and neighbourhood which that affect marriage and fertility behaviour and happiness as the characteristics are common for both twins where they grew up.

[10] *Matlab* is *in* Chandpur District of Chattogram Division (one of the highest administrative units) in Bangladesh.

(2003) used the data of only residents of Dhaka, the country's capital city, and Asadullah and Chaudhury (2012) used the data of 12 districts from six divisions limiting their analysis to rural areas.

Mahmuda (2003) studied the effect of three indicators, such as economic solvency, education, and health, on happiness. Her study also confirmed that social class and gender differences influence the experience of individual happiness in the capital city, Dhaka. She also concluded that poor people identify happiness through basic needs like food, subsistence income and housing, while non-poor identify personal security, savings, peace of mind, and social status as their source of happiness.

Asadullah and Chaudhury (2012) estimated a happiness function using data from a multi-purpose household survey by the World Bank. Using an ordered probit specification with the individual (i.e., age, gender, education, marital status, etc.), household (i.e., wealth) and village controls, they found a significant role of relative wealth and relative income in shaping individuals' happiness. Acknowledging the role of absolute income for the poor, they say that relative income also played a crucial role. Wealthier people in the same village show a higher level of happiness than those having less wealth.

Mahbub and Roy (1997) aimed to identify some indicators that reveal individual happiness through a participatory rapid appraisal approach. Respondents mentioned 'money, fixed income, three meals a day, children and their education, small family, health, access to medical service and peaceful life as essential indicators of happiness', although gender difference is prominent in the perception of happiness, they reported (ibid: 7). Therefore, the indicators that researchers commonly highlight are social class and gender, along with income and an individual's relative position, although income matters more for poor people is well-established.

This study uses a nationally representative sample randomly drawn from six divisions (highest administrative units) of Bangladesh. As highlighted by the review, happiness is examined as a function of income, social class and relative positions to see how much they matter for shaping an individual's happiness.

Whereas previous work conducted in Bangladesh using only cross-sectional data, this study focuses on how happiness has varied across time within a single country using pseudo-panel data. Nonetheless, as discussed earlier, one of the problems related to happiness research is the omitted inherent longitutions that are constant over time. The influence of those factors is controlled for in the econometric model by observing different cohorts and using appropriate techniques to control cohorts' specific fixed effect that is not constant over time. It will provide a better insight into the relationship between the independent variables and happiness.

CHAPTER 3

METHODOLOGICAL FRAMEWORK

This chapter explains the methodological framework used to examine the correlates of happiness. At first, individual cross-section data is used to identify whether there is any link between the difference in income and other traits and happiness. Later pseudo-panel analysis is introduced to capture changes over time in happiness.

3.1 Specification for Cross Section

The dependent variable in the model is 'feelings of happiness', which takes multiple qualitative values with ordinal or ranked outcomes. It would be more appropriate to use ordered response models (i.e., ordered probit or logit) for analyzing this kind of data. Greene (2003) explains this discrete choice framework as follows:

$Probability\ (an\ event\ j\ occurs) = Prob(Y = j)\ F[relevant\ Effects, Parameters]$

where F = Cumulative distribution function for the variable of interest.

In the model, happiness (HP^*) is the variable of interest; it is needed to understand what is the probability that a given value of independent variables allows an individual more likely to report a specific level of happiness. But, the outcome, while is observed is the reflection of an unobserved variable which is called 'latent variable'[11], HP^*. HP* is unobserved, but it can be thought of as an outcome of an observed phenomenon. Now, assuming the error (ε) follows a certain symmetric distribution with zero mean and constant variance as the normal distribution, the underlying latent regression model can be constructed using an ordered probit specification as:

$$HP^* = \beta Y' + \gamma C' + \varepsilon \qquad (1)$$

where, HP^*= Exact measure of happiness, which is unobserved, Y'= Vector of individual level variables, C'= Vector of social and cultural variables, β, γ = Vectors of estimated parameters, ε = Error term

In equation (1), instead of observing HP*, HP is observed for happiness which is the realisation of HP^* in the form:

$$HP = \begin{cases} 1 & if\ HP^* \leq 0 \\ 2 & if\ 0 < HP^* \leq \mu_1 \\ 3 & if\ \mu_1 < HP^* \leq \mu_2 \\ 4 & if\ \mu_3 < HP^* \end{cases}$$

where, μ_i = for i= 1, 2, 3 are unknown parameters to be estimated as cut-off points.

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[11] Latent variables are those variables that cannot be observed directly but be inferred based on observed characteristics. In our model, happiness is the latent variable, which is unobserved. However, we can observe it through the number an individual assigns to express his/her level of happiness.

For estimating equation (1), it is needed to estimate the coefficients ($\beta's$) and the cut-off points (μ_i) along with the other vector of parameters. Note that the estimated cut-off points in the above four choices of happiness level need not be equal as seen in the OLS model. The observed variable (i.e., happiness) works as a form of censoring in this model (Greene 2003). The respondents have their own measure of feelings, which depends on certain measurable observed factors (Y') and certain unobservable factors(ε) (Greene 2003). Hence, each respondent responds to the question based on his own measure of HP^*. Given the four choices in the happiness questionnaire, the respondent would choose the cell that most closely reveals his own feelings (Figure. 3.1).

Figure 3.1: Probabilities in Ordered Probit Model
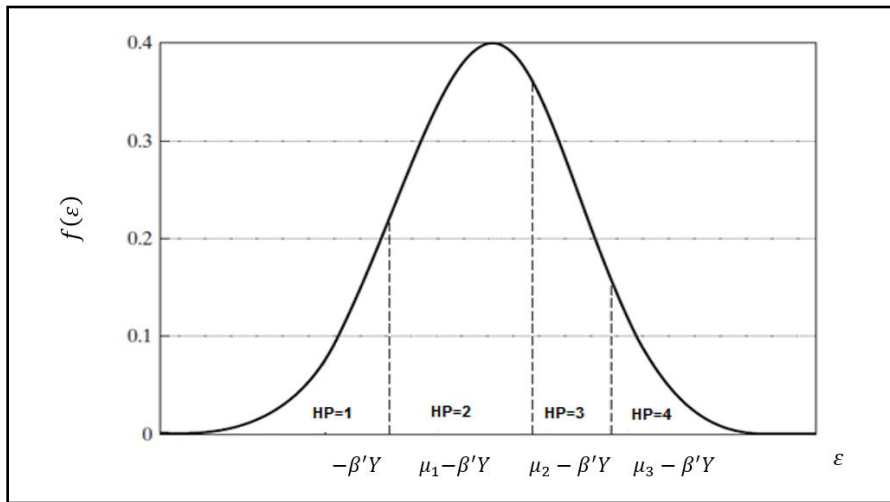
In order to estimate the probabilities from an ordered probit model, the cut-off points, parameters, and values of the independent variables are assumed, which follow a standard normal distribution. So, the probabilities of reporting a specific value of happiness for a given value of dependent variables can be defined as:

$Prob\ (HP = 1|Y) = \phi\ (-Y'\beta)$

$Prob\ (HP = 2|Y) = \phi\ (\mu_1 - Y'\beta) - \phi\ (-Y'\beta)$

$Prob\ (HP = 3|Y) = \phi\ (\mu_2 - Y'\beta) - \phi\ (\mu_1 - Y'\beta)$

$Prob\ (HP = 4|Y) = 1 - \phi\ (\mu_3 - Y'\beta)$

Here, ϕ = standard normal distribution function and all probabilities sum to one.

For the ordered probit model, marginal effects cannot be explained from the estimated coefficients directly because they are not uniquely defined as ordinary least squares (OLS) estimates. Therefore, the values of the independent variables are used to calculate the marginal effects as described below:

$$\frac{\delta\, Prob\ (HP\ =\ 1|Y)}{\delta Y}\ =\ \phi\ (-Y'\beta)\beta$$

$$\frac{\delta\, Prob\ (HP\ =\ 2|Y)}{\delta Y}\ =\ [\phi\ (\mu_1 - Y'\beta) - \phi\ (-Y'\beta)]\beta$$

$$\frac{\delta\, Prob\ (HP\ =\ 3|Y)}{\delta Y}\ =\ [\phi\ (\mu_2 - Y'\beta) - \phi\ (\mu_1 - Y'\beta)]\beta$$

$$\frac{\delta\, Prob\ (HP\ =\ 4|Y)}{\delta Y}\ =\ \phi\ (\mu_3 - Y'\beta)\ \beta$$

Here, ϕ is defined as the standard normal distribution density function.

The coefficients from the above equations would give the direction and magnitude of marginal effects for each happiness category. Because the underlying assumption of probability is that it must add up to one, the marginal effects derived from probabilities should also add up to zero.

Two different kinds of variables are incorporated in equation (1), i.e., dummy and continuous. For continuous variables, marginal effects are calculated by a small change in the dependent variable due to a small change in the independent variable, which can cause the distribution function to shift. On the other hand, for dummy variables, marginal effects are approximated by taking the difference in the predicted probability of reporting a specific level of happiness for the two groups (Liao 1994). The marginal effects are the most important part of the analysis as it explains whether changes in key explanatory variables increases the probability of reporting different level of happiness. Therefore, it allows determining which factors need to be given more emphasis to improve the overall level of happiness among Bangladeshis.

3.2 Specification for Pseudo-panel

The model analysed so far will identify the correlates of happiness from a cross-section of two years. However, it would be interesting to know how much of this cross-section variation in income and other traits contributed to changes in happiness over time. For doing this kind of exercise, this study feels the need for a panel data set. The data set that will be used comes through the survey of a different individual in each survey year in Bangladesh. So, the opportunity to observe the same individuals over time has been missed. But still, the possibility remains to observe groups of individuals from one survey year to another. The Pseudo-panel method provides an alternative to using panel data for estimating fixed effects models when only independent repeated cross-sectional data are available. They are widely used to estimate price or income elasticities and carry out life-cycle analyses, for which long-term data are required, but panel data have limits in terms of availability over time and attrition (Guillerm 2017). Hence, a pseudo-Panel data set has been constructed by tracking groups of individuals

called cohorts[12] from repeated cross-sectional surveys to build a substitute data set for the true panel data set.

The benefit of using cohort data over cross-section is twofold. First, it tells us about the average happiness for various cohorts over time and secondly, how happiness changes over time within the cohort. Apart from these, using cohort data makes it possible to control the unobservable fixed effects like true panel data set (Deaton 1997). Therefore, equation (1) is unified with fixed effect at the level of the individual in the form as follows:

$$HP_{it} = \alpha + \beta Y_{it} + \gamma_{it} C + \mu_t + \theta_i + \varepsilon_{it} \tag{2}$$

where, μ_t are year dummies and θ_i are individual fixed effects.

For generating cohorts to estimate equation (2), this study pools the cross-section data from two years. While pooling the comparability of each variable has been ensured by checking whether responses came from similar questions in each year in a similar manner.

The cohort is defined using age, gender and education level that is time-invariant. The age cohort is formed based on the year of birth of an individual. As people born in the same cohort grow up with the same culture, technology and socio-economic circumstances, tracking them over time will end up with a true picture of the whole population. At the same time, combining gender and educational attainment of the individual with age allows us to restrict individual movement within the cohort in a pseudo-panel. Hence, this study ends up with 24 cohorts combining three fixed characteristics i.e., age, gender and education level (see Appendix Table: C.1).

After generating the cohorts, the variables are formatted to construct the pseudo-panel. The formation is done based on the type of the variable used to represent a given characteristic. For continuous variables (e.g., age, number of children etc.), the mean for each individual in each cell (cohort) is considered. While the proportion is taken (a value equal to the proportion of individuals in the cohort with that characteristic) for those variables that indicate the presence or absence of specific characteristics in each person. As cohorts are not uniform regarding some characteristics such as marital status, social class, relative position, etc., taking proportion exhibits that non-uniformity among the cohorts (Russell and Fraas 2005). In the case of ordered variables such as happiness and freedom of choice, at first, a dichotomous dependent variable is generated by collapsing the orders,[13] and then the proportion of that variable

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[12] A cohort is a 'group with fixed membership, individual of which can be identified as they show up in the surveys' (Deaton 1985: 109). The most commonly used cohorts are birth cohorts, birth-gender cohorts, birth- education cohorts, etc.

[13] For making happiness proportional, this study generates the dichotomous dependent variable by collapsing the dependent variable into happy and unhappy. The generated variable is coded as 1 if the original variable is *quite happy* and *very happy* (coded as 3 or 4) and 0 otherwise (*not at all happy* and

is taken in a cohort. Dummy variables are generated only for the three characteristics i.e., age, gender and education status, as for these characteristics, a certain cell possesses everyone in the cell holds that characteristic or not.

In the final stage, this study takes an average of all individuals belonging to each cohort in each year. This procedure produces 24 cells representing 24 cohorts. The cohorts of 24 repeated over two years give us 48 cells (24*2=48) of cohort mean data (the details about the construction of pseudo-panel are discussed in Appendix C). In such a way, the pseudo data set is prepared for the estimation of equation (2).

After taking the average of all individuals belonging to each cohort, individual fixed effect in equation (2) is replaced by cohort fixed effects. When averages are taken to form the pseudo-panel, the resulting fixed effect (θ_i) is the average fixed effects of individuals from both years. Hence, the individual fixed effects are no longer fixed in equation (2). So, the cohort version of equation (2) can be reformulated as:

$$\overline{HP}_{ct} = \alpha + \beta \overline{Y}_{ct} + \bar{\gamma}_{it} C + \mu_t + \bar{\theta}_c + \bar{\varepsilon}_{ct} \tag{3}$$

Where, c is the individual mean in each cohort at time period t and $\bar{\theta}_c$ are the cohort fixed effects.

Equation (3) becomes the most important equation for our analysis as it captures the cohort effects on happiness over time. It detects the effect of changes in income and other traits on changes in happiness level, which is the novelty of pseudo-panel analysis.

Note that, if cohort-specific fixed effects are uncorrelated with the error term, the random effect model would give us a more efficient and consistent estimate of the parameters in equation (3). But if it is not, then the fixed effect model would be the better predictor of equation (3). However, the result from the Hausman test (p>chi=0.00, implies that the hypothesis of non-systematic difference between the coefficients of the two models is rejected; Appendix D explains briefly about these results) suggests that cohort-specific fixed characteristics (e.g., gender, age, education) are sufficiently different among 24 cohorts. As a result, after controlling for all fixed characteristics, the fixed effect model gives us a significant improved fit of the regression results. Hence, to accommodate the cohort-specific fixed effects, fixed effect estimation technique is used to estimate equation (3).

Although fixed effect estimation will control for the cohort-specific fixed effect in the model, some problems remain due to errors-in-variables in equation (3). The error occurs during the replacement of cohort mean which is observed instead of an

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not very happy). Then the proportion of people who are 'happy' in each cohort is counted. On the other hand, for the variable freedom of choice, a dichotomous variable is made by collapsing the order above 5 into one (enjoying freedom) and below 5 into zero (no freedom) and then making a proportional variable from it.

unobservable change in true population cohort means. This replacement inflates the variances and covariances of the sample cohort means by the variances and covariances of the sampling errors (Deaton 1997:105). To overcome this problem of errors-in-measurement, this study uses bootstrapped standard errors with fixed effect estimation technique as suggested by Deaton (1997). This combination can minimise the errors from inflated variances, and covariances of the sample cohort mean together with controlling cohort fixed effect (ibid: 105). Therefore, this consistent estimator is obtained from equation (3).

3.3 Key Variables for the Models

The variables set up for the model are based on the idea that happiness is affected not only by income but also by the individual (i.e., health status, employment condition, age, gender, education, etc.), societal (i.e., social class) and cultural factors (freedom of choice). Hence, instead of relying on one dimension, this study encompasses broader dimensions (i.e., individual level, societal, and cultural factors) that cover several aspects of human life. The aim is to estimate the influences of each variable on happiness. In addition, a set of district-level dummies are included to control for area-specific unobserved fixed effects influencing the outcome variables (Wooldridge 2009).

For selecting the variables, this study mostly relies on past literature to find out the potential determinants of individual happiness. At the same time, a set of country-specific contexts (i.e., religion, freedom of choice) are also incorporated, which can potentially weaken the happiness-income relationship (Easterlin 1974). The detailed list of the selected variables is given in Appendix Table E.1.

Income class is the major variable of interest in our model. Higher income expands individuals' opportunity to buy goods and services and thereby, ensures better living conditions through the fulfilment of basic necessities. Hence, once income starts increasing, anybody could expect the level of happiness level to increase simultaneously. Thus, a positive effect of income on happiness is expected in a society like Bangladesh, where basic necessities are not met for a majority of the population. But once basic needs are fulfilled, income plays little or no role in determining the happiness of an individual (Wolbring *et al.* 2013). In such a case, changes in happiness may not be proportional to the changes in income. Therefore, this study assumes the possibility of decreasing the marginal effect of income on happiness.

In addition to income, it is useful to control for individual wealth. Although the data set used here lacks precise wealth information, social classes[14] are included as the best available proxy. Class stratification mostly depends on economic differences

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[14] Bangladeshi society is divided into three broad classes namely: upper class, middle class, and working class or lower class.

among groups reflected by the difference in income and wealth, possession of material goods, profession and life chances. One of the indicators of wealth is land and among the social classes, the upper class holds the maximum amount of land, in the country (Siddiqui *et al.* 1990)[15]. Therefore, a positive correlation between an individual being in a high social class and his level of happiness is expected.

Considering the definition of how social classes are formed, the possibility that income classes and social classes are correlated must be considered. But the extent of correlation depends on whether a family acquired or inherited wealth and has multiple earning members. Social class will be higher than individual income class if a family owns inherited assets and if there is more than one income-earning member in a family. It is also quite possible that these two variables have no correlation due to the expenditure structure of the family. If high-income households also have high expenditures, then the net income may lower the household's overall wealth status. Nevertheless, this study tests for the existence of multicollinearity among all selected variables and finds no evidence of multicollinearity among income classes and social classes. The Variance Inflation Factor (VIF) is less than 10 for these all, hence both income and social classes are included as explanatory variables in the econometric model (details about the test are in Appendix F).

Individuals are embedded into a social environment and hence can be expected to value their relative social position in society (Podolny 2005). If individuals are unhappy with their well-being as compared to their peers, it naturally affects their state of happiness. Hence, happiness is assumed to be influenced by the relative position of an individual. This study captures this dimension through two variables, i.e., relative income position and relative social position[16]. It is generally accepted that people who perceive their household socio-economic condition much higher compared to others in the community are more likely to report themselves as happier than others. So, it can be expected that both the coefficients from relative income position or relative social position to be positive if individual position is above the average position of that locality.

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[15] Siddeki *et al.* (1990) find the upper class (i.e., upper and upper- middle class) constitutes 30 per cent of the total population and owns around 80 per cent of the total land of Dhaka city, while the middle class (i.e., middle and lower middle class) are formed of 30 per cent the population and own 20 per cent of land and the working class (40 per cent of the population) does not hold any land asset.

[16] Relative income position is created by considering individual income class with average income class in the locality (the district where individual's household is located). It is a dummy that has a value of one if the individual's income class is higher than the local average, and zero if it's lower. On the other hand, the relative social position comes from comparing individual social class with average social class in the locality. It is also a dummy representing individual social position below or above the average social position in the locality.

Among the individual characteristics, age is included to examine changes in happiness with age. Some authors argue that early age is the best period for survival; as age increases, people gain or lose several things that can affect happiness level (Harris 1975). Others argue that, in the life cycle of an individual, happiness level fluctuates over time. There are some times when happiness level is high and some other times, it is low. Hence, there is a possibility of a U-shaped relationship between age and happiness (Blanchflower and Oswald 2000). To test this U-shaped relationship, age squared is included as an explanatory variable.

The variable religion is also included in the model to see whether belonging to a particular religion yields a higher level of happiness after controlling for other characteristics. Bangladesh is considered a conservative country, with a strong sense of attachment to traditional culture and customs, familial and religious values. The majority of the population is Muslim, and this gives minorities a sense of exclusion and deprivation (Inglehart and Klingemann 2000). So, it is important to detect whether minorities describe themselves as unhappy or dissatisfied with their life in a country that is considered as one of the happiest in the world.

Health is one of the core determinants of happiness that encourages individuals to participate in different kinds of life activities (Doyal and Gough 1991). Good health enables individuals to work hard and assure themselves of better income and living conditions. Research shows that very few households in Bangladesh report facing no health-related problems. If any household member falls sick, the out-of-pocket expenditure constitutes a big expenditure for that household. In the rural areas, on average 18 per cent of total household income was spent on health-related expenditures such as medicine, doctor's fee, travel expenses, accommodation in hospitals, etc. (Davis 2005). Thus, a positive relationship between health status and happiness is expected.

The number of children in a family is another variable that can play a crucial role in shaping an individual's happiness. With a strong belief in familial values, people seek happiness in building a family, especially as a higher number of children, particularly boys, are seen as old age security (Camfield *et al.* 2006[17], Mahbub and Roy 1997). Though children in a family matter for happiness, the big family size is also a concern for happiness. Hence, a positive relationship between the number of children and happiness up to a certain number of children is expected in this study.

Gender, marital status and education level of the individual are added as control variables in our model. Gender is the most important variable in the sense that it will

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[17] Children are one of the major sources of happiness. Good parenthood is viewed as a significant accomplishment in Bangladeshi society. It is a matter of reputation for parents when their children have good upbringing in life. At the same time, they feel proud when their children are doing better than other children in the locality or neighborhood (Camfield *et. al.* 2006).

reveal whether women are experiencing a higher or lower level of happiness than men. It will capture the typical characteristics of patriarchic society where females are disadvantaged, discriminated and subject to violence within the household, society or even in the workplace (Farouk 2005).

Education is another important variable that may directly affect an individual's level of happiness. The evidence says that the possibility remains for getting either positive or negative effect a from education on happiness. Education would generate a positive effect when individual can achieve his/her desired goal through education or education helps the individuals to adapt to the changes around them (Tenaglia 2007). The negative effects would come through the rise in the level of expectations together with fulfillment of desired goal (Clark and Oswald 1994). Hence, this study expects either positive or negative effects from education on happiness.

Marital status is included to capture the effect of interpersonal relationships between men and women on happiness. Interpersonal relationships are extremely important for leading a happy life (Tenaglia 2007), where a stable and enduring relationship is one of the expectations. Thereby, married women and men may be happier than unmarried individuals if their relationship is stable and supportive. If marital respondents report a higher level of happiness than unmarried ones (Denier *et al.* 2000), it can be expected that a positive correlation between happiness and marital status exists. In Bangladesh, marital status can be a potential variable for influencing individual happiness levels, especially for women. Widowed women are often among the vulnerable groups in society. Thus, the presence of a husband can be an indicator of better living (Mahbub and Roy 1997).

According to Sen (1993), happiness not only depends on material goods or possessions but also on notable rights and positive freedoms, which are generally ignored from the happiness equation. Therefore, this study includes the freedom of choice variable in our model, which is an ordinal variable rate on a scale of 10^{18}. The underlying idea is that if people are free to make their own choice without any obligation and are capable of making their own decisions, they are likely to feel happy (Veenhoven 2000). Hence, this study expects a positive relationship between happiness and the variable freedom of choice.

Individual employment status is another key variable to consider. Research shows that unemployment is one of the major sources of individual stress (De Tella *et al.* 2001). But some people may voluntarily agree to become unemployed because of the

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[18] Freedom of choice is rated on a scale of 10, where 1 means 'no freedom' and 10 means 'a great deal of freedom'. This variable came through asking the question 'How much freedom of choice and control individual has while making decisions?'. It is true that some people may feel completely free to choose and have proper control over their lives while taking decision, depending on the extent individual will rank his position over a scale 0 to 10.

unattractive salary structure compared to a sound social security system. Hence, it is possible that unemployment does not include stress among all unemployed people. In Bangladesh, as there is no provision of social security system for unemployed people, a negative effect of unemployment on the individual level of happiness is expected.

Savings is another variable that reflects the future sense of security of an individual and is worth considering in our model. The data used in this study does not have sufficient information regarding individuals' or households' savings. The information, which was collected is that 'whether a particular family had saved during the past year or not'. It is a dichotomous variable of one if a household saved during the last year and zero otherwise. This study uses this variable to see the difference in happiness level between a household that saved during the last year, and that does not. Therefore, it is expected if an individual has saved enough in the last year, he will feel secure and happy.

The following chapter will provide the preliminary analysis of the data.

CHAPTER 4

THE DATA AND ITS EXPLORATION

This chapter presents a preliminary analysis of the data used for the analysis. An exploration of the data is made to see changes, over the years, in happiness and other different traits. At the same time, a brief discussion is presented on the source, sample selection process, and measurement issues related to data.

4.1 Sources of Data

This study uses secondary data from the World Value Surveys (WVS)[19]. For Bangladesh, only two waves of data sets are available. Although the dataset is old, it is the most comprehensive data set available so far for Bangladesh with a range of information on household's socio-economic information, demographic characteristics, individual's perception about life and political view, religious orientation, and his/her level of happiness, etc., which will give us an indication of the association between happiness and income in the era of rising per-capita income in Bangladesh. The first wave (1994-1999) was collected in 1996 and the second wave (1999-2004) was in 2002 with a sample size of 3025 (wave one= 1500; wave two=1525). The data was individually self-reported and subjective that came through the process of a stratified multistage random sampling of representative national samples. Samples were drawn from the entire population of 18 years and older, with only one individual selected from each household.

The level of happiness of an individual is the variable in concern, which came through the answer of the question: 'All things considered, how happy are you with your life?', with 4 response categories from 'very happy' to 'not happy at all'.[20] The formation collected in the first wave remains the same in the second wave of the WVS. So, it is easy to compare the response from the question over time. The wording of the question makes it very similar to the question asked in the General Social Survey (GSS)[21]. This type of questionnaire captures both the feeling of happiness along with its intensity and forced an individual to judge his overall quality of life (Kahneman and Krueger 2006). Hence, from the same happiness question, it is possible to get an overview of an individual's state of happiness and information about his/her overall quality of life.

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[19] 'The World Value Surveys grew out of a study launched by the European Values Survey group (EVS) under the leadership of Jan Kerkhofs and Ruud de Moor' (Inglehart *et al.* 2004).

[20] Exact categories are ordered as: 1=not at all happy, 2=not very happy, 3=quite happy and 4=very happy.

[21] In GSS, the question that is asked about happiness is "Taken all together, how would you say things are these days-would you say that you are very happy, pretty happy, or not too happy?''

4.2 Sample Selection Criteria

The administrative structure of Bangladesh is divided into six divisions (Map 4.1). Each division divides into districts, each district into upazila, each upazila into unions and each union into wards/villages.

Map 4.1: Map of Bangladesh with Sampled Divisions and Districts

Source: Adapted from http://www.mapsofworld.com/bangladesh/bangladesh- political-map.html, Accessed 3 November 2013.

The sample was predetermined and distributed between urban and rural areas on the basis of their population. The distribution of the sample is 64 per cent and 36 per cent for rural and urban, respectively. For rural, the sample is distributed among 60 districts (4 excluded for inaccessibility). One Upazila was chosen from each district randomly. Then two unions from each Upazila and two villages from each Union. The respondents were then randomly picked from those villages among the voting age men and women. For urban areas, the sample was distributed to various urban areas

according to population, and then the respondents were randomly selected from there. The distribution of gender is 45 and 55 per cent for females and males, respectively.

Thus, a total of 1,525 and 1,500 individuals were selected from 66 sample villages in 1996 and 2002, respectively. The number of sample districts, upazilas, and unions is shown in Table 4.1.

Table 4.1: Distribution of Sample by Division

Divisions	Districts	Upazila	Unions	Villages	No. of Respondents	
					1996	2002
Dhaka	6	6	12	24	466	564
Chittagong	5	5	10	2	439	368
Khulna	2	2	4	8	155	63
Barisal	1	1	2	4	78	105
Sylhet	2	2	4	8	156	130
Rajshahi	5	5	10	20	231	270
Total	21	21	42	66	1525	1500

Source: Author's computation based on WVS data of 1996 and 2002 from Bangladesh.

4.3 Measurement Issues Related to Data

In the WVS, income measure is administered in the form that survey's respondents are provided with a show card of ten income brackets, each labelled with a letter.[22] Individuals are then asked which group their income falls, counting all wages, pensions and other incomes before taxes and other deductions.

The brackets are defined by the country's principal investigators and are intended to represent the deciles of the income distribution. This approach was followed, and the values of the bracket cut points are available for 152 of the 245 country waves included in the WVS (Donnelly and Pol-Eleches 2012).[23] Another 58 country waves were asked in this manner but not accompanied by documentation of the bracket values. The same story prevails for Bangladesh. The income brackets are not documented in the main data set. The information about the income brackets is collected from the Institute of Bangladesh Unnayan Parishad (BUP)[24] that did the fieldwork for the World Value Survey. The collected income brackets are used for our analysis.

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[22] The letters are not in alphabetical order, allowing respondents to feel, at least, some sense of privacy though the enumerators are likely to have seen the cards anyway.

[23] A seminar presentation on 'The Questionable Validity of Income Measures in the World Values Survey' prepared for the Princeton University Political Methodology Seminar, held on March 16, 2012.

[24] The Bangladesh Unnayan Parishad (BUP) is a non-profit organisation devoted to the promotion of basic as well as action research on socio-economic development and the environment. It was established in 1980 and is registered with the Government of Bangladesh under the Societies Act 1860. See details on the website: http://www.bup-bd.org/

4.4 Exploration of Data

This section describes the characteristics of the main variables used in the estimation process and explains how the measure of happiness is related to different aspects of life.

Figure 4.1 confirms that Bangladeshis enjoyed a high level of happiness in 1996 when the majority (around 85 per cent, combining 'quite happy' and 'very happy') of the respondents from the representative sample reported themselves as happy. However, the rate stood at 77 in 2002–a 9 per cent decline recorded in the report of the percentage of happy people across years. A decrease of 'very happy' and 'quite happy' by 17.6 and 6.2 per cent and a simultaneous increase of 'not at all happy' and 'not very happy' by 54.8 and 4.7 percentage points respectively are responsible for this decline (Figure 4.1). Hence, average happiness declined by 3.65 per cent in 2002 compared to 1996 (Appendix Table G.1). Note that these changes may not be statistically different from each other as the proportions are not that different.

Figure 4.1: Happiness Across Different Years in Bangladesh
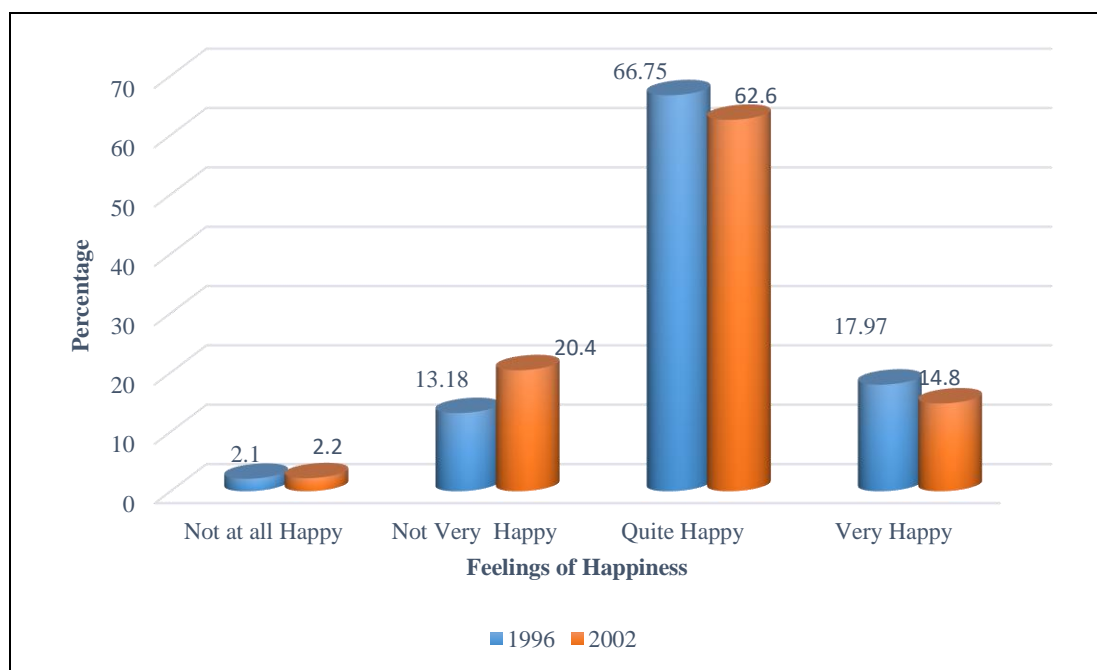
Source: Author's computation based on WVS data of 1996 and 2002 from Bangladesh.

Appendix Table G.1 represents the summary statistics of all the variables used in the estimation process, disaggregated by different time periods. Pearson's correlation coefficients are shown in the last column after each year to show how happiness correlates with socio-economic and demographic variables.

Relatively high positive correlations with happiness are found for high-income classes, upper-class people, relative income and social position, people who save,

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enjoy freedom, and people having education and above secondary but below masters, people having fair and good health status, and marital status as single. On the other hand, a negative association with happiness exists for poor-health persons, uneducated, widows,and working class of society. Interestingly, no religious variable has a statistically significant association with the happiness variable and being a religious denomination Muslims have a negative association although majorities are Muslim. The average level of happiness is 3.01 and 2.9 in 1996 and 2002, respectively on a scale of 4, implying that average happiness is equal to the category of 3, that is, *quite happy*.

Considering the information across years and at the gender disaggregation level, both men and women are experiencing a decline in happiness; men are reporting a higher level of happiness than women (Figure: 4.2). By adding up the percentage of people reporting very happy and quite happy, this study observes that there is a decline of 13.1 per cent (85.1 to 73.9 per cent) in female reporting as happy compared to 4.9 percentage decline (84.4 to 80.2 per cent) that of male.

The typical nature of falling happiness for women is a major cause of concern as Bangladeshi society is a patriarchal society where females turn to be dependent on male. Here women get more respect for their role in the household rather than as a person (Khan 1991), and their role becomes crucial for their marital stability if they work outside the home sphere. They need to balance their roles at home and office. During this balancing, childrearing and upbringing is a major source of anxiety for them due to the absence of child care facilities in the working places and the presence of a reliable and efficient person or domestic maid in the household (Shamsuddin 1990). If the role in the household, together with upbringing the children, collude with their working role outside, it contributes to stress and depression and creates conflict in family life (Khan 1991). Across the time periods, a 65.19 per cent increase in female labour force participation (from 15.8 per cent in 1995-96 to 26.1 per cent in 2002-03)[25] has been recorded nationally. Hence, there is a link between increased female labour force participation and a decline in female happiness across the years.

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[25] Bangladesh Bureau of Statistics (2002) *Report on Labour Force Survey 2002-03*, Ministry of Planning, Dhaka.

Figure 4.2: Distribution of Gender and Happiness across Years
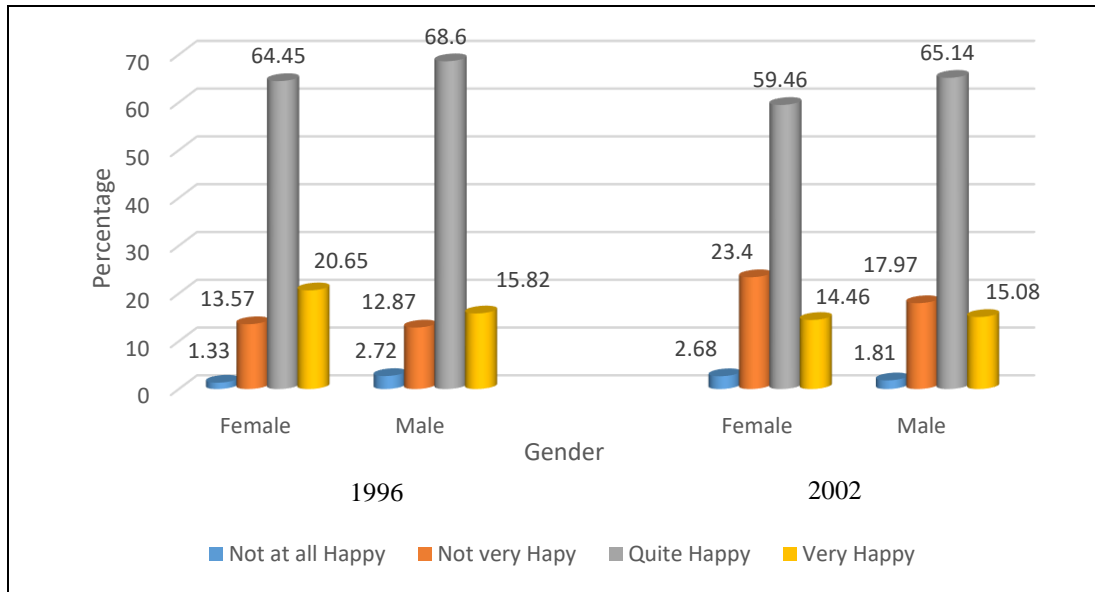
Source: Author's computation based on WVS data of 1996 and 2002 from Bangladesh.

To see how happiness can be linked with the income domain, the distribution of the population by happiness category is plotted (Table 4.2). There is a clear pattern in the percentage distribution of income, once income starts increasing from lowest class to upper class. Comparing both the years, it is observed that when income starts increasing, the percentage of people reporting 'not at all happy' and 'not very happy' start falling gradually, and reaches zero when the highest income class is reached. The only exception is for income class Tk. 50,001 to Tk. 10,000 where the reporting increases. On the other hand, once income starts increasing, people are more likely to report being quite happy and very happy, indicating that income contributes to the reduction in the unhappiness of the people. These give us an impression that happiness relates positively to income at a given point in time as acknowledged by Frey and Stutzer (2000) and Easterlin (2001). Interestingly, although the percentage increases for 'quite happy' and 'very happy', it only increases up to a certain income level then starts falling. In 1996, the highest reporting goes for income class of Tk. 20,001-25,000, while in 2002, it goes for Tk. 15,001 to Tk. 20,000. Hence, some kind of non-linearity pattern is observed in the happiness-income relationship.

Table 4.2: Distribution of Population by Happiness at Different Income Levels

Individual Income (Taka)	Year 1996				
	Not at all Happy	Not Very Happy	Quite Happy	Very Happy	Number
Income Group					
Up to 5,000	25.00	23.38	13.95	8.03	219
5,001-10,000	34.38	15.42	7.76	8.76	145
10,001-15,000	18.75	13.93	17.98	13.14	253
1,5001-20,000	15.65	15.92	16.6	14.96	247
20,001-25,000	3.13	7.46	18.27	16.06	246
25,001-30,000	3.13	6.47	8.15	7.66	118
30,001-35,000	0.00	15.42	10.22	10.22	163
35,001-40,000	0.00	1.00	5.21	14.23	94
40,001-45,000	0.00	1.00	1.57	6.2	35
45001 and above	0.00	0.00	0.29	0.73	5
Year 2002					
Income Group					
Up to 5,000	3.03	6.21	2.98	2.15	53
5,001-10,000	9.09	14.71	6.07	2.25	110
10,001-15,000	36.36	23.86	18.85	9.46	283
15,001-20000	15.15	20.92	21.94	18.92	317
20001-25,000	18.18	20.92	21.19	17.86	302
25,001-30,000	3.03	4.58	11.82	17.12	164
30,001-35,000	12.12	5.23	10.33	16.02	157
35,001-40,000	3.03	2.61	5.32	11.26	84
40,001-45,000	0.00	0.98	0.53	3.6	16
45,001 and above	0.00	0.00	0.96	2.2	14

Note: Table represents column percentage.
Source: Author's computation based on WVS data of 1996 and 2002 from Bangladesh.

To observe the pattern clearly through a simple point of time relationship, this paper added two categories quite happy and very happy. Surprisingly, in year one, once income starts increasing, this study observes upward and downward inconsistent patter of the percentage of people reporting themselves as happy. The reporting reaches highest two times in year one at income class Tk. 10,001-15,000 (34.3 per cent) and Tk. 20,001-25,000 (20.4 per cent). A clearer pattern is observed in year two (2002), where percentage reporting increases once income starts increasing from the lowest class up to income class Tk. 15,001-20,000 (40.9 per cent) and then it starts falling gradually until the last income class is reached. But almost the common pattern of fall in the percentage of people reporting happy is observed after income class Tk. 35,001-40,000 in both years. This tends to support the argument of 'threshold theory,' which claims that once a certain threshold of basic needs has been fulfilled, returns from additional income in terms of improved quality of life start diminishing (Helliwell 2003; Layard 2005). Hence, people are unhappy at both ends of the income class distribution (Figure 4.3).

Figure 4.3: Distribution of People Reporting Happy by Years
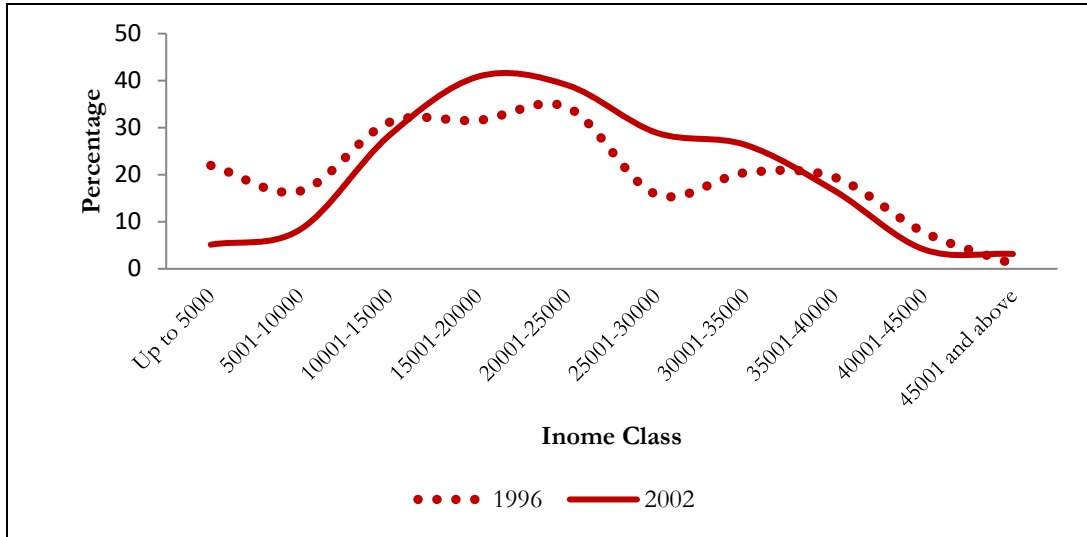
Source: Author's computation based on WVS data of 1996 and 2002 for Bangladesh.
Note: 'Happy' is calculated by collapsing two categories of happiness, i.e., 'very happy' and 'quite happy'.

One of the key differences in the experience of happiness is directly related to people's perceived social classes (Worcester 1998). In both years, the percentage of people belonging to the upper-class reports 'quite happy' and 'very happy' more than other social classes (92.5 and 89.6 per cent in both year, respectively). In addition, people who claim to belong to the middle class report a higher percentage than the working class (87.1 and 79.3 per cent against 70.2 and 62.2 per cent for middle and upper class in 1996 and 2002, respectively).

This study also observes a declining pattern of the percentage of people reporting themselves as happy. Across years, all social classes experience declines in happiness. The percentage decline is highest for the working class (11.35 per cent) compared to middle and upper classes (8.9 and 3.2 per cent) (Table 4.3).

If we look at the macro-economic situation of Bangladesh, especially the inflation scenario of that particular time period (1994 to 2004 as shown in appendix Figure G.1), a rising trend of food and non-food price during 2002 compared to 1996 is noticed. Lower class people usually belong to the occupation categories of a rickshaw puller, servant, driver, fisherman, weavers, etc., who are the first victim of price hike (Shakib 2012[26]). As they have fixed earnings, it would be difficult for them to cope easily with the rising price of food and non-food items. Hence, it can be a cause behind the decline in reported happiness for the lower class.

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[26] Shakib (2012) studied the impact of price hike over lower and middle class. Due to price hike essential daily commodities to transportation, educational, medical and other expenses all are increasing. Around 98 per cent of the lower-class people in Dhaka city and in other parts of the country report difficulty in coping with the situation.

Table 4.3: Distribution of Population by Happiness and Social Class

Social Class	Not at all happy	Not Very Happy	Quite Happy	Very Happy
1996				
Working Class	4.68	25.15	63.74	6.43
Middle Class	1.79	11.14	70.29	16.77
Upper Class	0.50	6.97	62.44	30.10
2002				
Working Class	5.02	32.78	56.46	5.74
Middle Class	1.05	19.61	66.47	12.87
Upper Class	1.21	9.18	62.56	27.05

Note: Table represents row percentage.
Source: Author's Computation based on WVS data of 1996 and 2002 from Bangladesh.

The other important variables are relative positions. Relative social position variable shows that 91.5 per cent of an individual whose social class is above the average social class in the locality report themselves as happy (combining 'quite happy' and 'very happy') while the reporting is 79.6 per cent for people below the average. Across years, it falls to 85.4 and 69.9 per cent for the relative position above and below the average, respectively (Table 4.4).

Table 4.4: Distribution of Population by Happiness and Relative Position

Relative Position	1996			
	Not at all Happy	Not very Happy	Quite Happy	Very Happy
Below	3.46	16.94	67.28	12.33
Above	0.30	8.22	66.06	25.42
2002				
Below	3.24	26.86	59.65	10.26
Above	1.21	13.42	65.91	19.46

Note: Table represents row percentage.
Source: Author's computation based on WVS data of 1996 and 2002.

In the case of relative income position, around 93 per cent of the surveyed individuals report themselves as happy in 1996 if their income position is higher than the average income position of the locality. It falls to around 84 per cent in 2002 for the people whose income position is above the average income position (Table 4.5).

Table 4.5: Distribution of Population by Happiness and Relative Income Position

Relative Income Position	1996			
	Not at all Happy	Not very Happy	Quite Happy	Very Happy
Below average income	3.31	18.44	65.84	12.41
Above average income	0.59	6.63	67.89	24.89
	2002			
Below average income	2.84	25.71	60.94	1.51
Above average income	1.45	14.18	64.54	19.83

Note: Table represents row percentage.
Source: Author's computation based on WVS data of 1996 and 2002 from Bangladesh.

Average happiness as a function of age exhibits the U-shape pattern found in many previous studies (Frijters and Beatton 2008[27], Blanchard and Oswald 2002). The pattern is not much clear in 1996. However, it is clear in 2002, when this study observes a U- shape relationship between average happiness and age group (Figure 4.4). The fall in average happiness level up to age group 35 to 44 is similar in both years. After crossing age 35 to 44, different trends are visible once age starts increasing. Mean happiness falls drastically in year one, while it starts increasing gradually in year two after crossing the age group 55-64.

Figure 4.4: Mean Happiness by Age Group
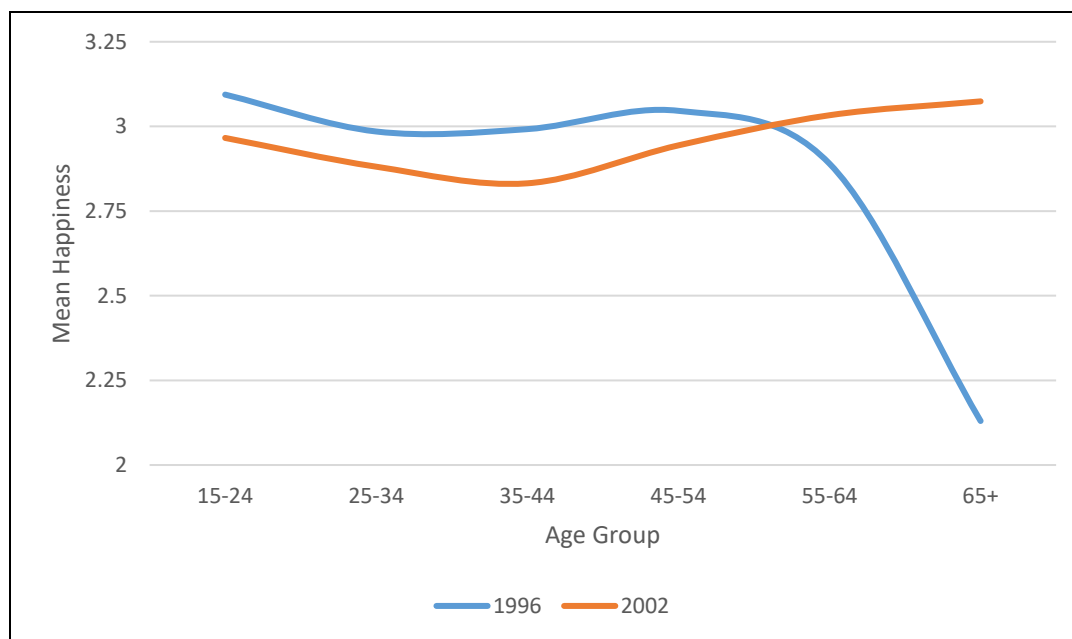
Source: Author's computation based on WVS data of 1996 and 2002 from Bangladesh.

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[27] Summarised in: Frijters, P., and T. Beatton. 2008. "The Mystery of the U-shaped Relationship between Happiness and Age." National Centre for Econometric Research Working Paper Series No. 26.

The age for retirement[28] belongs to this age group when people need social security from the state. In Bangladesh, there is no provision of social security system like the case in many developing countries in the world. But due to large population size, resource scarcity, poverty, poor public healthcare services and absence of social security ageing have become a social concern in Bangladesh. Although the public servant's retirement act of 1974[29] allows a pension system for the government and semi-government officials, still a vast number of aged people engaged in non-public sectors like agriculture, industry and services (private), which are not under the coverage of this pension system. As a result, the sudden change in occupation status can be a crucial factor behind the tremendous fall in happiness after this age has been crossed. But in year two, this does not happen. The literature says, by the middle of age most people release the lifelong aspiration and thereby start enjoying their life more than earlier time (Blanchard and Oswald 2002). Since most workers retired in their early sixties in Bangladesh, this study inspects the age-happiness pattern and finds that the increase in life and leisure satisfaction is well visible in the first part of the 60s in year two. In 1998, the government introduced an Old Age Allowance Programme (OAA)[30] to cover the majority of people who worked for the non-public sector. It can be possible that the programme does have an impact on the respondents above the age group 55-64[31] in year two when average happiness shows a sharp rising trend after the retirement age has been passed.

Bangladesh is a Muslim majority country. Sometimes religion becomes the issue of internal conflict among different religions if minorities are less happy than the majority (Graham *et al.* 2004). Only a small minority of Hindu and Christian report themselves as unhappy (less than 18 per cent). However, the percentage of happy people remains stable irrespective of any religion (Table 4.6). It explains that religion makes relatively little difference for happiness in Bangladesh.

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[28] According to the Public Servants Retirement Act 1974 and Rules 1975, the retirement age in public service is 57 years, which is extended to 59 years by placing an ordinance of public servants (Retirement) act in 2011. For details see: http://www.rhd.gov.bd/RulesAndRegulations/View_Overview.asp?Ref=A

[29] The act says the pension amount is equal to the last pay drawn by the individual rather than 12 months' average pay. The maximum pension amount is 60 per cent of the last pay (Miyan 2005).

[30] This scheme is implemented first only in the rural areas covering all upazilas and wards of 64 districts with elderly persons incapable of physical work and the destitute women are receiving Tk. 100 per month as an allowance from the government on monthly basis. Now the amount increased to Tk. 150 per month. Although it still fails to cover the whole aged people, the government is trying to increase the budget each and every year to cover as many people as possible. In the years 1997-98, it covered more than four lacs three thousand (exactly 403,110) elderly people, while in 2002-03 around five lacs (exactly equal to 499,662) old aged persons. In 2003-2004 and 2004-05, the coverage increased to one million and over one million and three lac (equal to 13,15,000) old aged persons respectively (Miyan 2005).

[31] BRAC did an impact evaluation in 2008 on old age and widow allowance in Bangladesh. They found that beneficiaries were not only able to contribute economically to their households but also invested the amount for different income-generating activities to become self-reliant. It also strengthens the position of the receiver in his household, especially increasing the bargaining power of the old woman in the household.

Table 4.6: Distribution of Population by Religious Orientation

Objective Condition	Not at all happy	Not Very Happy	Quite Happy	Very Happy
1996				
Muslim	2.14	12.94	66.69	18.22
Hindu	2.05	15.38	66.15	16.41
Christian	0.00	13.33	66.67	20.00
Buddhist	0.00	0.00	66.67	33.33
2002				
Muslim	2.18	20.46	63.28	14.08
Hindu	1.87	20.56	56.07	21.50
Christian	0.00	16.67	50.00	3333
Buddhist	0.00	14.29	57.14	28.57

Note: Row percentage.
Source: Author's computation based on WVS data of 1996 and 2002 from Bangladesh.

Therefore, some common pattern has been observed in the relationship between income, socio-economic variables and happiness across different time periods. However, these are only bivariate relationships. Thus, it would be interesting to see whether the same pattern and relationship holds when the econometric analysis is conducted, controlling for all other variables in the model.

CHAPTER 5

EMPIRICAL RESULTS AND INTERPRETATION

This study runs the econometric model based on full specifications, explained in chapter 4, including individual variables, household and district level controls. Hence, the ordered probit specification used in this chapter contains individual, household and region-specific variables.

As the exact measure of happiness is unobserved from the ordered *probit* estimates, it is difficult to explain which variable affects the latent outcome happiness. Therefore, the effect on the response probability *[*i.e.,$\partial Pr(HP_i = 1; 2; 3; 4)/\partial X_i$ *]* is calculated, which is the probability of reporting specific values of happiness, i.e., the marginal effects.

5.1 Cross-Sectional Analysis

The marginal effects from the ordered probit model are presented in Table 5.1. Columns 1 to 4 and 5 to 8 represent marginal estimates of the probability of an individual *being not at all happy*, *not very happy*, *quite happy* and *very happy* from two different waves (1996 and 2002).

Income Classes

As seen from column (1), after controlling for individual and household characteristics, a higher income significantly increases the probability of *being very happy* and decreases the probability of *not at all happy* and *not very happy*. As compared to the base income category of Tk. 5,000 or lower, graduation from income class of Tk. 30,001 to TK. 35,000 to an upper category significantly reduces the probability of being *not at all happy* and *not very happy* by 2.3 and 7.8 percentage points, respectively, and increasing the probability of being *very happy* by 11.6 percentage points. The marginal effects of income class on the probability of reported happiness become stronger in magnitude once income level starts increasing beyond the threshold of Tk. 30,001 to 35,000. In 2002 (columns 5-8), a similar picture from income variables had observed. However, the significant effect of income on happiness starts from a relatively lower-level income level (Tk. 25,001 to Tk. 30,000) compared to the previous year.

Table 5.1: Marginal Effects on Happiness by Year: Ordered Probit Estimates

Dependent Variable: Taking all things together, would you say you are happy?
[1= Not at all happy; 2= Not very happy; 3= Quite happy; 4= Very happy]

Variables	1996				2002			
	Not at all happy	Not very happy	Quite happy	Very happy	Not at all happy	Not very happy	Quite happy	Very happy
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Income Class (Ref. Tk. Up to 5000)								
Tk. 5001 to 10000	-0.002	-0.008	-0.002	0.013	0.002	0.011	-0.002	-0.011
	(0.006)	(0.021)	(0.005)	(0.031)	(0.007)	(0.037)	(0.008)	(0.036)
Tk. 10 001 to 15000	-0.007	-0.026	-0.005	0.038	-0.008	-0.041	0.009	0.040
	(0.006)	(0.020)	(0.008)	(0.029)	(0.007)	(0.035)	(0.010)	(0.035)
Tk. 15001 to 20000	-0.008	-0.026	-0.005	0.039	-0.013	-0.064*	0.013	0.063*
	(0.008)	(0.025)	(0.007)	(0.035)	(0.008)	(0.038)	(0.013)	(0.037)
Tk. 20 001 to 25 500	-0.012	-0.042	-0.008	0.062	-0.011	-0.055	0.012	0.054
	(0.009)	(0.028)	(0.011)	(0.038)	(0.009)	(0.046)	(0.014)	(0.044)
Tk. 25 001 to 30000	-0.006	-0.020	-0.004	0.029	-0.027**	-0.137**	0.029	0.134***
	(0.010)	(0.035)	(0.007)	(0.050)	(0.012)	(0.053)	(0.025)	(0.052)
Tk. 30001 to 35 000	-0.023**	-0.078**	-0.015	0.116**	-0.018*	-0.092	0.020	0.091*
	(0.012)	(0.035)	(0.021)	(0.049)	(0.012)	(0.056)	(0.019)	(0.054)
Tk. 35 501 to 40 000	-0.038**	-0.132***	-0.025	0.196***	-0.025**	-0.126**	0.027	0.124**
	(0.015)	(0.041)	(0.034)	(0.054)	(0.013)	(0.058)	(0.024)	(0.057)
Tk. 40 001 to 45 000	-0.041**	-0.142***	-0.027	0.211***	-0.044**	-0.221***	0.047	0.218***
	(0.018)	(0.052)	(0.037)	(0.070)	(0.019)	(0.079)	(0.040)	(0.076)
Tk. 45 001 or more	-0.045**	-0.156**	-0.030	0.231**	-0.030*	-0.150**	0.032	0.148**
	(0.023)	(0.073)	(0.043)	(0.106)	(0.016)	(0.072)	(0.030)	(0.069)
Household Characteristics								
Social Class (Ref. working class)								
Middle Class	-0.019***	-0.065***	-0.013	0.0967***	-0.011**	-0.054**	0.012	0.053**
	(0.006)	(0.018)	(0.019)	(0.033)	(0.006)	(0.027)	(0.011)	(0.026)
Upper Class	-0.019**	-0.064**	-0.012	0.096*	-0.014	-0.068	0.015	0.067
	(0.009)	(0.030)	(0.020)	(0.052)	(0.011)	(0.046)	(0.016)	(0.044)
Relative Position								
Social Position (Above=1)	-0.015**	-0.016**	-0.003	0.023**	-0.011**	-0.018*	0.001	0.038**
	0.006	0.009	0.004	0.010	0.006	0.011	0.007	0.017
Income Position (Above=1)	-0.002	-0.0068	-0.001	0.10	0.004	0.021	-0.004	-0.020
	0.005	0.018	0.004	0.027	0.006	0.028	0.007	0.028
No of Children	0.0010	0.003	0.001	-0.005	0.0001	-0.001	0.0001	0.0006
	(0.001)	(0.004)	(0.001)	(0.006)	(0.001)	(0.005)	(0.001)	(0.005)
Saved in Last Year (yes=1)	-0.006*	-0.021*	-0.006	0.032	-0.002	-0.010	0.002	0.010
	(0.004)	(0.013)	(0.008)	(0.020)	(0.003)	(0.016)	(0.004)	(0.016)
Individual Characteristics								
Age	0.0003	0.0009	0.0002	-0.0013	0.001**	0.006**	-0.001	-0.006**
	(0.001)	(0.003)	(0.0006)	(0.004)	(0.0006)	(0.003)	(0.001)	(0.003)
(Age)2	0.000004	-0.00001	-0.000003	0.00002	-0.00002**	-0.00009***	0.00002	0.00008**
	(0.000008)	(0.00003)	(0.000007)	(0.00004)	(0.000007)	(0.00003)	(0.00002)	(0.00003)

Marital Status (Ref. Single)							
Widowed	0.006	0.021	0.004	-0.032	0.004	0.022	-0.005	-0.022
	(0.010)	(0.033)	(0.008)	(0.049)	(0.011)	(0.053)	(0.012)	(0.052)
Separated	-0.011	-0.037	-0.007	0.055	-0.017	-0.083	0.018	0.082
	(0.019)	(0.066)	(0.015)	(0.097)	(0.022)	(0.108)	(0.028)	(0.106)
Divorced	0.029	0.100*	0.019	-0.148*	0.003	0.014	-0.003	-0.014
	(0.018)	(0.059)	(0.029)	(0.089)	(0.016)	(0.081)	(0.018)	(0.080)
Living together as Married	(omitted)	(omitted)	(omitted)	(omitted)	-0.010	-0.049	0.011	0.049
					(0.020)	(0.098)	(0.023)	(0.097)
Married	-0.011**	-0.037**	-0.007	0.054**	-0.0005	-0.003	0.0006	0.003
	(0.005)	(0.017)	(0.010)	(0.025)	(0.004)	(0.021)	(0.005)	(0.021)
Gender (Male=1)	0.009**	0.032***	0.006	-0.048***	-0.003	-0.014	0.003	0.014
	(0.004)	(0.011)	(0.008)	(0.016)	(0.003)	(0.014)	(0.004)	(0.014)
Education Level (Ref. No Education)							
Primary Education	-0.002	-0.008	-0.001	0.011	-0.004	-0.022	0.005	0.022
	(0.005)	(0.019)	(0.004)	(0.028)	(0.005)	(0.024)	(0.006)	(0.024)
Secondary School	-0.009	-0.032	-0.006	0.048	0.002	0.008	-0.002	-0.008
	(0.006)	(0.020)	(0.010)	(0.030)	(0.005)	(0.028)	(0.006)	(0.027)
Higher Secondary School	-0.007	-0.025	-0.005	0.037	0.004	0.019	-0.004	-0.019
	(0.007)	(0.022)	(0.008)	(0.033)	(0.006)	(0.030)	(0.007)	(0.030)
Bachelor /Honors	0.003	0.011	0.002	-0.017	-0.0003	-0.001	0.0003	0.001
	(0.007)	(0.023)	(0.005)	(0.034)	(0.006)	(0.032)	(0.007)	(0.032)
Masters/ Similar	-0.002	-0.007	-0.001	0.011	0.014*	0.070*	-0.015	-0.069*
	(0.008)	(0.027)	(0.006)	(0.041)	(0.008)	(0.039)	(0.013)	(0.039)

Health Status (Ref. Poor)							
Fair	-0.018**	-0.061***	-0.012	0.091***	-0.027***	-0.135***	0.029	0.133***
	(0.007)	(0.020)	(0.016)	(0.030)	(0.010)	(0.038)	(0.023)	(0.040)
Good	-0.036***	-0.123***	-0.024	0.183***	-0.061***	-0.308***	0.066	0.303***
	(0.010)	(0.0245)	(0.032)	(0.032)	(0.016)	(0.041)	(0.049)	(0.046)
Freedom of Choice	-0.002***	-0.008***	-0.002	0.012***	-0.003***	-0.014***	0.003	0.014***
In ten scale	(0.001)	(0.002)	(0.002)	(0.004)	(0.001)	(0.003)	(0.002)	(0.004)
							Religious Denomination (Ref. Muslim)	
Hindu	-0.001	-0.003	-0.0006	0.005	-0.008	-0.0410	0.009	0.040
	0.004	0.014	0.003	0.021	0.006	0.027	0.008	0.027
Christian	-0.025*	-0.085**	-0.016	0.125*	-0.027**	-0.134**	0.029	0.132**
	0.013	0.043	0.024	0.064	0.014	0.060	0.025	0.059
Buddhist	-0.033*	0.115**	-0.022	0.170**	-0.015	-0.073	0.016	0.072
	0.018	0.056	0.032	0.083	0.016	0.075	0.020	0.074
Unemployed (=1)	0.040*	0.100**	-0.036	-0.103***	-0.0004	-0.002	0.0004	0.0012
	(0.023)	(0.040)	(0.040)	(0.030)	(0.005)	(0.024)	(0.005)	(0.024)
Observations			1,484					1,465
Pseudo R-squared			0.1647					0.199
Log likelihood			-1153.94					-1149.6

Note: Robust standard errors in parentheses; District level dummies are included, *** p<0.01, ** p<0.05, * p<0.1
Source: Author's Computation based on WVS data of 1996 and 2002 from Bangladesh.

Hence, evidence suggests that income matters for happiness. But it seems that influencing the level of happiness of an individual income must cross a sufficient threshold. As a result, the probability of those with higher income being happier with their life is high. This evidence contrasts Graham *et al.* (2004), who argue that relative importance of income is higher at a very low-income level where basic needs are unmet, while at a higher level of income, other factors gain relative importance. Similarly, Wolbring *et al.* (2013) show a strong positive effect on happiness below a certain level of income[32], contrary to our results. But this analysis is based on two highly developed countries in the world (e.g., Germany by Wolbring *et al.* 2013 and Russia by Graham *et al.* 2004) with a GDP far greater than Bangladesh. Hence, the conclusion may not apply to the developing country context.

Often, it is believed that the relationship between happiness and income is curvilinear (Veenhoven 1991) i.e., the happiness function follows a concave pattern over income classes. To check for this possibility, this study runs a bivariate cross-sectional ordered probit regression. As the ordered probit model utilised the four scale of happiness question, the marginal probability effects of income were plotted for each level of happiness (Figure 5.1).

The graphs are based on the predictive margins with 95 per cent confidence intervals. In these graphs, no clear patterns of concavity in the happiness-income relationship are observed. However, the effect of income on predicted probabilities of any level of happiness is large for income ranges from Tk. 30,001-35,000 to Tk. 4,50,000, that is, more towards the right tail of the income distribution.

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[32] Wolbring *et al.* (2003) find that income and happiness are strongly correlated at the lower income range and weekly correlated above a certain income range; the certain threshold value is located within the range of € 800 per month disposable income (ibid).

Figure 5.1: Marginal Probability Effects of Income on Happiness in 1996
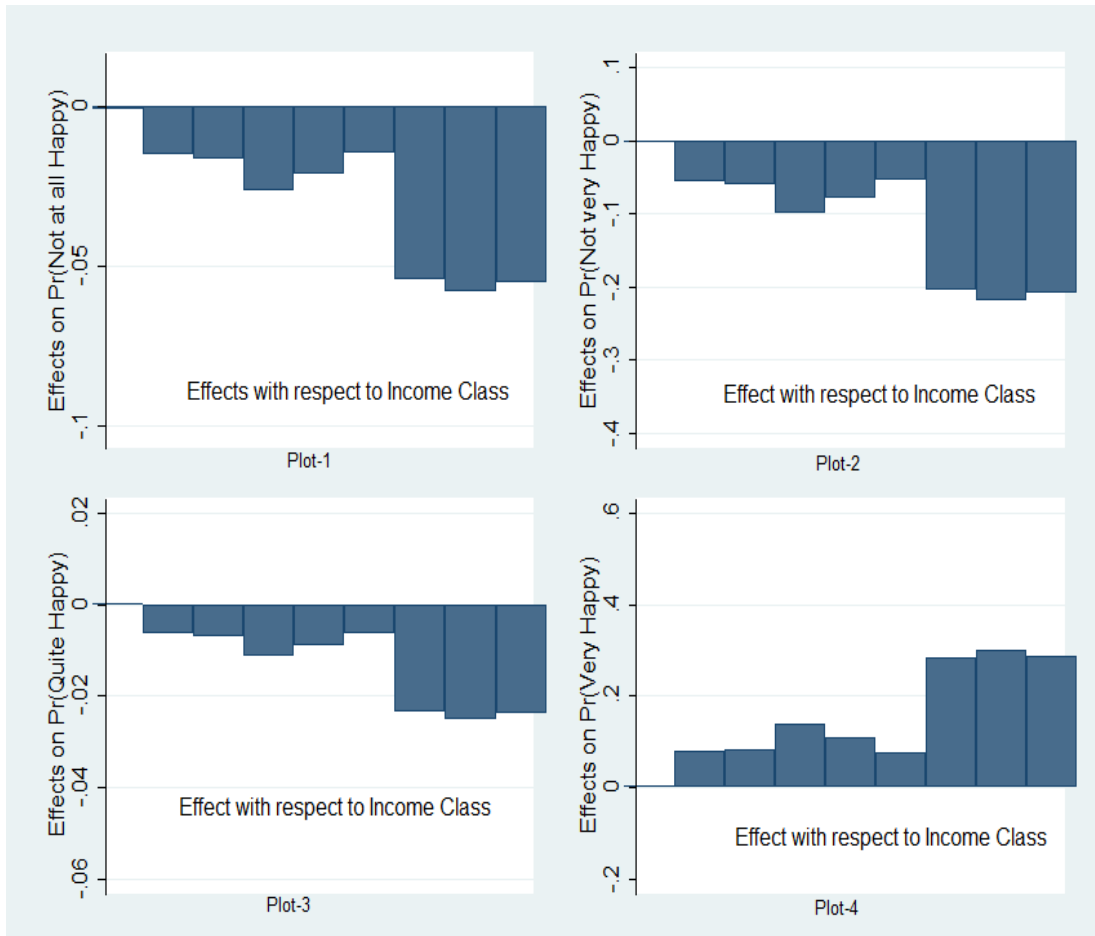
Source: Author's computation based on WVS data of 1996 and 2002 from Bangladesh.

This study also fails to provide evidence of concavity in the happiness-income relationship in the second year (Figure 5.2). As shown in Figure 5.2, marginal effects become stronger in magnitude as income levels start increasing from a lower level. In year two, this study assumes greater importance of happiness at lower income levels.

Figure 5.2: Marginal Probability Effects of Income on Happiness in 2002
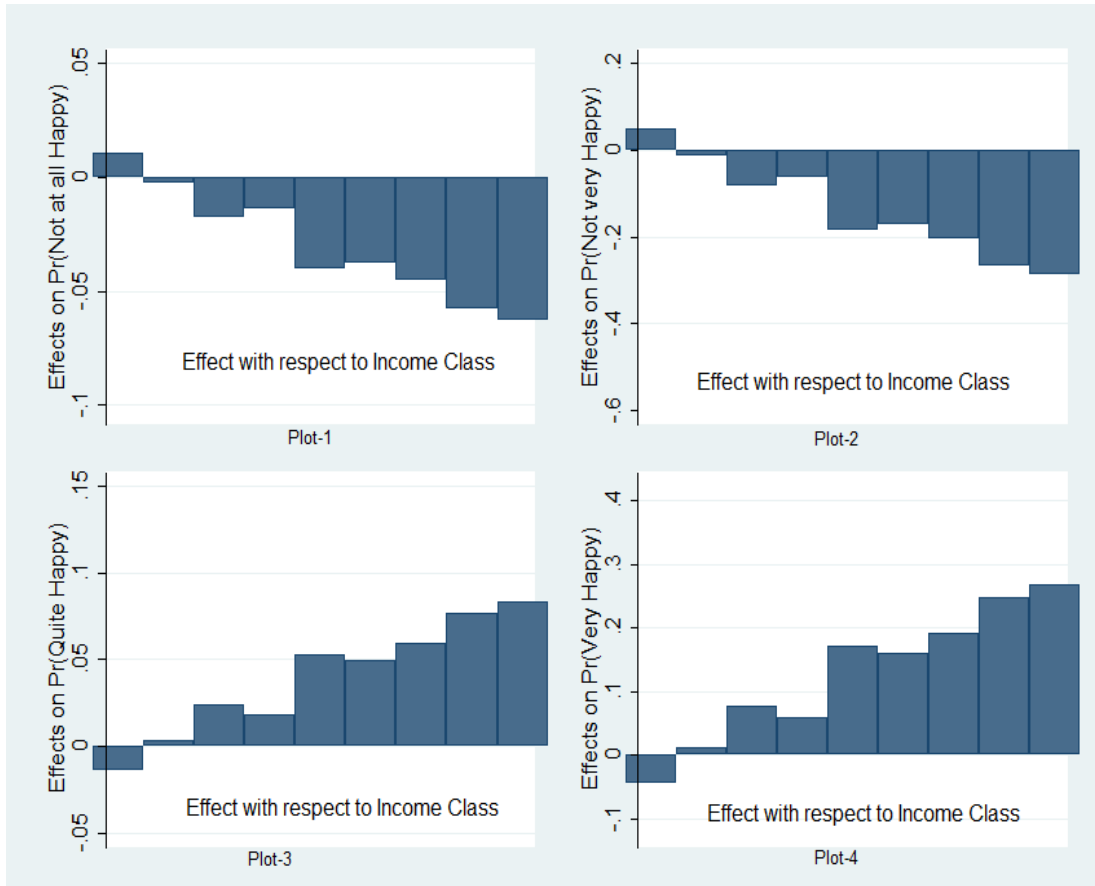
Source: Author's computation based on WVS data of 1996 and 2002 from Bangladesh.

Social Classes

It is anticipated that one's social status can potentially influence happiness, along with income. Theoretically, a higher social class implies a higher level of happiness. The negative effect of *not at all happy* and *not very happy* and the positive effect of *very happy* for both middle and upper classes confirm this argument. Columns 1 to 4 of Table 5.1 explains that the marginal effect of one-unit graduation in the household class from middle to upper class compared to working class in the society decreases the probability of stating *not at all happy* and *not very happy* by 1.9 and 6.5 percentage points, respectively. On the other hand, it increases the likelihood of a person stating *very happy* by 9.7 percentage points for the first year. Interestingly, the marginal effects for the middle and upper classes are almost similar.

The second-year exhibits change in determinants of happiness: being an upper-class individual. When marginal effects of being an upper-class individual remain the same, they are no longer statistically significant. Although being middle class exerts significant effects on almost all happiness levels, the magnitude of the marginal effect is lower compared to year one.

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Relative Position

An individual's relative social position in society is another influential determinant of happiness; for which a high positive association with happiness is expected if the relative social position is above the average social position. It turns out to be highly significant for all happiness levels except for the level *quite happy*, showing the association between social position and happiness in both years. Results show that individuals whose social position is above the average social position are less likely to report *not at all happy* and *not very happy* but more likely to report *very happy* compared to people whose social class is below the average social class.

On the other hand, relative income position is insignificant in both the years, showing no explanatory power in the happiness equation. One possible explanation is related to the fulfilment of basic needs. Until basic needs are fulfilled, the relative difference in income does not matter for individual happiness (Graham 2011). Absolute income captures all the pecuniary effects on happiness.

Individual and Socio-economic Controls

Among the control variables, men are more likely to report *not at all happy* and *not very happy* but less likely to report *very happy* than women in year one. Being male increases the probability of reporting being *not at all happy* and *not very happy* by 0.9 and 3.2 percentage points, respectively, it decreases stating *very happy* by 4.8 percentage points. But, in the next year, these results are insignificant, showing the declining power of gender in the happiness function.

Married people are happier than single or never married. Specifically, getting married increases a person's likelihood of stating that they are very happy with their life by 5.4 percentage points in year one, though it is insignificant in year two. From a large body of studies conducted for different countries and time periods (e.g., Diener *et al.* 2000, Stack and Eshleman 1998), it appears that marriage goes hand in hand with higher happiness levels. Married persons report greater subjective well-being than persons who have never been married or divorced, separated or widowed. Argyle (1999) emphasizes two reasons marriage contributes to greater well-being: First, marriage provides additional sources of self-esteem, for instance by providing an escape from stress in other parts of one's life, particularly one's job. It is advantageous for one's personal identity to have more than one leg to stand on. Second, married people have a better chance of benefiting from a lasting and supportive intimate relationship and suffer less from loneliness. However, the difference in happiness between married people and people who never married has fallen in recent years. The "happiness gap" has decreased because those who have never married experienced increasing happiness and those who have married experienced decreasing happiness (Lee *et al.* 1991). Therefore, there is a growing tendency among young people to get

married later. Also, a growing tendency among young partners to live together and have kids without any marriage bonding.

As expected, good health has a stronger effect on people's level of happiness in both years. The weak health condition of any of the members in the household is a cause of crises. It is also a factor in the 'reproducing pattern of poverty (Camfield *et al.* 2006) as it increases the household's sudden expenditure on health care. Improvement in the status of health from poor to fair reduces the probability of stating being *not at all happy* by 1.8 percentage points and the probability of stating being *very happy* by 9.1 percentage points. Similarly, a change in health status from poor to good has a much stronger effect (18.3 percentage points) on a person's reporting being *very happy,* which implies that better health status leads to a higher level of happiness. The marginal effects on happiness are stronger in year two. Hence, health turns out to be a core determinant of happiness for Bangladeshis.

Unemployment is a major source of human suffering (Di Tella *et al.* 2001). Unemployed people are more likely to report themselves as not at all happy and not very happy compared to employed people. Moving from unemployment to employment increases the probability of an individual stating being very happy by 10.3 percentage points. But the effect also depends on the quality of public services. Social protection schemes are very weak in Bangladesh and for the unemployed person, there is no statutory benefit from the state.[33] So, being unemployed is expected to have a stronger negative effect on the level of happiness.

Unemployed variable shows opposite effects in two years. In the first year, all coefficients are statistically significant with expected signs. On the contrary, in the second year, coefficients are lower but statistically insignificant. Additionally, they also show the opposite sign. The lack of significance may depend on the incidence of unemployment in two years. Therefore, the percentage distribution of unemployed people is plotted for both waves considered to see if this is indeed the case (Figure 5.3).

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[33] According to the labour law of 2006, only workers in commerce and industry are supposed to receive a termination benefit, a retrenchment and layoff benefit, and a benefit for discharge from service for any kind of health-related issue. Permanent employees with monthly salaries will receive half of the average basic wage for 120 days (plus a lump-sum payment of 1 month for each year of service); casual workers for 60 days (plus a lump-sum payment of 14 days of wages for each year of service) and temporary workers for 30 days. Source: http://www.ssa.gov/policy/docs/progdesc/ssptw/2010-2011/asia/bangladesh.html

Figure 5.3: Number of Unemployed People in Different Years (Percentage)
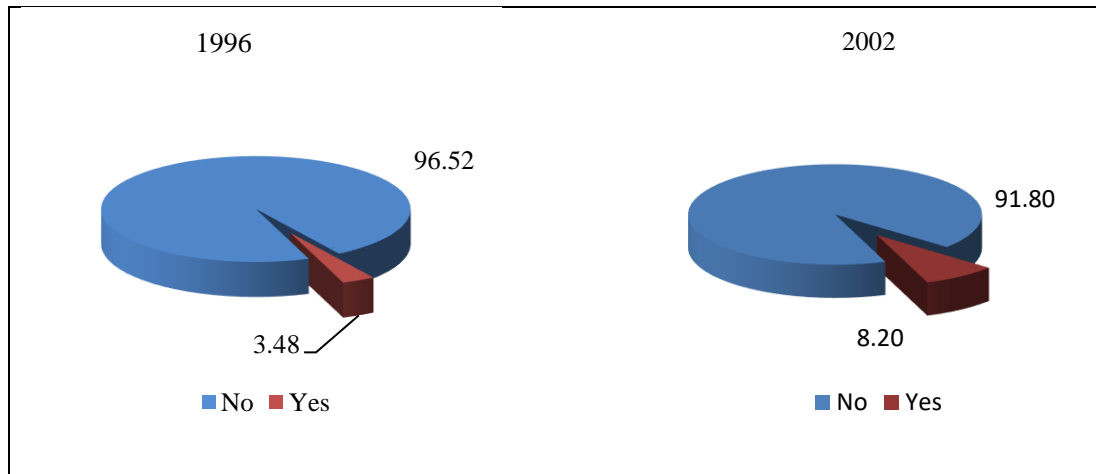
From the figure, it is clear that the incidence of unemployment is higher in year two than in year one (8.2 per cent of the sample against 3.5 per cent of the sample). According to the national statistics of the unemployment rate from 1995/96, 1999-2000, and 2002–03 surveys, the unemployment rate was 2.5, 3.29 and 4.30 per cent, respectively (BBS 2005, 2010). Hence, there is a trend of an increasing rate of unemployment in the national statistics although this study sample does not reflect the same pattern. Between two time periods considered, this variable changes its pattern and affects the level of happiness of an individual.

This study includes religious denomination variables to capture the probable impact of religion on happiness. As around 90 per cent of the population in Bangladesh are Muslim,[34] the religious denomination may not reflect the true picture of the happiness-religion relationship. But to see the variation in happiness across different religions, this study controlled for religion in the econometric model. Among all religion variables, only Christian turns to be significant throughout a different level of happiness in both years. Being a Christian decreases the probability of stating *not at all happy* and *not very happy* and increases the probability of stating *very happy* compared to Muslims. That means belonging to a particular religion does not generate a significant effect on happiness across the two years.

In the case of variable freedom of choice, the marginal effects are somewhat similar in both years. A one scale improvement in freedom of choice lowers the probability of stating *not at all happy* by 0.2 percentage points and increases the probability of stating *very happy* by 1.4 percentage points in year two.

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[34] According to Bangladesh Demographics Profile (2013), the religious distribution is Muslim 89.5 per cent, Hindu 9.6 per cent, other 0.9 per cent (2004). Accessed 11 September 2013. <http://www.indexmundi.com/bangladesh/demographics_profile.html>.

The most important change observed between years is through the variables age and age squared. The negative marginal effects of age and positive effects of age squared become statistically significant across the happiness scale in two years. Therefore, comparing the information from the descriptive analysis, in Figure 4.4, it appears that happiness is high for young people, declines at middle age (reaches the minimum at age 35 to 44) and then increases again at an older age consistent with other studies (e.g., Kahneman and Krueger 2006).[35]

This study finds some weak evidence of higher education exerting a lower level of happiness for the individuals in year two. Compared to uneducated people, higher education significantly lowers the probability of being *very happy* by 6.9 percentage points. But the marginal effects are significant only at the 10 per cent level. This variable is positive but insignificant in the first year. Some literature explains the co-variation of education with income and occupational status as a factor responsible for this weak relationship (Cambell 1981, Witter *et al.* 1984). Hence, when income is controlled for, the effects of education turn to be insignificant or even negative on happiness (Campbell *et al.* 1976, Diener *et al.* 1992). Our finding supports this statement of the negative effect of education on happiness.

5.2 Pseudo-Panel analysis

In the fixed-effect model, income class coefficients are highly significant, except for the income class of Tk. 35,501 to Tk. 45,000, suggesting that, over time, graduation in income class increases the proportion of happy people within cohorts. Thus, individual income class has a stronger positive effect on the level of happiness over time within the cohort, contrary to the findings from the cross-section, which supports only the effect from the high-income class (Table 5.2).

Table 5.2: Happiness Model with Cohort Effects

Name of variables	(1) Random Effect Model	(2) Fixed Effect Model
Income Levels (Base: Tk. Up to 5000)		
Tk. 5,001 to 10,000	-0.395	0.442***
	(0.653)	(0.0952)
Tk. 10,001 to 15,000	-0.270	1.049***
	(0.472)	(0.147)
Tk. 15,001 to 20,000	0.123	0.300**
	(0.133)	(0.123)
Tk. 20,001 to 25,500	0.166	0.247***
	(0.150)	(0.0472)
Tk. 25,001 to 35,000	0.344	0.708***
	(0.313)	(0.108)

(Contd. Table 5.2)

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[35] Kahneman and Krueger (2006) found that younger people are generally happy. The happiness level is lowest for teenagers, but after that, it starts improving.

Name of variables	(1) Random Effect Model	(2) Fixed Effect Model
Tk. 35,501 to 45,000	-0.135	0.0845
	(0.423)	(0.167)
Tk. 45,001 or more	0.901	0.962***
	(0.768)	(0.105)
Social Class (Base: Lower/working Class)		
Middle Class	0.0765	0.316***
	(0.113)	(0.0350)
Upper Class	0.0813	0.503***
	(0.378)	(0.121)
Relative Position		
Social Position	-0.0394	0.361***
	(0.193)	(0.0613)
Income Position	0.0477	0.313***
	(0.285)	(0.0606)
Marital Status (Base: Single)		
Widowed	-0.272	-0.372
	(0.421)	(0.239)
Divorced/Separated	-0.272	-5.742***
	(1.394)	(0.470)
Living together as Married	-0.967	-5.734***
	(1.012)	(0.614)
Married	0.0881	-0.242
	(0.277)	(0.159)
Health Status (Base: Bad Health)		
Fair	0.568	1.782***
	(0.400)	(0.188)
Good	0.511	1.843***
	(0.390)	(0.264)
Freedom of Choice	0.251*	1.367***
	(0.145)	(0.103)
Age	-0.000256*	-0.0129***
	(0.00197)	(0.00278)
Unemployed	-0.0249	-0.214**
	(0.362)	(0.0795)
Average observations per cohort	48	48
Overall R-squared	0.783	0.998
Number of Cohorts	24	24

Note:

- Dependent variable: Proportion of happy people. Happiness is an ordered variable of four. For making it proportional, we generated the dichotomous dependent variable by collapsing the dependent variable into happy and unhappy. The generated variable is coded as 1 if the original variable is coded 3 or 4 (quite happy and very happy) and 0 otherwise (not at all happy and not very happy). Then the proportion of people happy in each cohort is counted.
- Standard errors are in parentheses adjusted for heteroscedasticity and corrected for the clustered design of the sample.
- *** $p<0.01$, ** $p<0.05$, * $p<0.1$
- Cohorts are based on two years of WVS data, 1996 and 2002.
- Cohorts and year dummies are included.

The tests of the adjacent coefficient of social class and relative position were positive and statistically significant, which suggest that the proportion of happy people increases with improvement in social class and individual relative position.

In order to control changes in the cohort's proportion of married people, four marital status variables are included. These variables measured the proportion of people in a cohort having specific marital statuses. It is expected to have a negative association of all three marital statuses, such as widowed, divorced/separated and living together, with the proportion of happy people and positive association with the married variable.

As expected, the coefficients of divorces and living together as married are negative, suggesting a negative relationship between proportions of happy people with these variables. Divorced/separated makes people unhappy (Graham *et al.* 2004), so the probability that the proportion of happy people would fall if there is an increase in divorced/separated people in a cohort. For the living together variable, this study finds a negative effect on the proportion of happy people. In a conservative society like Bangladesh, living together is not socially accepted, and people usually bear some negative concept about this kind of relationship. Religion is the influencing factor here, as according to Muslim law, without legal marriage, males and females are not allowed to live together. It is also not well accepted in society. But it is praactised and accepted only in some upper-class families in Dhaka city, the capital of the country (Zahid 2007). From that perspective, a negative effect on happiness is expected.

Health status and freedom of choice variables are positive in the pseudo-panel also. As can be seen from the cross-sectional analysis across the years, these variables have a highly significant marginal effect on happiness. Over time, they maintain the same positive and significant trend across the cohorts.

The age and unemployment variables bear the expected negative effect on the proportion of happy people in a cohort. In the life cycle pattern of Bangladeshis, the proportion of happy people declines as age increases. In the cross-section model, although age fails to generate a significant effect on happiness, over time, the proportion of happy people falls in each cohort if the cohort's average age increases. Similarly, the unstable variable unemployment has a stronger negative effect on the proportion of happy people.

Therefore, our findings show that, within a cohort, moving from a low income to a high-income class is significantly associated with an increase in the proportion of happy people. It supports the statement that income matters for happiness within the cohort. Over time changes in variables, such as social class, relative position, marital status (divorced/separated and living together as married), health status, age and unemployment, affect the proportion of happy people within a cohort. Therefore, they are responsible for changes in happiness over time.

CHAPTER 6

SUMMARY AND CONCLUSIONS

The primary focus of this study has been to identify the determinants of individuals' happiness in Bangladesh. The motivation for delving further into this topic stems from counter-intuitive reports of a high level of happiness in an unarguably low-income country such as Bangladesh. There have been an ample number of arguments about the correlates of happiness in poor countries. Some argue that income and wealth are weak determinants of happiness in a poor country (e.g., Schyn 2003), while others insist that income is a better predictor of happiness in a poor country than in a rich country (Veenhoven 1991, Oishi *et al.* 1999). Moreover, some studies suggest that other factors such as health, family, education, security, etc., play an equally important role in determining individuals' happiness like income (see, for example, Diener and Diener 1995). This study attempts to analyse which of these contrary arguments rings true in the case of Bangladesh using data from the WVS to assess the correlates of happiness.

The results from the descriptive statistics show that around 85 per cent and 77 per cent of the respondents from Bangladesh report themselves as happy in 1996 and 2002, respectively. Compared to other developing countries (e.g., Brazil, Ghana, Argentina, Chile, Nigeria, etc.[36]), this reported level is much higher. It is even higher than other South Asian countries (e.g., India, Nepal and Pakistan[37]) with comparable levels of GDP per capita. This study also observes two interesting phenomena in descriptive statistics. First is the declining effect of increased women's labour force participation on individuals' happiness. Second, the positive effect of the government's 'Old Age Allowance Programme' can be linked with the increase of the average level of happiness for people aged over 55 to 64.

The econometric results of this study support the argument made by most literature in the area that income plays a key role in determining the happiness of impoverished societies. After controlling for other factors, this study still finds a positive and highly significant effect of income on happiness in both years. Importantly, the social status of individuals also influences happiness, as well as income. A similar positive effect has also been found from the relative social position. An individual whose social position

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[36] According to the ranking of the percentage of happy people by Worcester (1998) using WVS data, Bangladesh ranks 22, Argentina ranks 27, Brazil ranks 28, Chile ranks 31, Nigeria ranks 37, Ghana ranks 39, and India 40.

[37] For Nepal and Pakistan, the happiness ranking is available only in the report of the Happy Planet Index. They report Bangladesh is in 11th position of the ranking, while Nepal and Pakistan are in 58th and 16th position, respectively (2010: 26).

is above the average social position is more likely to report *very happy* than an individual whose social class is below the average. The results also show statistically significant effects of other variables such as health status and freedom of choice on individual happiness. An increase in individuals' freedom by one point on the rating scale raises the probability of a *very happy* life by 1.2 and 1.4 percentage points in the year 1996 and 2002, respectively; it is consistent with our hypothesis. Hence, a single point in time relationship confirms that income classes, social classes, relative social position, freedom of choice and health status of the individuals are the core determinates of happiness.

However, our cross-section study is based on two years of data from the WVS, which came through the interview of different individuals in different time periods. Panel data on happiness is rare in developing countries as compared to developed countries. The unavailability of panel data is also a concern for doing research on happiness.[38] To the extent that unobserved individual heterogeneity influences happiness, results from cross-section analysis are biased in an unknown direction. Additionally, this also implies that this study has not been successful to attribute changes in happiness, over time, to any variable at the individual level. To partially offset this limitation, a pseudo-panel is constructed based on appropriate cohorts from the two periods capturing the people of the same gender, age and having the same level of education. It will help observe the changes in the proportion of happy people within each cohort for a change in any of the explanatory variables. The pseudo-panel results also support the results from cross-section analysis. Changes in the five determinants from cross-section analysis produce a similar effect on changes in happiness. The positive effect from income classes explains that graduation within income classes increases the proportion of happy people within a cohort. The effects become stronger once income starts increasing: a finding which concurs with results from the cross-sectional analysis. Among other variables, social classes, relative social position, health status, and freedom show a similar pattern of effect on changes in happiness over time.

In conclusion, it can be said that while data from happiness polls seem to suggest the existence of the happiness paradox in Bangladesh, this study reveals the dangers of linking happiness to countries rather than individuals. The evidence of this study indeed concurs with conventional arguments made by several studies that income is indeed a significant factor in determining an individual's happiness. A closer examination of the income gradient shows higher levels of country-level happiness are driven by relatively higher income categories. This study also reinforces the importance of complementary conditions such as good health, freedom of choice, etc., in determining happiness levels.

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[38] For this research, we get only two years of data of WVS collected from Bangladesh, where six years have been executed from 1981 to 2013 for the developed country (WVS: 2012).

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APPENDICES

Appendix A: Experienced Well-being Worldwide

Map A.1: Map of Experienced Well-being Worldwide
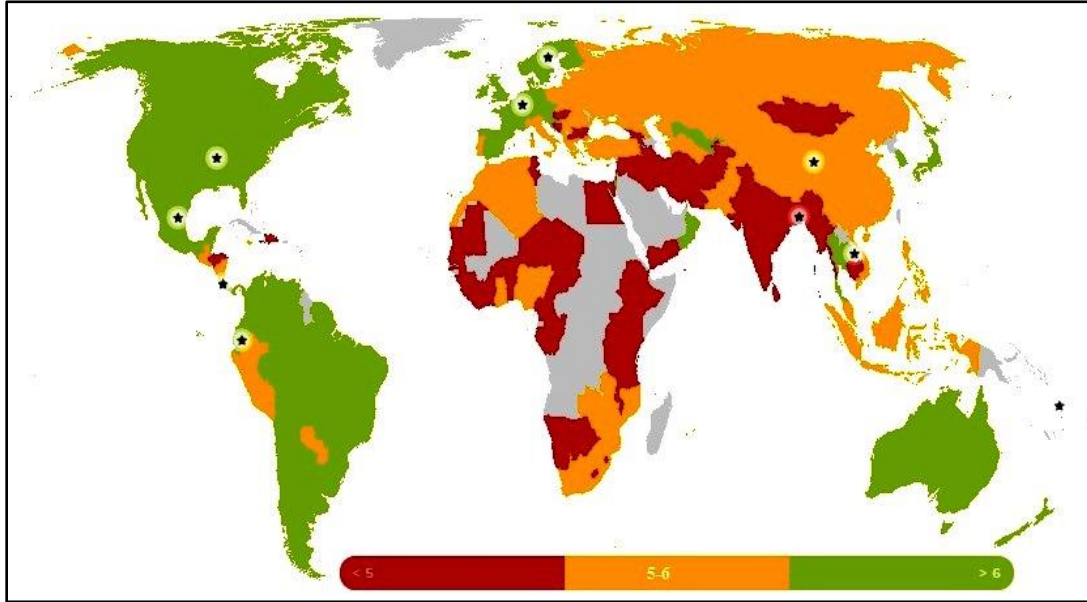
Source: Adapted from http://happyplanetindex.org/, Accessed 20 May 2021.

Appendix B: Some Salient Features of Bangladesh

Unemployed Population

This table shows that over time number of unemployed populations in Bangladesh are increasing. It has increased from 1.3 million in 1995-96 to 2.7 million in 2009. In the case of male, the annual average increase is 0.06 million while for female it is 0.05 million from 1995-96 to 2009.

Table B.1: Unemployed Population by Gender (Millions)

Year	Total	Male	Female
1995-1996	1.3	0.9	0.4
1999-2000	1.8	1.1	0.7
2002-2003	2.0	1.5	0.5
2005-2006	2.1	1.2	0.9
2009	2.7	1.7	1.0

Source: Data compiled from different years' statistics of Bangladesh Bureau of Statistics.

Corruption Scenario

Map B.1: Corruption Perceptions Index 2012
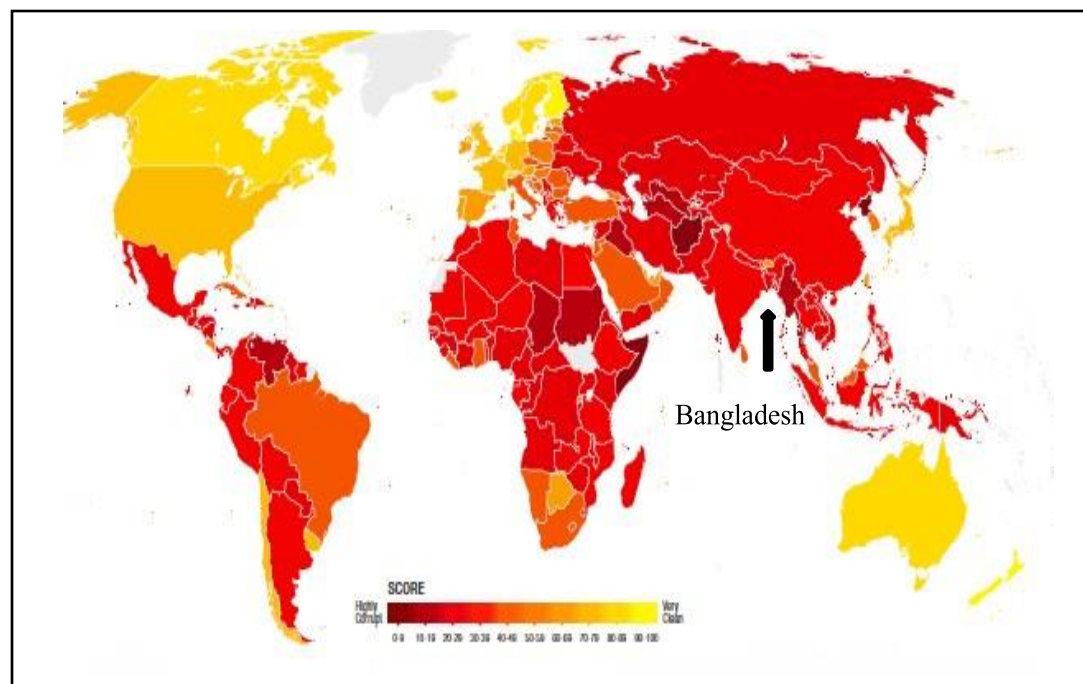
Source: Transparency International Bangladesh (2012: 3).

Appendix C: Construct of Pseudo-Panel

Table C.1: Number of Individual in each Cohort by Years

Cohorts	Survey Year		N_1	Survey Year		N_2
	1996	2002		1996	2002	
Male with No Education Born:						
1909-1934	1	1	2	7	1	8
1935-1960	1	1	2	33	26	59
1961-1986	1	1	2	43	94	137
Male with Higher Secondary level Education Born:						
1909-1934	1	1	2	6	8	14
1935-1960	1	1	2	115	62	177
1961-1986	1	1	2	324	397	721
Male with Bachelor Degree Born:						
1909-1934	1	1	2	2	1	3
1935-1960	1	1	2	27	6	33
1961-1986	1	1	2	91	54	145
Male with Masters Degree Born:						
1909-1934	1	1	2	2	1	3
1935-1960	1	1	2	11	2	13
1961-1986	1	1	2	17	19	36
Female with No Education Born:						
1909-1934	1	1	2	14	4	18
1935-1960	1	1	2	36	41	77
1961-1986	1	1	2	24	38	62
Female with Higher Secondary level Education Born:						
1909-1934	1	1	2	19	12	31
1935-1960	1	1	2	250	177	427
1961-1986	1	1	2	228	348	576
Female with Bachelor Degree Born:						
1909-1934	1	1	2	2	2	4
1935-1960	1	1	2	90	24	114
1961-1986	1	1	2	112	113	225
Female with Master's Degree Born:						
1909-1934	1	1	2	2	3	5
1935-1960	1	1	2	28	19	47
1961-1986	1	1	2	42	48	90
Total	24	24	48	1525	1500	3025

Note: N_1- Total Synthetic Individual; N_2- Total Number of Individuals.
Source: Authors' Computation based on WVS data of 1996 and 2002 for Bangladesh.

Construction of Cohorts

24 cuts are made for placing the individual at least in one cohort each year. The cuts are made to break down the sample based on age cohort defined by year of birth, gender cohort and education cohort. Construction of cohort follows the assignment of individual identification (Id) in each year by following classes:

We assign:

- Id=1 if the individual is a male with no education and year of birth falls under the group of 1909-1934;

- Id=2 if the individual is a male with no education and year of birth falls under the group of 1935-1960;

- Id=3 if the individual is a male with no education and year of birth falls under the group of 1961-1986;

- Id=4, 5, 6…...12 continues for a male person of higher secondary, bachelor or master's level education with three different age groups.

- For the female, the same process continues from Id 13 to 24. Then we repeated the procedure for year two. After that, we got 48 individual Id representing 48 cells of cohort mean data.

Each cohort is constructed in such a way that it includes all individuals of a specific age group, gender and education level in a specific cohort. Then, we arrange the data in such a way that the first individual of the first line of the year 1996 is the same in the first line of the year 2002. Thus, the repeated time cross-section data turns out to be panel data for a different year in the same individual.

Appendix D: Hausman Test Statistics

Hausman test is the common test used by the researcher to justify which model is appropriate in the presence of time-varying explanatory variables. The common way is to run both random effect and fixed effect model and run the test. The test results will suggest the model appropriate in this case. If the test fails to reject the null hypothesis, then random effect model is more efficient than fixed effect although the results are close to the each other. A rejection means time-varying factor is not random and the random effect assumption is false. Hence, one should go for the fixed effect estimates (Wooldridge 2009: 493).

Table D.1: Results from Hausman Test

Variables	Coefficients			
	Fixed	Random	Difference	S.E.
	(b)	(B)	(b-B)	
Tk. 5001 to 10000	0.442	-0.395	0.837	0.512
Tk. 10 001 to 15000	1.049	-0.270	1.319	0.254
Tk. 15001 to 20000	0.300	0.123	0.176	0.214
Tk. 20 001 to 25 500	0.247	0.166	0.081	0.107
Tk. 25 001 to 35000	0.708	0.344	0.363	0.291
Tk. 35 501 to 45 000	0.084	-0.135	0.220	0.268
Tk. 45 001 or more	0.962	0.901	0.062	0.965
Middle Class	0.316	0.077	0.239	0.129
Upper Class	0.503	0.081	0.422	0.286
Relative Social Position	0.361	-0.039	0.401	0.200
Relative Income Position	0.313	0.048	0.265	0.235
Widowed	-0.372	-0.272	-0.101	0.249
Divorced/Separated	-5.742	-0.272	-5.470	1.331
Living together as Married	-5.734	-0.967	-4.767	1.998
Married	-0.242	0.088	-0.330	0.129
Health Status: Fair	1.782	0.568	1.214	0.079
Health Status: Good	1.843	0.511	1.332	0.366
Age	-0.013	0.0003	-0.013	0.005
Freedom	1.367	0.251	1.116	0.059
Unemployed	-0.214	-0.025	-0.189	0.318

b = Consistent under Ho and Ha; obtained from xtreg

B = Inconsistent under Ha, efficient under Ho; obtained from xtreg Test: Ho: difference in coefficients not sy]stematic

chi2(21) = (b-B)'[(V_b-V_B)^(-1)](b-B)=558.98

    Prob>chi2 = 0.0000

    (V_b-V_B is not positive definite)

Note: SE= Standard errors.
Source: Author's computation based on WVS data of 1996 and 2002 for Bangladesh.

The results from the Hausman test support that the fixed effect is consistent for this analysis. The *P* value (p=0.000) from the Hausman test statistics fails to accept the null hypothesis that cohort-specific fixed effects are uncorrelated to the error term. Thereby, the test confirms fixed effect model is consistent for this analysis.

Appendix E: Description of Selected Variables for Econometric Analysis

Table E.1: Description of Variables Used in the Estimation Process

Name of Variables	Description
Happiness	Happiness: Taking all things into consideration in his life how happy individual feel? 1= Lowest; 4= Highest
Income Class	Household total income in scale (excluding taxes and transfers): 1= up to Tk. 5,000, 2= Tk. 50,001 to 10,000, 3= Tk. 10,001 to 15,000, 4= Tk. 15,001 to 20,000, 5= Tk. 20,001 to 25,500, 6= Tk. 25,001 to 30,000, 7= Tk. 30,001 to 35,000, 8= Tk. 35,501 to 40,000, 9= Tk. 40,001 to 45,000, 10= Tk. 45,001 or more
Social Class	Subjective perception of which social class respondent's household belongs to comparing others in the society. 1=working/lower class, 2=middle class, 3= upper class.
Relative Social Position	Individual social class compared to average social class in the locality: 1= Above; 0= Below
Relative Income Position	Individual Income class compared to average Income class in the locality: 1= Above; 0= Below
Age	Age
Age^2	Age Squared
Children	No of Children
Marital Status	1= Single; 2= Widowed; 3= Separated; 4= Divorced, 5= living together; 6= Married
Education Status	1=never studied; 2= primary education; 3= secondary school (SSC); 4=higher secondary (HSC); 5= bachelor degree; 6= masters/similar other degree.
Health Status	Current state of health: 1=Poor; 2=Fair; 3= Good
Religious Denomination	1= Muslim; 2= Hindu; 3= Christian; 4= Buddhist
Freedom	Freedom of choice and Decision making: 1= Not at all; 10= A great deal
Unemployed	1= Unemployed, 0= Employed
Savings	Whether Household saved during the past year or not? 1=Saved last year, 0=otherwise

Appendix F: Multicollinearity and Variance Inflation Factor (VIF)

As an indicator of multicollinearity in a multiple regression model, researchers commonly use the variance inflation factor (VIF). A low value of VIF, which is desired, indicates that the standard errors are not inflated by multicollinearity. A high value can adversely affect the results of the model, so dropping one variable of the collinear variables is necessary for getting efficient estimates. The maximum value of 10 as an acceptable value of VIF has mostly been recommended as a sign of severe or serious multi-collinearity (Kennedy 1992, O'brien 2007).

Hence, using this recommended value, we find no severe multicollinearity among the dependent variables except for age and age squared. As age squared is generated from squaring the age variable, it is expected that they are collinear. Therefore, considering this, this study runs the model with full specification including all variables.

Table F.1: Results from the Test of Multi-collinearity

Name of Variables	1996		2002	
	VIF	1/VIF	VIF	1/VIF
Tk. 5,001 to 10,000	1.740	0.576	3.340	0.300
Tk. 10, 001 to 15,000	2.490	0.402	6.370	0.157
Tk. 15,001 to 20,000	3.630	0.276	7.080	0.141
Tk. 20,001 to 25, 500	4.620	0.216	8.860	0.113
Tk. 25, 001 to 30,000	4.090	0.244	7.470	0.134
Tk. 30,001 to 35, 000	5.530	0.181	7.430	0.135
Tk. 35, 501 to 40, 000	3.920	0.255	4.830	0.207
Tk. 40, 001 to 45, 000	2.250	0.444	1.780	0.563
Tk. 45,001 or more	1.150	0.868	1.680	0.595
Middle Class	4.700	0.213	4.900	0.204
Upper Class	8.020	0.125	11.560	0.087
Social Position (Above=1)	4.390	0.228	5.560	0.180
Income Position (Above=1)	5.950	0.168	5.550	0.180
Primary Education	2.580	0.388	2.720	0.368
Secondary School	3.600	0.278	3.500	0.286
Higher Secondary School	3.740	0.267	2.990	0.334
Bachelor/Honors	4.050	0.247	2.990	0.335
Masters/ Similar	2.270	0.440	2.120	0.472
Age	46.700	0.021	35.260	0.028
$(Age)^2$	40.110	0.025	31.590	0.032
Widowed	1.600	0.625	1.260	0.796
Separated	1.070	0.933	1.100	0.913
Divorced	1.100	0.910	1.120	0.895
Living together as Married	2.410	0.415	1.060	0.939
Married			2.190	0.456
Gender (Male=1)	1.300	0.772	1.390	0.720
Fair	4.020	0.249	7.130	0.140
Good	4.330	0.231	7.280	0.137
No of Children	2.680	0.374	2.700	0.370
Saved in Last Year (yes=1)	1.380	0.724	1.440	0.693
Freedom of Choice	1.410	0.709	1.270	0.788
Hindu	1.090	0.920	1.080	0.924
Christian	1.090	0.915	1.050	0.953
Buddhist	1.040	0.961	1.050	0.956
Unemployed (=1)	1.100	0.908	1.270	0.789

Source: Author's computation based on WVS data of 1996 and 2002 from Bangladesh.

Appendix G: Descriptive Statistics

Table G.1: Descriptive Statistics for the Selected Variables

Variable	1996		Correlation	2002		Correlation
	Mean	Std. Dev		Mean	Std. Dev	coefficient
Happiness	3.01	0.629	1.00	2.9	0.656	1.00
Income of Individual						
1. Up to Tk. 5000	0.144	0.351	-0.126**	0.035	0.185	-0.059**
2. Tk. 5001 to 10000	0.095	0.293	-0.106**	0.073	0.261	-0.137**
3. Tk. 10 001 to 15000	0.166	0.372	-0.015	0.189	0.391	-0.124**
4. Tk. 15001 to 20000	0.162	0.369	-0.007	0.211	0.408	-0.0007
5. Tk. 20 001 to 25 500	0.161	0.368	0.072**	0.201	0.401	-0.033
6. Tk. 25 001 to 30000	0.077	0.267	0.021	0.109	0.312	0.125**
7. Tk. 30001 to 35 000	0.107	0.309	-0.013	0.105	0.306	0.105**
8. Tk. 35 501 to 40 000	0.062	0.241	0.158**	0.056	0.230	0.104**
9. Tk. 40 001 to 45 000	0.023	0.150	0.103**	0.011	0.103	0.065**
10. Tk. 45 001 or more	0.003	0.057	0.036	0.009	0.096	0.068**
Social Class						
1. Working Class	0.218	0.413	-0.258**	0.278	0.448	-0.261**
2. Middle Class	0.517	0.500	0.028	0.448	0.497	0.018
3. Upper Class	0.264	0.441	0.209**	0.274	0.446	0.242**
Relative Position						
Social Position (above=1)	0.431	0.495	0.221**	0.501	0.500	0.204**
Income Position (above=1)	0.445	0.497	0.235**	0.461	0.499	0.179**
Age	35.446	12.275	-0.049	33.774	10.923	0.013
$(Age)^2$	1406.99	1020.21	-0.045	1259.92	899.80	0.033
No of Children	2.296	1.997	-0.058**	2.351	1.965	-0.023
Saved in Last Year (yes=1)	2.093	0.964	0.159**	1.903	0.776	0.163**
Freedom of Choice	6.255	2.382	0.178**	5.702	2.108	0.199**
Gender (Male=1)	0.555	0.497	-0.055**	0.553	0.497	0.059**
Unemployed (=1)	0.035	0.183	-0.104**	0.082	0.274	0.038
Marital Status						
1. Single	0.210	0.408	0.016	0.192	0.394	0.056**
2. Widowed	0.031	0.175	-0.085**	0.011	0.103	-0.063**
3. Separated	0.004	0.063	-0.017	0.004	0.063	0.010
4. Divorced	0.006	0.077	-0.109**	0.007	0.081	-0.038
5. Living together as Married	-	-	-	0.005	0.068	0.10
6. Married	0.748	0.434	0.042	0.782	0.413	-0.034
Education Level						
1. No Education	0.103	0.304	-0.165**	-0.135	0.342	-0.183**
2. Primary Education	0.179	0.384	-0.097**	0.247	0.431	-0019
3. Secondary School	0.237	0.426	0.090**	0.270	0.444	0.054**

(Contd. Table G.1)

Variable	1996		Correlation	2002		Correlation
	Mean	Std. Dev		Mean	Std. Dev	coefficient
4. Higher Secondary School	0.203	0.403	0.081**	0.155	0.362	0.051**
5. Bachelor /Honours	0.211	0.408	0.018	0.132	0.339	0.075**
6. Masters/ Similar	0.066	0.248	0.035	0.061	0.239	0.013
Health Status						
1. Poor	0.083	0.275	-0.196**	0.047	0.212	-0.239**
2. Fair	0.449	0.498	-0.149**	0.370	0.483	-0.262**
3. Good	0.468	0.499	0.257**	0.583	0.493	0.359**
Religion						
1. Muslims	0.859	0.347	0.016	0.920	0.272	-0.041
2. Hindus	0.128	0.335	-0.022	0.071	0.258	0.030
3. Christians	0.010	0.099	0.010	0.004	0.063	0.026
4. Buddhist	0.002	0.044	0.023	0.005	0.068	0.025
N	1525			1500		

Note: **significant at 5 per cent level.
Source: Author's Computation based on WVS data of 1996 and 2002 from Bangladesh.

Figure G.1: Trend in Food and Non-food Inflation at National Level