UNIVERSIDAD DE GRANADA

DEPARTAMENTO DE MÉTODOS CUANTITATIVOS PARA LA ECONOMÍA Y LA EMPRESA

TESIS DOCTORAL

AN EMPIRICAL ANALYSIS ABOUT SUBJECTIVE WELL-BEING USING DEVELOPING AND DEVELOPED COUNTRIES DATA.

Doctoranda

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Editor: Editorial de la Universidad de Granada
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D.L.: GR 954-2012
ISBN: 978-84-694-9414-1

La memoria de tesis titulada "**An Empirical Analysis about Subjective Well-being Using Developing and Developed Countries Data**", que presenta la doctoranda Alexandra Cortés Aguilar para optar al título de Doctor en Economía, ha sido realizada en el Departamento de Métodos Cuantitativos para la Economía y la Empresa, dentro del programa de doctorado Empirical Economics, bajo la dirección de las Doctoras Victoria Ateca Amestoy, Teresa María García Muñoz y Ana Isabel Moro Egido.

Granada, julio de 2011.

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AGRADECIMIENTOS

Mi más profundo agradecimiento a mis tutoras Victoria Ateca Amestoy, Teresa García Muñoz y Ana Isabel Moro Egido, por ofrecerme siempre su asesoría, apoyo constante y su confianza. De cada una de ellas recibí más de una enseñanza. Gracias a Vicky por la orientación y motivación que me brindó para iniciar mi investigación. A Tere le agradezco muchísimo estar ahí siempre que la he necesitado, porque además de ser mi tutora, ha sido mi profesora, me ha dado su asesoría, consejos y enseñanzas, y siempre me ha recibido con una sonrisa dulce y amable. A Ana debo agradecer muchas cosas. De cada reunión con Ana salí siempre cargada de nuevas lecciones, de energía e ideas para mejorar mi trabajo, incluso algunas veces con una frase me ayudaba a encontrar respuesta a dudas que llevaban semanas en mi cabeza. Gracias a las tres por todas las correcciones, su compromiso y apoyo han hecho que mi trabajo mejore continuamente. Sin lugar a dudas, son grandes maestras de las que aún me queda mucho por aprender.

Gracias a la beca de formación de personal docente e investigador otorgada por la Secretaría General de Universidades, Investigación y Tecnología de la Junta de Andalucía. Además del apoyo económico, debido a las labores asociadas a esta beca tuve la oportunidad aprender y compartir experiencias con los profesores del Departamento de Métodos Cuantitativos para la Economía y la Empresa. A ellos muchas gracias por su amabilidad y por el ánimo que me han ofrecido durante todo este proceso. A Rosaura, mi compañera de despacho, quiero agradecer especialmente por compartir conmigo su experiencia profesional y personal, por escucharme y soportar mis momentos de estrés. A mis compañeros de doctorado gracias por compartir las alegrías y frustraciones de sus investigaciones, así como por escuchar las mías. A Estrella y a Melanie muchas gracias por brindarme su amistad.

Además de agradecimiento, tengo un compromiso con la Universidad Industrial de Santander. Cumplir el sueño de estudiar un doctorado hubiese sido mucho más difícil sin la comisión de estudios. Gracias a todos los que han estado pendientes de ayudarme y facilitarme los trámites, su labor ha sido muy importante para que yo pueda cumplir con mis obligaciones. Debo agradecer especialmente a Susana Valdivieso, quien me dio su apoyo, me motivó y me asesoró para emprender este proyecto. Espero poder contribuir con mi trabajo a construir la escuela que ella soñó.

Gracias a todos los que han estado pendientes de mi bienestar fuera del país, por sus mensajes de afecto, por su solidaridad y por hacerme sentir acompañada en la distancia. A mi familia por su cariño y constante apoyo. A mis padres, por todo su amor y comprensión, por perdonar mi ausencia y por enseñarme el valor del trabajo y la dedicación, todo lo que soy lo debo a ellos.

Por supuesto, mi gratitud infinita a Luis Alejandro, mi esposo, cómplice y compañero en este viaje de la vida. A nuestra empresa Palacio Cortés compañía iLimitada y a la nómina que ampliaremos con un par de integrantes.

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1. INTRODUCCIÓN.

La teoría microeconómica tradicionalmente ha abordado el concepto de utilidad con una visión *objetiva* basada en las preferencias reveladas. Es decir, observando las decisiones y las acciones que los individuos han realizado. Desde este punto de vista, se asume que las decisiones que toman los sujetos siguen ciertos criterios razonables, de tal forma que la función de utilidad que explica las preferencias individuales puede inferirse a partir del comportamiento observado (ver Mas-Colell et al., 1995; Varian, 2002). Aunque esta visión ha sido predominante, recientes estudios desde la economía del comportamiento y la psicología han mostrado diversas anomalías en los procesos de decisión (Rabin, 1998), cuestionando la validez de las conclusiones teóricas y empíricas que se derivan cuando el análisis se limita a la evaluación objetiva de las decisiones. De esta forma, la utilidad de las decisiones es considerada un indicador incompleto del bienestar individual.

En las últimas décadas, ha tomado fuerza la investigación económica sobre el bienestar subjetivo que usa la satisfacción auto-reportada como una medida aproximada de la utilidad individual. Ésta alternativa metodológica ha permitido contrastar empíricamente varias hipótesis económicas que anteriormente sólo habían sido discutidas teóricamente (Stutzer and Frey, 2010), ofreciendo con ello la posibilidad de discriminar entre diferentes propuestas teóricas y de rechazar algunos

modelos, así como sus posibles recomendaciones de política[1]. Desde esta perspectiva, el bienestar subjetivo es considerado un concepto mucho más amplio que el de la utilidad derivada de elecciones. Este incluye la *utilidad experimentada*, aquella que se basa en las experiencias de consumo o en los eventos vividos por los individuos en el pasado (Kahneman and Thaler, 2006), así como la *utilidad de procedimiento*, la utilidad derivada del simple hecho de participar o dedicarse a actividades preferidas por el individuo (Sen, 1995, 1997; Frey et al., 2004). De esta forma, los reportes directos del bienestar subjetivo revelan las percepciones que tienen los individuos de sus propias experiencias, proporcionando con ello indicadores más exactos de las preferencias de consumo y el bienestar social (Kahneman and Krueger, 2006).

La visión subjetiva del bienestar individual destaca que, aunque cada individuo tiene ideas propias sobre la felicidad y la calidad de vida, las personas están en capacidad de evaluar de manera consciente su bienestar subjetivo con respecto a sus propias circunstancias, a la comparación que hacen con respecto a otros, con respecto a su experiencia pasada y a sus expectativas de futuro (Frey and Stutzer, 2002). Así, las respuestas de los individuos a preguntas sobre su felicidad actual o su satisfacción con la vida, resultan ser un instrumento muy útil para estudiar la utilidad individual.

Si bien la utilidad individual se reconoce como inmensurable, la practicidad empírica de la visión subjetiva radica en que los individuos son capaces y están dispuestos a expresar su satisfacción en una escala cardinal. En términos generales, las preguntas de bienestar subjetivo que incluyen las encuestas buscan encontrar una medida de la evaluación global que hacen los individuos de su satisfacción[2]. Cada persona, cuando responde, clasifica su propia felicidad personal o su bienestar subjetivo en una escala numérica, tomando como base para su respuesta una serie de características personales, de su hogar, sus circunstancias sociales y su experiencia. Si se asume que estas preguntas pueden ser interpretadas de la misma forma por

[1] Ejemplo de ello son los modelos macroeconómicos que consideran el desempleo como voluntario contra aquellos que lo consideran involuntario. Otros ejemplos de este tipo son presentados por Frey y Stutzer (2003) y por Kahneman y Krueger (2006).

[2] En las encuestas se pregunta a las personas que tan satisfechas están con su situación financiera, laboral, vital, etc., y se les pide que respondan en una escala desde 'muy mala' a 'muy buena' o usando una escala numérica de 1 a 4 ó de 0 a 10.

diferentes individuos y se observa que individuos con características similares ofrecen respuestas similares, esto evidencia la posibilidad de realizar comparaciones interpersonales (van Praag and Ferrer-i-Carbonell, 2004). Sin embargo, el principal uso de estas medidas no es comparar niveles de bienestar en sentido absoluto, es identificar determinantes de la satisfacción individual[3].

Las aportaciones recientes de la economía en el área del bienestar subjetivo, frecuentemente denominado economía de la felicidad, han identificado una serie de factores socio-económicos determinantes del bienestar auto-reportado. Estos resultados se basan en grandes encuestas para distintos países a lo largo del tiempo, incluyendo información de cientos de miles de individuos a quienes se pide evaluar su propio bienestar. Factores como la salud, el estatus marital, la edad, el empleo y el capital social se reconocen como importantes determinantes del bienestar individual. Sin embargo, tal como resume Clark et al. (2008), los dos temas que han despertado mayor interés en la literatura son, (i) el efecto del estatus laboral, especialmente el desempleo, sobre la felicidad, y (ii) la relación entre el ingreso y la felicidad. En ambos casos, las evidencias empíricas señalan la importancia de las consideraciones relativas (Clark and Oswald, 1996; Ferrer-i-Carbonell, 2005), así como de las aspiraciones (Stutzer, 2004), en la función de utilidad.

Una de las carencias generales de esta literatura sobre la felicidad es que la investigación ha estado centrada mayoritariamente en las evidencias para países industrializados, principalmente debido a la calidad y cantidad de la información disponible para estos países con respecto a otros. Gran parte de las conclusiones son resultado de estudios econométricos que usan datos para Estados Unidos y/o Europa y por lo tanto distan de ser globalmente representativos. Si los efectos de la interacción social son tan relevantes en la determinación del bienestar subjetivo, es

[3] Diversos estudios han mostrado que, aunque estas medidas subjetivas pueden sufrir ciertos sesgos y errores de medida, son medidas validas, debido al patrón de correlaciones con otras características de los individuos y a su capacidad para predecir comportamientos futuros. Por ejemplo, individuos que manifiestan estar satisfechos con sus vidas son también clasificados como satisfechos por sus familiares y amigos (Sandvik et al., 1993). Destaca también que bajos niveles de satisfacción con la vida están relacionados con altas tasas de mortalidad y suicidio. Trabajos como el de Diener y Seligman (2004) y el de Kahneman y Krueger (2006) presentan revisiones más detalladas al respecto.

muy probable que la evaluación que hace un individuo del nivel de satisfacción que tiene con su vida dependa de la estructura social del país donde vive y del sistema de valores establecido en la sociedad en que ha crecido. Por ello, es de esperar que las personas en países menos desarrollados juzguen de forma diferente qué tan satisfechos están con sus vidas y que los factores que afectan su bienestar individual difieran de lo que se ha encontrado para países industrializados.

La reciente disponibilidad de información con respecto a felicidad y satisfacción auto-reportada en países menos desarrollados, ha permitido explorar muchos de los hallazgos previos en contextos diferentes, así como el estudio de otros posibles determinantes del bienestar subjetivo que no habían sido explorados anteriormente. Esta tesis aporta evidencia empírica sobre algunos de los determinantes del bienestar subjetivo que han sido previamente estudiados en países industrializados, usando datos de América Latina. Así mismo, se contrastan nuevas hipótesis que no han sido analizadas previamente usando el Panel Socio-económico Alemán.

El documento se organiza en las siguientes ocho secciones. El capítulo 2 presenta la metodología que sigue esta investigación, las premisas teóricas de la aproximación del bienestar subjetivo, así como los métodos de estimación que permiten el contraste de hipótesis sobre el comportamiento individual a partir de datos observados. El capítulo 3 resume la literatura relacionada. En el capítulo 4 se describen las dos grandes fuentes de datos que se van a emplear en los tres ejercicios empíricos que constituyen las tres aportaciones originales de esta tesis: el Latinobarómetro del año 2007 y las 17 olas (de 1992 a 2008) del Panel Socio-Económico Alemán. Los capítulos 5 a 7 contienen las tres contribuciones originales. Finalmente, el capítulo 8 resume las principales conclusiones de esta investigación y presenta las opciones de trabajo futuro.

El capítulo 5 estudia la relación entre el estatus laboral individual y otras características socio-económicas con dos medidas de bienestar auto-reportado: satisfacción con la vida y satisfacción con el trabajo. El análisis empírico usa

información de dieciocho países Latinoamericanos a partir de la encuesta Latinobarómetro del año 2007. Los resultados de este análisis son complementarios a los encontrados en estudios anteriores sobre América Latina (Graham and Petinato, 2001; Graham and Felton, 2006; Lora, 2008). En este capítulo se destaca la necesidad de analizar el autoempleo en América Latina como una categoría heterogénea. Aunque en países desarrollados se ha encontrado que, debido a la independencia de la que gozan, los trabajadores autónomos están más satisfechos con su vida y su trabajo que los trabajadores asalariados (Benz and Frey, 2008a, 2008b), en América Latina no ocurre lo mismo. Las evidencias encontradas en este documento muestran que los autónomos que se desempeñan como trabajadores ambulantes reportan significativamente menor satisfacción con su vida y con su trabajo que los empleados. Por otra parte, los autónomos profesionales y los propietarios de negocios están en promedio tan satisfechos con sus vidas como los asalariados y los propietarios de negocios están más satisfechos con su trabajo que los empleados. Al parecer, en estas dos últimas categorías de autoempleo el efecto de la independencia asociada a estas ocupaciones es similar a las evidencias para países desarrollados. Sin embargo, el riesgo y la variabilidad del ingreso asociada a los autoempleos precarios dominan el posible efecto positivo que pueda tener la independencia.

Usando los mismos datos del Latinobarómetro, el capítulo 6 estudia el efecto de las interacciones sociales, entendidas como relaciones y comparaciones sociales, en el bienestar subjetivo individual. Estudios anteriores (Helliwell and Putnam, 2004) han mostrado que relaciones sociales frecuentes se asocian con mayor felicidad individual, mientras las comparaciones con la riqueza de otros son consideradas una fuente de insatisfacción (Clark et al., 2008). Además de contrastar estas evidencias previas, la principal contribución de este capítulo es el análisis del efecto conjunto de las interacciones sociales. En este documento, se examina la importancia de las relaciones sociales como potenciadoras o amortiguadoras del efecto de la comparación sobre la satisfacción individual.

Los resultados de este estudio muestran que los contactos sociales son uno de los más importantes determinantes del bienestar subjetivo en América Latina. Las

comparaciones de riqueza tienen un efecto positivo significativo y no-simétrico sobre el bienestar individual, es decir, su efecto es distinto dependiendo de si el individuo tiene una riqueza superior o inferior a la del promedio del grupo de comparación. La evidencia también sugiere que los contactos sociales intensifican el efecto de la comparación sobre el bienestar auto-reportado. El efecto de la diferencia entre la riqueza propia y la del grupo de referencia sobre la satisfacción es mayor para personas con relaciones sociales activas. Adicionalmente, y considerando la presencia de asimetría en las comparaciones, la evidencia sugiere que aquellos con condiciones materiales inferiores a las del promedio y que participan activamente en redes sociales, pueden percibir como una externalidad positiva la mejora en la riqueza promedio del grupo de referencia.

En el capítulo 7 se usan datos longitudinales del Panel Socio-económico Alemán de 1992 a 2008 para estudiar el efecto no-simétrico de las comparaciones de ingreso en el bienestar subjetivo. Aunque estudios anteriores han mostrado que el ingreso promedio del grupo de referencia afecta el bienestar individual (Ferrer-i-Carbonell, 2005), algunas propuestas teóricas destacan la importancia de la información de toda la distribución del ingreso del grupo de referencia sobre la utilidad individual. Duesenberry (1949), por ejemplo, propuso la idea de la asimetría en las comparaciones, argumentando que las personas se comparan sobre todo con quienes están en mejores condiciones que ellos. De esta forma, las personas más ricas impondrían una externalidad negativa sobre las personas pobres, pero no lo contrario.

La evidencia empírica de este análisis muestra dos fuentes de asimetría en las comparaciones. En el primer caso, el efecto del ingreso promedio del grupo de referencia sobre el bienestar subjetivo difiere entre individuos con ingresos por encima o por debajo del promedio. Esto es, el efecto de las comparaciones es diferente para individuos ricos y pobres con respecto al promedio (Ferrer-i-Carbonell, 2005). Sin embargo, en este caso no se discrimina si existe un efecto diferencial cuando el ingreso promedio aumenta a consecuencia de la mejora en el ingreso de otros por debajo o por encima del ingreso propio.

Para analizar el efecto de las asimetrías propuestas por Duesenberry (1949), en el segundo caso se incorpora en el análisis la información del ingreso de todos los individuos en el grupo de referencia. Los resultados muestran que tales asimetrías están presentes. El bienestar individual se ve afectado de forma diferente dependiendo de si el individuo se compara con personas más ricas o más pobres que él. Sin embargo, complementario a la propuesta de Duesenberry, en este documento, la evidencia empírica sugiere que aumentos en el ingreso de los más ricos generan un efecto negativo en la felicidad, pero aumentos en el ingreso de los más pobres pueden tener un efecto positivo sobre el bienestar individual.

2. METHODOLOGY.

In order to assess the size of different influences upon happiness and satisfaction with life in general, psychologists have been using surveys since long ago. While only recently economists have recognized that there is useful information in the subjective well-being answers as an empirical approximation for the theoretical concept of utility. With the exception of the seminal work of Easterlin (1974), most of the research in this area has taken place during the last three decades. The existing state of research suggests that, for many purposes, happiness or reported subjective well-being is a satisfactory empirical proxy of individual utility. From the information about the determinants of individual happiness, different situations of economic and social policies inside a country or a region can be analyzed[4].

This chapter presents a brief explanation of the methodological issues associated to the empirical analysis of subjective well-being in economics. First, a description about subjective well-being indicators as valid and useful measures in the economic analysis is presented. Second section shall show the quantitative methods used for analyzing individuals' satisfaction questions.

[4] There is nascent consensus that happiness surveys can serve as an important complementary tool for public policy. Scholars such as Diener and Seligman (2004) and Kanheman et al. (2004) advocate the creation of national well-being accounts to complement national income accounts.

2.1. Using Subjective Well-Being Measures in the Economic Analysis.

As mentioned, psychological research has analyzed the sources of human satisfaction in detail since long time ago. A comprehensive review on the research progress in this field is presented by Kahneman et al. (1999). From this view, subjective well-being is conceived to be the degree of how individual evaluates her own life as a whole, or some particular domain of her life, as favorable (Veenhoven, 1993). In economics, this indicator offers a complementary approach to traditional welfare measures that focus on individual income or economic growth[5]. As Kahneman and Krueger (2006) affirm, direct reports of subjective well-being may have a useful role in the measurement of consumer preferences and social welfare.

Psychologists distinguish among life satisfaction, a cognitive element of happiness; affection, which is the affective component; and subjective well-being, the state of general well-being, which includes both the affective and cognitive component (Bruni and Porta, 2007). However, economists do not make a clear distinction between happiness, pleasure, satisfaction or welfare. Some (Frank, 1997, 2005; Layard, 2005) use the category subjective well-being simply as a synonym of happiness. Ng (1997) defines happiness as welfare. Oswald (1997) uses the self-evaluation of life satisfaction as synonymous of self-reported happiness. In this document the terms happiness, subjective well-being, utility, well-being, and welfare are used interchangeably, as in Easterlin (2001, p. 465).

As it is pointed out by Bruni and Porta (2007), economists do not generally define happiness, but they measure it empirically, on the basis of the answers to questionnaires. The study of happiness relies largely on evidence from surveys. Data about it are collected through direct questioning via interviews or self-administered

[5] Frey and Stutzer (2002) and Stutzer and Frey (2010) give some important reasons for economists to consider happiness research. First, happiness research can help to evaluate net effects, in terms of individual utilities, for different economic policies. Understanding the determinants of subjective well-being can thus usefully inform economic policy decisions. Second, this research also has relevance to economists because of the effect of institutional conditions such as the quality of governance and the size of social capital on individual well-being. It may also help to solve empirical puzzles that conventional economic theories find difficult to explain. For instance, using this approach it is possible to understand why for several countries since World War ll although they have raised their real income drastically, the self-reported subjective well-being of the population has not increased or has even slightly fallen.

questionnaires in which individuals self-rate their happiness or satisfaction on a single item or on a multi-item scale. These scales offer a list of options, which are ranked according to the levels of happiness[6]. One of the most commonly used measures is the standard life satisfaction question, which can be found in the Eurobarometer and Latinobarómetro survey. The life satisfaction question in the Latinobarómetro asks: "*Would you say that you are: (a) very satisfied, (b) fairly satisfied, (c) not very satisfied, (d) not at all satisfied?*". Some surveys offer a numerical scale. For instance, the German Socio-Ecomonic Panel – GSOEP – asks: "*How satisfied are you with your life, all things considered? Please answer according to the following scale: "0" means completely dissatisfied, "10" means completely satisfied*". The range of possible responses is defined over a scale that varies between datasets (one to four, one to seven, or one (or zero) to ten), with the lowest grades indicating a poor level of life satisfaction. According to Schwarz and Strack (1999), these subjective social indicators supplement measures of the objective standard of living, which have long dominated welfare research in social sciences.

The increase in the research on happiness has been accompanied by an intense evaluation of the subjective well-being measures (Diener, 1984). One of the defenses in favor of using happiness data comes from evidence that it has frequently shown to be correlated substantially with various objective physiological and medical criteria (Kahneman and Krueger, 2006). Cohen et al. (2003), for instance, monitored the symptoms of subjects that were exposed to a cold virus. Those who had reported a higher level of life satisfaction at baseline were less likely to come down with a cold and quicker to recover if they became sick. Reported subjective well-being have shown to be positively associated with the duration of the so-called *Duchenne* smile (Ekman et al., 1990), and measures of responses to stress such as heart rate and blood pressure (Shedler et al., 1993). Subjective well-being measures have also shown to be correlated with other subjective data. Diener (1984) shows that people who say they

[6] Among others, some of the scales found throughout the relevant literature are: The D-T Scale (delighted-terrible) which is widely used in psychological studies (Andrews and Whitey, 1976). This scale asks questions similar to this: Taking everything into consideration, how happy are you? Other scales such as the Self-Anchoring Ladder Scale created by Cantril and Fordyce's Scale (Diener et al., 1985) ask the individual to report what percentage of time he/she feels happy, unhappy or neutral.

are happy are independently rated by those around them as happy. Di Tella et al. (2003) comment on the previous findings that self-reported measures of well-being are also correlated with psychological responses and electrical readings in the brain. From a macro perspective, Di Tella et al. (2003) also mention other ways in which subjective well-being data have being validated. For example, they found that higher levels of national reported well-being are associated with lower national suicide rates. This evidence is also confirmed by Helliwell (2007), who finds a strong negative correlation between these two variables. More comprehensive reviews of the reliability and validity of happiness measures are presented by Diener (1984), Myers (1992), and Urry et al. (2004).

At an individual level, the answers about satisfaction display great variability among individuals. Within the same individual, variability is displayed depending on variables such as context, mood, and the timing of the survey. Despite that fact, some authors have found a remarkable similarity in the determinants across large samples of respondents, both across countries and over time (see e.g. Diener and Seligman, 2004; Frey and Stutzer, 2001; Graham and Felton, 2006). Holländer (2001) discusses the characteristics of subjective well-being measures as a valid construct and offers arguments in favor of the use of these measures in the economic analysis. He suggest that the fact that subjective well-being data enabled psychologists to identify circumstances that, on average, make a life satisfying for those who live it, should convince economists that it is worth the while to try the same for economic circumstances.

2.2. Quantitative Techniques in the Analysis of Subjective Well-Being.

2.2.1. The Ordered Response Model.

As an attitude, subjective well-being is a latent variable. This means that it is not observable, and one can only try to infer individuals' preferences from satisfaction answers. In practice, we assume that individuals do a subjective evaluation of their situation as a whole and express their own measure of satisfaction derived from the

maximization of their utility function. In summary, we assume that each individual makes an evaluation of his utility and classifies it under one of the categories to his disposition. For example, for the life satisfaction question in the German survey the answers range from 0 to 10, where 0 means completely unsatisfied and 10 completely satisfied. The aim is to model these answers as function of a set of explanatory variables.

Without loss of generality, we can denote the response of the individual i as SWB_i, which belongs to an ordered set $k = \{0,1, \dots ,10\}$. The most common way of modeling the choices consists of assuming that there exists a function of underlying utility SWB_i^* and 11 parameters ordered threshold $-\infty = \mu_0, \mu_1, \dots, \mu_k, \dots, \mu_{10} = +\infty$ such that the individual responds category k if and only if $SWB_i^* \in (\mu_{k-1},\ \mu_k]$, which is:

$$SWB_i = k \Leftrightarrow \mu_{k-1} < SWB_i^* \leq \mu_k$$

The empirical counterpart of the underlying function is assumed to be related linearly to observable and unobservable factors as:

$$SWB_i^* = x_i'\beta + \varepsilon_i \tag{1}$$

The probabilities of the observed outcomes are derived using the probabilities laws,

$$\begin{aligned} \Pr(SWB_i = k) &= \Pr(\mu_{k-1} < SWB_i^* \leq \mu_k) \\ &= \Pr(\mu_{k-1} < x_i'\beta + \varepsilon_i \leq \mu_k) \\ &= \Pr(\mu_{k-1} - x_i'\beta < \varepsilon_i \leq \mu_k - x_i'\beta) \\ &= \mathrm{F}(\mu_k - x_i'\beta) - \mathrm{F}(\mu_{k-1} - x_i'\beta) \end{aligned} \tag{2}$$

Where F is the cumulative distribution function (c.d.f) of ε_i. The regression parameters, β, and the $K-1$ threshold parameters, $\mu_0, \dots, \mu_{K-1}$ are obtained by maximizing the log likelihood function subject to $\mu_k > \mu_{k-1}$ for all k. Two standard cases are used in the literature (for references see Cameron and Trivedy, 2009; Greene, 2009); whether is assumed that ε_i has a normal distribution, then the ordered probit model emerges, whereas whether we assume that the distribution is a logistic

standardized, it is produced an ordered logit. For the present case it will assume that ε_i is normally distributed with $\mathrm{F(z)} = \Phi(\cdot)$, the standard normal c.d.f.

It is well known that the estimated coefficients from categorical and ordered models have a different interpretation than those from linear models derived from OLS method. In the ordered probit model that we use in the contributions in Chapter 5 and 7, the sign of the regression parameters β can be interpreted as determining whether satisfaction increase with the increasing in a given regressor. If β_m is positive, then an increase in the variable x_{mi} increase the probability of being in the highest category of satisfaction[7]. The marginal or partial effect on the probability of choosing alternative k when regressor x_m changes is given by:

$$MPE_{km}(x) = \frac{\partial \Pr\,(SWB_i=k)}{\partial x_{mi}} = [F'(\mu_{k-1} - x_i'\beta) - F'(\mu_k - x_i'\beta)]\beta_m \qquad (3)$$

Then, if one coefficient is twice as big as another, then so too is the size of the marginal effect. From the last expression it is easy to infer that the magnitude of these probability changes depends on the specific values of the covariates for the ith observation. However, as it is shown by Boes and Winkelmann (2006), a closer look to the $MPE_{km}(x)$ becomes apparent two restrictive properties of the marginal probability effects in standard response models, limiting their practice usefulness. First, the *relative* marginal probability effects are constant across individuals and the outcome distribution. From (3) it is possible to conclude that:

$$\frac{MPE_{km}(x)}{MPE_{kl}(x)} = \frac{\beta_m}{\beta_l}$$

which does not depend on i and k. As a second restriction, Boes and Winkelmann (2006) point out that the *single crossing property*, from the standard normal and the logistic density functions, precludes a flexible analysis of the marginal probability effects by design. The marginal probability effect in these models can change their sign only once when moving from the smallest to the largest outcome.

[7] However, the sign of the partial effects in intermediate categories is ambiguous, since the difference of the two densities can have either sign (Greene, 2009).

These ordered models present an additional complication associated to the interpretation of interaction terms. In Chapter 6 we use interaction terms, so we try to infer how the effect of one independent variable on the dependent variable depends on the magnitude of another independent variable. Norton et al. (2004) have shown that the interpretation of interaction terms that is used in linear regression models cannot be extended to nonlinear models as the one described above. The marginal effect of a change in the both interacted variables for this kind of models is not equal to the marginal effect of changing just the interaction term, even the sign may be different for different observations, and the statistical significance cannot be determined from the t statistic reported in the regression output.

Ferrer-i-Carbonell and Frijters (2004) and van Praag and Ferrer-i-Carbonell (2004) have shown that the results using ordered logit or probit models are surprisingly close to the result of a simple OLS. That is, the sign of the coefficients are the same; whether a coefficient is significant is the same; and the trade-offs between variables are roughly the same, which means that indifference curves are similar. Therefore, based on that previous evidence, for our analysis of Chapter 6 we shall estimate OLS models in order to have a clear interpretation of interaction terms.

2.2.2. Generalized Ordered Probit Model.

There is a richer class of parametric models that does not impose restrictions such as constant relative marginal effects or single crossing, which are presented in the standard response models. Among these Generalized Ordered Choice Models, Boes and Winkelmann (2006) and Greene (2009) present: the generalized thresholds model, random coefficients model, finite mixture model and sequential model. To the aims of the present work, it shall show the Generalized Ordered Probit Model formulated by Williams (2006), which follows the same ideas of the Heterogeneous Threshold Model proposed by Terza (1985). Even, Greene (2009) affirms that at this juncture, these two models from Williams (2006) and Terza (1985) are indistinguishable.

Among other studies, Pudney and Shields (2000), Boes and Winkelman (2006a), Greene, Harris, Hollingsworth and Matira (2008), Boes and Winkelman (2010), and Greene and Hensher (2010), all show cases where the heterogeneity more likely to be present in the data is that associated to the individual variation in the set of thresholds.

As Boes and Winkelmann (2006) expose, the form to generalize the threshold parameters is by making them dependent on covariates:

$$\mu_k = \tilde{\mu}_k + x_i'\gamma_k$$

where γ_k is a vector of response specific parameters. From the combination of this assumption and the probabilities presented in Equation 2, we obtain the probabilities in the generalized ordered model

$$\begin{aligned}\Pr(SWB_i = k) &= \mathrm{F}(\tilde{\mu}_k + x_i'\gamma_k - x_i'\beta) - \mathrm{F}(\tilde{\mu}_{k-1} + x_i'\gamma_{k-1} - x_i'\beta) \\ &= \mathrm{F}(\tilde{\mu}_k - x_i'\beta_k) - \mathrm{F}(\tilde{\mu}_{k-1} - x_i'\beta_{k-1})\end{aligned}$$

$$\text{for } k = 0,1,\dots,10 \qquad (4)$$

As in the standard ordered response model $\tilde{\mu}_0 = -\infty$ and $\tilde{\mu}_K = \infty$. In order to identify the same x_i entering in the index function and the generalized threshold in (4), β_k is defined as $\beta_k \equiv \beta - \gamma_k$. Under this definition of the probability density function, the parameters can be estimated directly by maximum likelihood. Notice that this generalized model nest the standard model under the restriction $\beta_1 = \cdots = \beta_{K-1}$ and therefore both models can be tested against each other.

The marginal probability effects from the generalized ordered model can be analyzed with more flexibility than in the standard ordered response model:

$$MPE_{kr}(x) = F'(\tilde{\mu}_{k-1} - x_i'\beta_{k-1})\beta_{(k-1)r} - F'(\tilde{\mu}_k - x_i'\beta_k)\beta_{kr}$$

Without doubt, this generalization comes at a cost and demands large samples. This generalized model now contains more parameters than before: $[(K-2) \times$ (# covariates)], which reduces the degrees of freedom, particularly when

K is large. Boes and Wilkenmann (2006) also list a second cost associated to these generalized models, which is that the condition $\tilde{\mu}_{k-1} - x_i'\beta_{k-1} < \tilde{\mu}_k - x_i'\beta_k$ is required for all observations to ensure a well-defined probability function, and attempted violations result in unproductive optimization steps when maximizing the likelihood.

In sum, although a generalized ordered response model offers a less restrictive framework and the possibility of more flexible analysis, it demands the use of rich datasets. For this reason, the empirical work doing in this research uses standard ordered probit models in the chapter dedicated to the analysis for Latin American Countries, where the available dataset is the Latinobarómetro survey. The standard and generalized ordered probit models are used in the last chapter where the German Socio-Economic Panel is available.

3. EMPIRICAL BACKGROUND.

3.1. Subjective Well-being Research.

Frey and Stutzer (2002) give some important reasons for economists to consider happiness research. First, happiness research can help to evaluate net effects, in terms of individual well-being, for different economic policies. Understanding the determinants of subjective well-being can thus usefully inform economic policy decisions. Second, this research also has relevance to economists because of the effect of institutional conditions such as the quality of governance and the size of social capital on individual well-being. It may also help to solve empirical puzzles that conventional economic theories find difficult to explain. For instance, using this approach it is possible to understand why for several countries since World War ll although they have raised their real income drastically, the self-reported subjective well-being of the population has not increased or has even slightly fallen.

The strategy is to use the answers that people give when asked questions about how happy they feel with life[8]. Similar questions are posed with respect to job

[8] This research can also be understood as an empirical approximation to experienced utility, a concept advocated in a seminal work by Kahneman et al. (1999). It argues, in essence, that measures of experienced utility (such as an overall view of one's satisfaction with life) can be used as reasonable substitutes to observing individual choices. In addition, the psychology literature has found significant validation in subjective well-being surveys, where

satisfaction, health satisfaction, housing satisfaction, satisfaction with marital relation, etc. This study of the different aspects of life is called domain satisfaction. Although this approach could have limitations, as was said by Oswald (1997), if the aim is to learn about what makes people tick, listening to what they say seems likely to be a natural first step. The domains-of-life literature states that life can be approached as a general construct of many specific domains, and that life satisfaction can be understood as a result from satisfaction in these domains of life (Cummins, 1996; van Praag et.al, 2003; Easterlin and Sawangfa, 2007; Rojas, 2006a, 2006b).

It is evident that different domains may be distinguished. In many studies, the domains to be analyzed are determined by data availability. For instance, in the British Household Panel Survey leisure satisfaction is split up into two sub-dimensions; namely, the amount of leisure and use of the leisure time; Latinobarómetro only includes satisfaction with the amount of leisure. Moreover, four additional domains are available in the British data set: satisfaction with health, with married life and with social life. Latinobarómetro includes a question on satisfaction with the neighborhood that is not included in the BHPS and in the German Socio Economic Panel Survey either.

Rojas (2006b and 2007), on the basis of factor analysis, identified seven domains of life: health, economic, job, family, friendship, personal and community. Using information from Mexico[9], he showed that satisfaction in the family domain is crucial for life satisfaction. Family satisfaction includes aspects of satisfaction with one's spouse, children and with the rest of the family. Rojas also showed that the satisfaction in the health, job and personal domains is also very important for a person's happiness. Satisfaction in areas such as housing and living conditions, financial solvency and income are relatively less important for life satisfaction. Rojas

individuals who report themselves as happy tend to smile more (Pavot et al., 1991); Diener (1984) shows that people who say they are happy are independently rated by those around them as happy; Di Tella et al. (2003) comment on the previous findings that self-reported measures of well-being are also correlated with psychological responses and electrical readings in the brain. From a macro perspective, those same authors mention other ways in which subjective well-being data have being validated; For example, they found that higher levels of national reported well-being are associated with lower national suicide rates. This evidence also was confirmed by Helliwell (2006a), who also found a strong negative correlation between these two variables.

[9] He used a database from a survey conducted in Mexico during 2001.

(2007) found that income is an explanatory variable of relevancy for economic and labor satisfaction, but not for family satisfaction or leisure satisfaction. For that reason, it is possible to find situations where a person is satisfied with her life while she is unsatisfied economically, or where a person is unsatisfied with her life and, at the same time, her economic satisfaction is high (Rojas, 2008).

3.2. The Correlates of Subjective Well-being.

3.2.1. Individual Characteristics.

Empirical research has focused on different factors associated with subjective well-being and satisfaction. In agreement with psychological and sociological studies (Argyle and Martin, 1991), economic research has identified a set of personal and social characteristics associated with life satisfaction. Most studies using data from North America and European countries have found the level of reported life satisfaction to be high among those who are married (Blanchflower and Oswald, 2004b; Easterlin, 2003; Carroll, 2007; Clark et al., 2005; Ferrer-i-Carbonell and Frijters, 2004), women (Oswald, 1997; Clark, 1997), whites (Oswald, 1997; Alesina et al., 2004), the self-employed (Blanchflower, 2000; Blanchflower, 2004; Frey and Benz, 2003; Alesina et al., 2004), the retired (Di Tella et al., 2003), and those occupied with home duties (Di Tella et al., 2003; Borooah, 2005).

The relationship between other individual characteristics and subjective well-being is less clear. One such example is education. While some studies have found that well-being is positively related to education (Blanchflower and Oswald, 2004a; Borooah, 2005; Frey and Stutzer, 2003), other studies have found the opposite (Clark and Oswald, 1996). The latter is associated to greater expectations from highly educated people. The relation between an individual's age and happiness also seems to be a bit complex. Many people believe that the quality of life deteriorates with age and that old people should be unhappier than young people since the old tend to have a worse health, less income, and few are married. Nevertheless, many studies have

surprisingly thought that old people report levels of happiness comparatively higher than young people, though this effect tends to be small. Frey and Stutzer (2001) have indicated four reasons that can explain this positive relationship between age and happiness: (i) the old have lower expectations and aspirations. For example, an elderly person waits to remain without work and possibly widower, so the effects of the loss will be lower on the old than on the young. (ii) They have little disparity between goals and achievements, since the elderly's goals are fixed closer to what reasonably they can reach. (iii) Older individuals have had more time to adjust to their life conditions, and (iv) old people have learned how to reduce the negative events of the life and how to regulate the negative affects. Besides, economists have identified a U-shape in the relationship between age and happiness (e.g. Oswald, 1997; Blanchflower and Oswald, 2004a). This implies a convex shape in the relationship of life satisfaction with age. Life satisfaction decreases with age until it reaches a minimum, increasing afterwards. For North America and European countries this minimum typically occurs in the forties (43 in Frey and Stutzer (2001) and Ferrer-i-Carbonell (2005); 46 in Peiro (2007)).

Health status is a factor that can be expected to be an important determinant of life satisfaction. In the 1950s the use of concepts such as *welfare*, *adjustment* and *mental health* had much in common with the traditional concept about *happiness* (Argyle, 1991). Research on the health-related quality of life was developed in the mid 1970s by health scientists and psychologists in order to track people's perception of their health status (Gough et al., 2007). This was mainly in response to the need for more sensitive measures to compare treatments for chronic illness and to identify the most cost-effective treatments[10]. Good health is considered an important factor included in the capabilities and the necessary functionalities in order for an individual to face life (Deaton, 2007; Sen, 1999). Since the 1980s the state of health has been identified as an important determinant of life satisfaction, as happy people are healthier, both physically and mentally (Veenhoven, 1991; Argyle, 1999).

[10] The relationship between health and well-being has measured people's perceptions of their health status through both subjective questions about satisfaction and emotions (Nord et al. 2001), and self-report objective questions about symptoms and functional status.

Consequently, poor health, which limits an individual's ability to carry out their daily activities, reduces overall satisfaction.

3.2.2. Individuals Income.

For different reasons can seems evident that higher income provides higher subjective well-being (Stutzer and Frey, 2010). People with higher income have more opportunities to attain whatever they desire; they can buy more material goods and services. In the empirical studies, as a robust and general result, it has been found that there is a positive and significant relationship between income and subjective well-being, both in simple regressions and when a large number of other factors are controlled for in multiple regressions in cross-sectional analysis (for a review see Clark et al, 2008). This holds for both developed (Argyle, 1999; Blanchflower and Oswald, 2004a; Frey and Stutzer, 2001, 2002) and less developed countries (Graham and Pettinato 2002; Lelkes, 2006).

However, if the relationship between income and subjective well-being is studied from a different perspective, and we ask whether an increase in income over time raises reported subjective well-being, the answer can seems curious or even astonishing. There is evidence that people in industrialized countries are not becoming happier over time, despite economic growth. Early support of this fact was observed by Easterlin (1974, 1995), who set out the now famous paradox where the substantial real income growth in Western countries over the last fifty is not accompanied by any corresponding rise in reported the average self-reported well-being levels. Clark et al. (2008), using the General Social Survey, show that for the United States over the period 1973-2004 the real per capita income goes up to the double while reported happiness shows no trend. Similar evidence has been found also for Japan by Easterlin (1995), and for some European countries.

The broad consensus in the literature is that if a general increase in national wealth does not make inhabitants of a country happier, it is because adaptation (Easterlin, 2005) and/or because individuals only value the relative progress in their

personal income, compared to some relevant reference group. Thus, individuals notice and react to deviations from reference levels.

3.2.3. Comparisons Influences.

Aspirations and comparisons effects also are important in relation with income and other factors affecting subjective well-being. The individual's reported subjective well-being in the present is based on a norm of what is *bad*, *sufficient* or *good*. Such norms not only depend on the present situation, but also on what the individual has experienced in the past, on what she expects to experience in the future and on what other people think and do (van Praag and Ferrer-i-Carbonell, 2004). In relation with income, individual well-being does not only depend on income in absolute terms but also on the subjective perception of whether one's income is adequate to satisfy one's needs. In addition, individual income perception is subject to the individual's own situation, past and present, as well as to the income of other people. The latter reflects the importance of the relative position of individuals in society for their satisfaction with life. This is often referred to as the *comparison income* or *relative utility* effect[11].

It is often argued that individuals adapt to new situations by changing their expectations (Easterlin, 2005; Clark et al., 2008). This implies that higher incomes are accompanied by rising expectations that lead to what is known as the *hedonic treadmill* (Brickman and Campbell, 1971) or *hedonic adaptation* (Frederick and Loewenstein, 1999). Thus, individuals strive for high incomes even if these lead only to a temporary or small increase in well-being. This ability to adapt would appear to be a ubiquitous feature of the human condition. Some recent examples of adaptation in nonmonetary spheres are Lucas et al. (2003) and Lucas (2005) with respect to marriage and divorce, Wu (2001) and Oswald and Powdthavee (2006) for adaptation to illness or disability, and Lucas et al. (2004) regarding unemployment.

[11] According to Easterlin (1995, p. 36): "... happiness, or subjective well-being, varies directly with one's own income and inversely with the incomes of others". The *others* constitute what is known as the reference group.

The comparisons with different social reference groups are also an important factor that has been widely present in the analysis of two dimensions; namely, the analysis of the effect of relative income on financial satisfaction and/or satisfaction with life as a whole (McBride, 2001; Stutzer, 2004; Luttmer, 2005; Clark et al., 2008) and the influence of unemployment on subjective well-being. A standard result in happiness literature is that the unemployed report significantly lowers levels of subjective well-being than other labor force groups (Winkelman and Winkelman, 1998; Frey and Stutzer, 2002). Indeed, the pecuniary and the non-pecuniary costs of the unemployment are that high that adaptation is non-existent (Lucas et al., 2004) or only very moderate (Clark, 2002). Clark (2003) uses seven waves of the British Household Panel Survey to test for social norms in labor market status. In his analysis, he found that the well-being of the unemployed is the higher, the higher the unemployment rate in a reference group (at the regional, partner, or household level). It seems that, the more unemployment becomes the norm, the fewer individuals are affected by it (Winkelman, 2009). Lalive and Stutzer (2004), using a different strategy, obtain the same results for information from Sweden.

3.2.4. Social Relationships.

Social interactions could be either a negative or a positive factor. As previously mentioned, an individual's happiness depends on that individual's own relative (or positional) situation or status, and comparison with others, what would expose that individual to negative externalities in terms of peer-effects (Luttmer, 2005) in utility and/or consumption. Alpizar et al (2005) show that positionality matters far more for commodities as houses and cars than for vacation and insurance, but also that both absolute and relative consumption matter for each category, these are *positional goods*. The positive influence of social interactions may come from social relationships and other *relational goods*[12] or social capital factors.

[12] Relational goods are generated by social interactions (Gui and Sugden, 2005; Bruni and Stanca, 2008). Bechetti et al. (2008) include in the definition of relational goods: companionship, emotional support, social approval, solidarity, a sense of belonging and of experiencing one's history, the desire to be loved or recognized by others etc. The authors, and others researchers affirm that these goods are, on a smaller scale, produced by family

For instance, Rojas (2007), Winkelman (2009), Argyle (1999), among other social scientists have found that social relationships are a major source of well-being. Argyle (1999) refers some studies where it was found that if all kinds of social support are combined, a social support factor is found to have a strong correlation of 0.50 with happiness. Social scientists in many countries have observed that social support or social networks (and the associated norms of reciprocity and trust) have powerful effects on the level and efficiency of production and well-being, broadly defined, and they have used the term *social capital* to refer to these effects (Coleman, 1988; Putnam, 2000; Woolcock and Narayan, 2000).

Therefore, in addition to the variables associated with the individual's relationships with friends and relatives, we include other variables that frequently are used as proxies to the concept of *social capital* and are closer to different kinds of social support, such as church membership and, memberships in other types of associations and trust (all thought to be indirect manifestations of social capital). Although, psychologies had long ago identified that social support is an important determinant of happiness[13], economists have only recently included social capital variables in their analysis and have confirmed that social capital is strongly linked to subjective well-being through many independent channels and in several different forms (Helliwell and Putnam, 2004; Helliwell, 2001 and 2006).

Lately, some cross-sectional studies from both sociology and economics have shown the importance of key aspects of social capital – such as trust, social contacts and membership in voluntary associations – over individual well-being (Inglehart 1999; Putnam 2000; Helliwell 2003 and 2006; Powdthavee, 2008). In Bowling Alone, Putnam (2000) suggested that people prosper in neighborhoods and societies where social capital is high, that is, where people trust one another and are mutually helpful. Putnam reviewed evidence showing that communities with high rates of volunteer activity, club membership, church membership, and social entertaining (all thought to

relationships or friendships and, on a larger scale, in many kinds of social events (club or association meetings, live sport events, etc.)

[13] Berkman and Syme (1979, cited by Argyle, 1999) followed up seven thousand people over nine years and found that more of those with stronger support networks were still alive at the end of the study.

be indirect manifestations of social capital) all had higher well-being than communities that were impoverish these characteristics. Many studies that use cross-sectional data have shown that individuals with rich networks of active social relationships, that do not include people living in the same household, tend to be happier with their lives (Phillips 1967; Burt 1987). Helliwell (2003) reported that well-being is high and suicide rates are low where trust in others is high, and he also found that well-being is high where memberships in organizations outside of work are at high levels. Thus, there is evidence that individuals are more likely to experience high well-being when they live in nations with high social capital than when they live in nations with low social capital, a finding that dovetails with the results of studies on individuals' social interactions. Helliwell and Putnam (2004) and Powdthavee (2008) are comprehensive reviews about the importance of social capital factor over subjective well-being.

3.3. Previous Evidence from Latin American Countries.

The literature about subjective well-being in Latin American countries is few and very recent. Graham and Pettinato (2001) were some of the first to analyze Latin American countries. Using the Latinobarómetro 2000, they found that Latin America is not all that different from the advanced industrial economies in relation to some of the determinants of happiness. Similar to the OECD countries, happiness has a quadratic relationship with age, initially decreasing and then increasing monotonically after 49 years of age. As in the industrial countries, being married had positive and significant effects. In contrast to the advanced economies, a significant gender effect was no found in Latin America. Also, as in the industrialized countries, the coefficients for level of wealth were strong, positive, and significant in happiness. When wealth was included in the regressions, the coefficient for education level became insignificant or weakly significant, depending on the regression used. Being self-employed or unemployed both had significant and negative effects on happiness. When they included country-fixed effects, the coefficient on self-employment became

insignificant. While being unemployed also has negative effects on happiness in the advanced industrial economies, being self-employed has positive effects. The most credible explanation is intuitive and it was given by the authors: most self-employed people in the latter are self-employed by choice, while in developing economies, many are self-employed due to the absence of more secure employment opportunities and live a precarious existence in the informal sector.

Using data from the Gallup World Survey 2007 and complementary information provided by other institutions in different countries, the Inter-American Development Bank – IDB analyzed the quality of life in Latin American and Caribbean countries (Lora, 2008). Among the most outstanding findings by the Lora's (2008) study was that people's perceptions are often in stark contrast to reality. Opinions in some countries are too optimistic and in others too pessimistic. For instance, the study affirms that Guatemala and Venezuela have inflated opinions considering their objective conditions of human development while people in Argentina, Chile, Peru and Trinidad and Tobago see their own achievements short. Although people with higher socio-economic conditions see all aspects of their lives in a better light than those with lower socioeconomic conditions, when they evaluate their living conditions and government policy, the poor report a similar opinion to – or even a more positive opinion than – the rich. The poorest and least educated groups of the population have a better opinion of social policies, such as education, health services and social protection, than the richer or better educated individuals in the same countries. This contrast between perception and reality is also evident in the labor dimension. Even with the proliferation of low-skill jobs and informal employment, Lora (2008) shows that most Latin Americans are satisfied with their work, and that there is a generalized preference to work in the informal economy over the formal, salaried sector. The author concludes that this preference on the informal economy could be due to flexibility, autonomy, and opportunity for personal growth that informality seems to offer.

Other analyses by countries have been conducted in Latin America. Among the most important, Rojas (2006b and 2007), using the domains-of-life approach in

Mexico, found that people are on average, more satisfied in the family domain, while they are less satisfied in the consumption, personal and job domains. Rojas (2007) found that income is an explanatory variable of relevancy for the economic and labor satisfaction, but not for either family or leisure satisfaction. Due to that, he found a weak relationship between income and life satisfaction Gerstenbluth et al. (2007) studied the relationship between happiness and health in Argentina and Uruguay using the Latinobarómetro 2004. Cruz and Torres (2006), using the Encuesta de Calidad de Vida 2003, tested various happiness hypotheses among Colombians and Cid et al. (2008), using the survey called Salud, Bienestar y Envejecimiento en América Latina y el Caribe (SABE), explored the correlation between happiness and income in the elderly in Uruguay. To our knowledge, the previous studies conducted about Latin America have not included the effect of social capital on subjective well-being, and they have analyzed the self-employment as a homogeneous labor market status.

4. DATA SOURCES.

4.1. Latinobarómetro.

Two of the contributions of this document use the annual survey provided by the Latinobarómetro[14] organization for the year 2007. Latinobarómetro is an annual public opinion survey. It is not a longitudinal survey; this survey does not interview the same people every year, so we cannot examine the effect of changing in personal or environment conditions over individual subjective well-being. The surveys are conducted annually by a prestigious research firm in each country. The Latinobarómetro release 2007 consists of 20.212 observations whit approximately 1000 - 1200 interviews in each of eighteen countries in Latin America (Latinobarómetro 2007a, 2007b).

The countries and the number of respondents by country included in the 2007 Latinobarómetro survey are shown in Table 4.1.

[14] Latinobarómetro Corporation is a private non-profit organization based in Santiago, Chile, and is solely responsible for the production and publication of the data. http://www.latinobarometro.org

Table 4.1. **Respondents by Country in the Latinobarómetro 2007.**

Country	Number of Interviews
Argentina	1200
Bolivia	1200
Brazil	1204
Chile	1200
Colombia	1200
Costa Rica	1000
Dominican Republic	1000
Ecuador	1200
El Salvador	1000
Guatemala	1000
Honduras	1000
México	1200
Nicaragua	1000
Panamá	1008
Paraguay	1200
Peru	1200
Uruguay	1200
Venezuela	1200
Total respondents in the Latinobarómetro	20212

The field work of the survey took place between September 7 and October 9, 2007 in the countries listed in Table 4.1. The samples are representative[15] of the adult population of each country with a margin of error of approximately 3% for each country. With the exception of five countries, the representativeness is 100%. The exceptions are for Guatemala 96%, Honduras 98.4%, Nicaragua 99.8%, Panama 99.2% and Paraguay 97.4% (Latinobarómetro, 2009). In all countries, adulthood begins at 18 except in Brazil and Nicaragua where it is 16.

A four-stage modified probabilities sample, with quotas in the final stage, was the methodology used in Argentina, Bolivia, Brazil, Costa Rica, Ecuador, El Salvador, Guatemala, Honduras, Nicaragua, Dominican Republic and Peru. The methodology used in Chile was a three-stage probabilistic sample; in Colombia and Paraguay was used a five-stage modified probabilistic sample in urban areas and four stage in rural areas, with quotas in final stage; in México a three-stage modified probabilistic

[15] Only since the year 2006 are all the surveys nationally representative. The surveys of Argentina, Bolivia, Brazil, Colombia, Chile, Paraguay, and Peru had an urban bias, especially before 2002.

sample, with quotas in final stage, and in Venezuela a seven-stage modified probabilistic sample, also with quotas in final stage. The Methodological Report Latinobarómetro 2007 (Latinobarómetro, 2009) describes in detail the methodology used in each country.

With the exception of Bolivia, Brazil, Costa Rica, Ecuador, Mexico, Panama, Peru and Uruguay, in each country the sample is weighting with respect to sex, age and other criteria. In Dominican Republic, El Salvador, Guatemala, Honduras and Nicaragua the sample is weighted with respect to stratum; in Chile is weighted with respect to age, sex, educational level and geographical area; in Argentina with respect to sex and age; in Colombia with respect to age, sex, educational level and size habitat; in Paraguay with respect to type of area and, in Venezuela is weighted with respect to sex and educational level. More details also are provided by the Methodological Report (Latinobarómetro, 2009). Given that, we use the weights in our estimations.

4.2. The German Socio-Economic Panel – GSOEP.

The German Socio-Economic Panel Study (SOEP, for Sozio-oekonomisches Panel) is a wide-ranging representative longitudinal study of private households. The annual surveys are conducted by the German Institute for Economic Research, DIW Berlin (Deutsches Institut fur Wirtschaftsforschung). The fieldwork organization TNS Infratest Sozialforschung sampled every year nearly 11000 households, and more than 20000 persons. Some of the many topics surveyed include household composition, occupation, employment, earnings, health and life satisfaction indicators.

The data provide information on all household members, consisting of Germans living in the old and new German States, foreigners and recent immigrants to Germany. Depending on the year they started to be included in the survey and some key characteristics, the population samples are labeled from A to G (for a description of that samples see Haisken-DeNew and Frick, 2005). The annual panel

survey was initiated in 1984, first in the Federal Republic of Germany (West Germany) with just under 6000 households at the time. After June 1990, East German households were included in the GSOEP extending the sample. To counter the adverse effect of panel attrition on the sample sizes, supplementary booster samples were added in 1994/95 (about 500 immigrant households), 1998 (about 1100 households) and 2000 (about 5000 households). To tackle another major shortcoming of many surveys – insufficient small numbers of respondents with high incomes – subsample of high-income households was started in 2002, and a new refreshment sample covering all the existing subsamples were added in 2006. Table 4.2 summarizes that information.

Table 4.2. Starting Sample Size in Wave 1 (full 100% sample) GSOEP.

Sample	Starting Year	Households	Respondents
A and B	1984	5921	12245
C	1990	2179	4453
D1 / D2	1995	522	1078
E	1998	1067	1923
F	2000	6052	10890
G	2002	1224	2671
H	2006	1506	2616

At current, the GSOEP interviews approximately 25000 individuals aged lying in more than 12000 households annually (Wagner et al., 2007). All samples of GSOEP are multi-stage random samples which are regionally clustered. The respondents (households) are selected by random-walk. For further details, see Haisken-DeNew and Frick (2005)

An extensive documentation of SOEP-data is available via the German Institute of Economic Research homepage (www.diw.de/soep) including the Desktop Companion DTC, a detailed description of the set-up of the biographical information and various introductory papers for using prominent statistical software packages with SOEP. The most important of these is SOEPinfo, a web-based information system that allows users to identify information at the variable level (including frequencies

and an item's correspondence across time) and gives support in setting up data retrievals for generating rectangular analysis files from the underlying SOEP micro-data files.

5. HETEROGENEOUS SELF-EMPLOYMENT AND WELL-BEING IN LATIN AMERICAN COUNTRIES: ARE ALL THE SELF-EMPLOYED UNHAPPY?

5.1. Introduction.

According to statistics from the International Labor Office, while self-employed individuals represent around 10 percent of the working population in developed economies[16], in Latin American and Caribbean (Latin American hereinafter) countries they represent a third[17] of the population in the labour force (LABORSTA, 2011; CEDLAS and The World Bank, 2011). The usual distinction between self-employed and employed individuals is that the former ones are not subject to a hierarchy (they are their own bosses) Although that description of self-employment applies in developed and less developed countries, it is also recognized that the self-employed are exposed to higher income volatility than wage earners (Shore, 2011). In Latin American countries self-employment occupations are typically associated to *informal* employment that goes unreported, leaving the individual unprotected and vulnerable. As entrepreneurs, self-employed enjoy a large degree of independence and self-

[16] For instance, 7% in the United States, 11% in Spain, 6% in France, 9% in Belgium, 7% in Austria, 13% in the United Kingdom, etc.

[17] This rate ranges from 43.3% in Dominican Republic and 41.2% in Colombia or Paraguay, to 25.1% in Costa Rica and 22.4% in Argentina.

determination at work. However, one should also take into account that entrepreneurship is potentially linked to a higher risk assumption and higher income volatility.

Apart from the features of independence and absence of hierarchy, risk and instability are also characteristics of self-employment. In developing countries, this type of employment is depicted by some authors (Harris and Todaro, 1970) as a synonym of involuntary underemployment or disguised unemployment, situating it in the context of dualism with the formal labor market[18]. Some other authors challenge this view, by arguing that informal employment in less developed countries is a voluntary choice, analogue of the voluntary entrepreneurial small-firm sector found in industrialized countries (Maloney, 2004). These two contested characterization are of particular relevance to Latin American countries, because the description of the individual's labor situation as a *voluntary* or *involuntary* option can have important policy implications. As Kucera and Roncolato (2008) argue, while the higher the ratio of voluntary to involuntary informal employment is: (i) the less meaningful is informal employment as an indicator of underdevelopment; (ii) the more meaningful is the open unemployment rate as an indicator of labour market slack; and (iii) the more contradictory may be the policies aiming to increase formal employments.

Under the assumption of self-employment as a voluntary choice, the vulnerability and risk associated to these job types becomes not so important. Fields (1990), for instance, links self-employed with workers who had previously worked in paid jobs and, where they gained the skills and savings to set up their own enterprises. Under this view, individuals chose voluntarily being their own bosses. However, for those individuals who prefer a secured and safe job and cannot find it, self-employment appears as an option to unemployment, which can see as involuntary.

[18] Bosch et al. (2007) argue that in this dominant perspective, the informal sector is perceived as the disadvantaged sector of a market segmented by rigidities in the formal or covered sector of the economy. From this traditional view (Harris and Todaro, 1970), the well-paid, secured and safe jobs are found in the formal sector, while the informal works are to a small-scale, not legal, with low productivity and low wages.

Then, the risk and instability effect may dominate the positive one of freedom of choice.

To understand individuals' preferences about employment, in particular the choice between self-employment and employment, the traditional approaches to labor market indicators do not seem to be enough (Lugo, 2007). In this line, there have been several proposals of alternative indicators of employment characteristics in the literature. Some examples are presented by van der Hulst (2003), who finds that long working hours are associated with subjective fatigue and other subjective reported physical health problems. Andersson (2008) studies individuals' perceptions about life and job satisfaction as measures of subjective well-being, self-assessed general health, and whether the job is mentally straining and stressful. We will also focus our interest on the subjective indicators to describe individual preferences about self-employment. Specifically, we analyze the relationship between subjective well-being and workforce status.

For developed countries, related literature has shown the importance of the subjective approach (self-assessed satisfaction information) to understand individual's behavior in terms of employment status (Andersson, 2008; Clark, 2005; D'Addio et al., 2007; van Praag and Ferrer-i-Carbonell, 2004) and to predict labor market mobility (Clark et al., 1998; Clark, 2001). Those authors assume that rational individuals maximize their subjective well-being and, therefore, they avoid any state / personal condition in which they can suffer a low level of satisfaction (see for instance Clark (2001) and Lévy-Garboua et al. (2007) in the case of job quits, and Guven et al. (2010) for marriages dissolution).

Regarding employment status, previous evidence shows that unemployed individuals are substantially less satisfied with their life than workers, even when other characteristics, such as lower income, are controlled for (Clark et al., 2001; Winkelmann and Winkelmann, 1998). This finding applies not only for developed economies (Di Tella et al., 2001; Frey and Stutzer, 2002) but also for developing economies (Graham and Pettinato, 2001).

Concerning the distinction between employment and self-employment, Blanchflower (2000), using data from the USA, the UK, and Germany, finds that most of the respondents affirm that they would like to be self-employed if they could. If self-assessed well-being reflects a worker's experienced or post-decisional preference for her job relative to outside opportunities, as proposed by Lévy-Garboua and Montmarquette (2004) then, self-employed workers should report a higher subjective well-being. The allied evidence for developed economies shows that self-employed individuals report higher levels of satisfaction (in terms of their jobs and lives) than wage earners (Blanchflower and Freeman, 1997; Blanchflower et al., 2001; Taylor, 2004), as the rational maximization approach predicts.

Some other studies go further by asking the reasons why self-employed individuals report higher subjective well-being than employed (Benz and Frey, 2008a; 2008b; Frey et al., 2004; Hundley, 2001). An analysis of the compensating wage differentials shows that self-employment does not pay (Hamilton, 2000), suggesting that it provides non-monetary benefits. Benz and Frey (2004; 2008a; 2008b) show that, in western countries, the value of autonomy essentially explains the whole job satisfaction differential between self-employed and employed people, supporting the idea of procedural preferences for independence and the absence of hierarchy[19]. This positive effect of self-employment, however, does not seem to be homogeneous. For instance, using USA and European data, Alesina et al. (2004) find that the positive influence of self-employment on subjective well-being is limited to the *rich*, defined as those in the top two income quartiles. Fuchs-Schündeln (2009), using data for Germany, finds that those procedural preferences for independence are heterogeneous across the population, because not all self-employed experience an increase in job satisfaction to the same degree. In her study, she shows that those who are likely to value independence, the so-called *independent* types, experience a large increase in job satisfaction from being self-employed, while the most *hierarchical* types could even experience a decrease.

[19] Autonomy emerges as an important non-pecuniary benefit of self-employment, and it is appreciated because it is associated with the possibility of working independently.

As pointed out before, for the case of Latin American countries, we cannot only consider that dimension of independence or absence of hierarchy to evaluate the influence of self-employment in subjective well-being. Given the high rate of informality[20] and the relative importance of the self-employed in the labor market of Latin American countries, we should also consider the feature of risk and instability behind the self-employment or informal employment to study the link between individual's labor market status and subjective well-being in this region. Prior evidence from developed economies has shown the negative impact of job insecurity on psychological (Burchell et al., 2002) and subjective well-being (Clark et al., 2010). Consequently, the matter that self-employed workers can be exposed to economic insecurity, not protected by labour regulations and excluded from state benefits (Perry et al., 2007), can be considered as joined characteristics that, among others, can lead together to a negative effect of self-employment on subjective well-being.

While there are studies documenting and describing the labor market in Latin America using objective indicators, such as wages or hours of work (Gasparini and Tornarolli, 2007; Maloney, 2004; Tokman, 2009), only some research has been done to analyze labor force status as a determinant of individual's subjective well-being with dissimilar results. By distinguishing between employed, self-employed and other non active labor status, Graham and Pettinato (2001), and Graham and Felton (2005; 2006) were some of the first who analyzed subjective well-being in Latin American countries. Using data derived from the Latinobarómetro 2000 and 2004, they found that the most outstanding difference between the industrialized countries and Latin America is that in the USA and Europe, individuals classified as self-employed are happier on average than the employed, while in Latin America they are in average less happy than the employed. In compliance with their findings, these authors argue that workers in the self-employment sector chose this labor option due to the absence of more secure employment opportunities and live a precarious existence in the informal

[20] Tokman (2009) using data about urban areas of sixteen countries from Latin America find that the informal economy expanded from 57% to 63.3% of urban employment between 1990 and 2005 as a result of increases in the informal sector and of the number of precarious workers in formal enterprises.

sector[21]. This view provides an alternative effect to explain the influence of self-employment on well-being, apart from the procedural utility effect from independence at work or absence of hierarchy as proposed for developed countries by Benz and Frey (2008a; 2008b).

A more recent study by the Inter-American Development Bank (IDB), using data from the Gallup World Survey for the release 2007, and complementary information provided by other institutions in different countries, analyzes the quality of life in Latin American and Caribbean countries (Lora, 2008). Among their findings, they highlight that in Latin American countries people's perceptions are often in stark contrast to reality, and this contrast between perception and reality is evident in the labor dimension as well. Although the proliferation of low-skill jobs and informal employment, most Latin Americans are satisfied with their work. Comparing between informal and formal workers, there is a generalized preference to work in the informal economy over the formal, salaried sector. This preference on the informal economy could be due to the flexibility, autonomy, and opportunity for personal growth that informality seems to offer.

The apparent divergence in the results from those studies comes from the fact that they are assuming different categories and types of jobs. Lora (2008) points out the difference between formal and informal works, while Graham and Pettinato (2001) and Graham and Felton (2005, 2006) use the employment - self-employment classification. In Lora (2008) the informal status[22] is defined as salaried workers in small firms (including micro firm owners), nonprofessional self-employed and zero-

[21] There is not a clear definition about the informal sector, but frequently informal employment is defined as the non-coverage by social protection, and obviously individuals in informal employment do not have any labor or economic security.

[22] Although, informality is considered as an important topic to be included in the academic and politic debates, given, among other things, the strong link between informality, poverty and underemployment, the term *informality* is not clear from a theoretical point of view, and it is difficult to implement empirically. In principle, informal employment refers to employment that goes unreported, and thus, leaves the worker unprotected and vulnerable. However, some experts have argued that the definition should, instead, focus on the overall working conditions of workers and includes distinctions between jobs in terms of the size of the firm and/or the type of occupation (e.g. employees vs. self-employed), economic sector, among others. For a review about some of the most used criteria to define informality see Gërxhani (2004).

income workers. Graham and Pettinato (2001) and Graham and Felton (2005) just make distinction between salaried workers, self-employed and non active individuals. Without doubt, these definitions of informal employment and self-employment in the previous studies for Latin American countries pose some research difficulties, given that they both group occupation types with heterogeneous characteristics. For instance, while the first definition based upon regulation coverage does not necessarily imply that all the jobs under this category *informal* are of low quality (in terms of working conditions, wages, training opportunities, etc.), the second one based upon type of occupation (employed - self-employed). In particular, in Graham and Pettinato (2001) the category self-employment includes micro firm owners and self-employed professionals, as well as farming, fishing, forestry workers and street vendors.

In both cases, *informality* and *self-employment* are too broad categories to be conclusive. To try to reconcile those apparently contradictory previous findings about labor force and subjective well-being in Latin America, we propose a classification of self-employment as a heterogeneous workforce status[23] including diverse occupational categories, where those categories are featured in different intensity for the effects described above, the preference for independence or absence of hierarchy, and the existence of risk and instability. Hence, we use the arrangement of self-employment in the Latinobarómetro dataset 2007, which allows us to identify four different occupation types: professional, business owner, farmer-fisherman, and *ambulante*[24] own account workers. Our contribution is therefore, to test whether holders of different self-employment occupations have a different influence on their

[23] Although, we also have described that different occupations classified as *informal* influence individuals' well-being in different ways, we do not explore this possibility due to data constraints. For instance, the Latinobarómetro survey does not contain information about the size of the firm the individual works in and it does not offer information about workers employed in unpaid jobs, owners of enterprises, domestic help and workers in small firms with benefits. However, there is recent evidence in favor of our hypothesis from some developing countries. Pagés and Madrigal (2008) find substantial differences in job satisfaction within different types of informal jobs in Honduras, Guatemala and El Salvador

[24] This category groups workers making street services elementary occupations, such as street vendors, shoe-shiners, window-cleaners, etc.

well-being compared with individuals in paid employments. To this end, we consider subjective well-being in two dimensions, job and life satisfaction.

Our findings show the importance of analyzing, at least in Latin American countries, self-employment as a heterogeneous labor market status. In relation with individual subjective well-being, the main finding is that not all self-employed individuals are less satisfied than the employed ones, as predicted by some of the related literature. Our evidences show that: first, the precarious self-employed workers are less satisfied with their life and job than the employed; secondly, the average life satisfaction of the self-employed professionals and business owners[25] is not statistically different to that of the employed; and finally, the business owners are more satisfied with their jobs than workers in paid employments. The intuition is that in those occupations where self-employed reports either higher or equal subjective well-being as wage earners, the effect of risk and instability dominates the effect of independence and absence of hierarchy.

The remainder of this chapter proceeds as follows. In the next section, we review important hypotheses with reference to the determinants of individual subjective well-being. The data and the variables used in the study are described in the subsequent part. We proceed to explain the method of analysis. Then, the results from our analysis are presented and discussed. The final section concludes.

5.2. Hypotheses.

As pointed out in the introduction, our main goal is to incorporate the heterogeneity of self-employment occupations to determine the effect of being self-employed on individual subjective well-being. To be consistent with previous literature (see Chapter 3), we also add other factors that can influence the individual's well being, that is, we

[25] We have to be careful with these results because they are driven by the fact that the category *business* owner in the Latinobarómetro survey does not distinguish between micro-entrepreneurs and owners of larger businesses.

include the effect of individual resources and other socioeconomic characteristics. In line with related studies, we assume that a standard well-being function (or indirect utility function) can be written as follows:

$$SWB_i = SWB(y_i, LMS_i; X_i)$$

where y_i represents individual i's resources, LMS_i measures the individual i labor market status; and X_i is a set of socio-economic characteristics that has been previously identified in the literature as usual correlates of individual self-assessed well-being. Here, we present some hypotheses derived from the related literature that shall be tested in this chapter. The contribution of this work is not the hypotheses in themselves, but the way in which we test those hypotheses, in particular the ones related with labour market status. Considering the possibility that holders of different self-employment types have fundamentally different subjective well-being can shed light about not conclusive previous results from Latin American countries.

- *Resources Hypothesis*: This hypothesis assumes that individual's subjective well-being is influenced by the individual's economic status or material circumstances in a positive way. In related literature the economic status is usually modeled by income (Blanchflower and Oswald, 2004a; Ferrer-i-Carbonell, 2005), expenditure (Bookwalter and Dalenberg, 2010), or wages (Tao and Chiu, 2009), and less frequently by indexes of wealth (Graham and Pettinato, 2001; Graham and Felton, 2005; 2006). See Chapter 3 for a detailed summary of related literature on this hypothesis.

- *Labor Market Hypothesis*: This hypothesis relies on the individual's employment status. On the one hand, when the categorization considers only between being employed or self-employed, the evidence for developed countries shows that those workers that are self-employed report higher subjective well-being (in terms of life and job satisfaction) than wage earners (Blanchflower, 2000; Blanchflower and Freeman, 1997; Blanchflower et al., 2001; Taylor, 2004). In Latin American countries the distinction between

formal and informal employees shows a preference for informal occupations over the formal salaried work (Lora, 2008). The intuition to explain the findings in developed economies is that the greater subjective well-being of the self-employed is due to procedural preferences for independence and the absence of hierarchy (Benz and Frey, 2008a; 2008b; Frey et al., 2004; Hundley, 2001). On the other hand, self-employed workers could be exposed to economic insecurity, not protected by labour regulations and excluded from state benefits (Perry et al., 2007), leading to a negative effect on subjective well-being. For Latin American countries, Graham and Pettinato (2001) and Graham and Felton (2005; 2006) found that self-employed individuals report less life-satisfaction than those in paid employments. Although, negative or positive effect of self-employment on subjective well-being might reflect a multitude of characteristic that distinguish self-employed individuals from those who are in a paid employed, we hypothesize that, after controlling for other characteristics, the disaggregation of self-employment occupations could allow us to expect a positive (negative) sign in the case of those occupations where preference for independence or absence of hierarchy (risk and instability) dominates.

- *Socio-economic Hypotheses:* Based on the evidence from developed countries, being female is associated to larger levels of subjective well-being (see Alesina et al., (2004) for life satisfaction, and Clark (1997) and van Praag et al. (2003) for job satisfaction). There is evidence about a convex shape in the relationship of subjective well-being with age. See Oswald (1997) and Blanchflower and Oswald (2004a) for some evidence in terms of life satisfaction and van Praag et al. (2003) about job satisfaction in relation to age. With respect to marital status, although there is some variation across studies, it seems that, with respect to be single, being married has a positive effect on life satisfaction (Blanchflower and Oswald, 2004b; van Praag and Ferrer-i-Carbonell, 2004), and being separated, divorced or widowed is associated with the lowest level of satisfaction (Helliwell, 2003). Although in low income countries (and in early

studies for OECD countries) the relationship between each additional level of education and subjective well-being is positive, recent findings show a no clear effect. It seems that expectations of highly educated individuals make them report lower levels of satisfaction with life (Clark, 2003; Meier and Stutzer, 2008) and with job (Clark, 1997; Cornelißen, 2009). Race and ethnicity provide basis for identity and previous literature have argued that identity could affect individual's behavior and aspirations (e.g. Akerlof and Kranton, 2000). Research for European countries and the USA have found differences between blacks and whites' satisfaction with life (Blanchflower and Oswald, 2004a). There is some evidence across a range of geographical locations – Hudson (2006) for Europe; Dockery (2003) for Australia; Gerdtham and Johannesson (2001) for Sweden – that living in large cities is detrimental to life satisfaction. In all these socio-economic characteristics we do not have reasons to expect different effect effects for the Latin American case.

5.3. Data and Variables.

5.3.1. Data.

The empirical analysis is based on a representative survey in eighteen Latin American and Caribbean countries, which was designed and collected by the Latinobarómetro organization 2007 (Latinobarómetro, 2007a; 2007b; 2009). In addition to the standard demographic and socio-economic variables already presented in the Latinobarómetro data set, the survey from the year 2007 includes information about individuals' life and job satisfaction. More detailed description of this data set is presented in Chapter 4.

To reach our goal of checking the effect of heterogeneous self-employment situations on subjective well-being, we only consider those individuals who are active in the workforce. This leaves us with a sample that contains information from 11526 individuals. Moreover, we exclude from the analysis those individuals for whom we

lack some information about their demographic or socio-economic characteristics. Thus, our final sample covers information about 10239 individuals from the eighteen countries included in the dataset. These countries are: Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Honduras, México, Nicaragua, Panamá, Paraguay, Perú, Uruguay and Venezuela. The entire survey is treated as a large region-wide sample, with sampling weights[26] assigned in the whole dataset for each individual and country.

5.3.2. Variables.

Definition of Subjective Well-being

The Latinobarómetro data set for year 2007 provides different measures of subjective well-being. Respondents in the Latinobarómetro are asked about their life satisfaction, satisfaction with their job, free time, housing, household income and neighborhood, among others individual and social aspects[27]. For our purpose, we use the information about the individuals' self-assessed life and job satisfaction as measures of subjective well-being. Table 5.1 reports the main descriptive statistics of life and job satisfaction.

------- Insert Table 5.1 about here -------

Life satisfaction measure (*LS*) comes from the following question: "*Would you say that you are: (a) very satisfied, (b) fairly satisfied, (c) not very satisfied, (d) not at all satisfied?"*. We recoded the responses by assigning the integers 1 to 4 for each category from lower to higher life satisfaction (this means by reversing order into an ascending Likert scale where higher satisfaction is associated to higher score, so the

[26] In Dominican Republic, El Salvador, Guatemala, Honduras and Nicaragua the sample is weighted with respect to stratum; in Chile is weighted with respect to age, sex, educational level and geographical area; in Argentina with respect to sex and age; in Colombia with respect to age, sex, educational level and size habitat; in Paraguay with respect to type of area and, in Venezuela is weighted with respect to sex and educational level. In Bolivia, Brazil, Costa Rica, Ecuador, Mexico, Panama, Peru and Uruguay the sample is not weighted. More details also are provided by the Methodological Report (Latinobarómetro, 2009).

[27] For instance, the way the economy works in their country, the public safety, the democracy, the healthcare, the education and the public spaces to which they have access, among other things.

interpretation of results will be more intuitive). This provides a four ordered categorical variable, where the average level of satisfaction is 2.96 (standard deviation 0.85). About 70% of the individuals in the sample are in the two highest categories of satisfaction and only 4.1% report being not at all satisfied with their lives[28].

Our second measure of analysis is Job satisfaction (*JS*), which is obtained from the question: *"Could please tell me on a scale from 0 to 10, where "0" means you are "very dissatisfied" and "10" means you are "very satisfied": How satisfied are you with your work?"*. The average job satisfaction for our sample is 6.20 (standard deviation 2.56). The distribution of the responses to the job satisfaction questions shows that almost half of the individuals in the sample declare levels of satisfaction equal or above 7. This high level of job satisfaction in Latin American countries seems surprising, given the predominance of low quality of jobs in the region (Lora, 2008).

Definition of Explanatory Variables

In order to test the *Resource Hypothesis*, different measures of resources have been used in the literature. The reported periodical income or the expenses that individuals must assume to support their standard of living are commonly used as proxy of the material conditions or individuals' economic status (Blanchflower and Oswald, 2004a; Bookwalter and Dalenberg, 2010; Kingdon and Knight, 2006). In our case, neither income nor consumption data are collected in the Latinobarómetro. Notwithstanding, it provides information of certain goods and assets that households possesses. To approximate the level of the household's material well-being, we consider two different variables that provide us with complementary information. On the one hand,

[28] Among the Latin Americans, Costa Ricans are the most satisfied with their lives and Peruvians the most dissatisfied. When we compare average life satisfaction by country and objective indexes of quality of life, seems consistent that Costa Ricans report high levels of life satisfactions. According to Lora (2008), Costa Ricans have a generalized access to health care, education and basic public services. However, when we compare other countries with similar criteria, the picture is different. Nicaragua and Honduras are between the countries with the lowest income per capita in the region, a high proportion of their population are living below $2 a day and, at the same time, 38% and 42% of their population declare that they are very satisfied with their life. On the other hand, although Chile is one of the most prosperous countries in Latin America, the Chileans are in the fifteen position of happiness if we rank the countries of our sample by the mean answer to the life satisfaction question, they are among the most dissatisfied in the region.

we use information about the ownership over different assets to construct a weighted linear index of household wealth using the analysis of principal components[29] to derive those weights. Ten assets and services were considered: television, refrigerator, own house, computer, washer machine, mobile phone, car, a second or holiday house, running water and bathroom with shower. A similar index is used by the Latin American Public Opinion Project (LAPOP), with the difference that the LAPOP index includes information about the ownership of conventional telephone and microwave (Córdova, 2009), but they do not consider neither owning a house nor a second house. The constructed linear index derived from our analysis is used as proxy of the material welfare[30]and household wealth of each individual. The index is rescaled from 0 to 10 and will be referred to in our analysis as *Wealth*. The average value of our index in the sample is 5.80. Table 5.2 presents the main descriptive statistics of the variables used.

------- Insert Table 5.2 about here -------

Although our wealth index contains most of the information regarding the material individuals' circumstances, in Latin America (period 2007-2009) approximately 33 % of the population lives in poverty (ECLAC, 2010). Therefore, it seems necessary to consider another question in the data set that provides complementary information about individual's resources. Specifically, we use the question "*Has your household run out of money to buy food at any time during the past 12 months?*" Then, we include a dummy variable label *Food* equal to one if the individual reports that her household had difficulties to buy the food in the last 12

[29] The analysis of principal components is a statistical procedure to extract from a set of variables those few orthogonal linear combinations of the variables that capture the common information in the most satisfactory way. Consistently, the first principal component of a set of variables is the linear index of all the variables that captures the biggest quantity of information that is common to all the variables.

[30] Filmer and Pritchett (2001) proposed and used this procedure to estimate the relation between households' wealth and children's enrollment in the school in India. The authors compared this method with the use of consumer expenditures and they found that this simple index of assets has a high correlation with the information of the consumer expenditures of a household and it works as good, or better, as the information of expenses to make predictions of children's enrollment. Additionally, they showed the internal and external validity of this type of index, as well as its robustness to the inclusion of different assets.

months as a proxy of deprivation[31]. In our sample 30% of the individuals report to have had difficulties to buy the food, so are assigned to that deprivation category.

To test the *Labour Market Hypothesis*, we consider two different alternatives. Following the standard literature, in the first alternative, we compare only between being employed or self-employed. To this end, we consider two dummies defined as: *Employed* and *Self-employed*. Variable *Employed* is coded 1 if the individual is employed in a paid job and 0 otherwise. Self-employment status is measured with a dummy *Self-employed* takes on the value of 1 when individuals state that they are self-employed, and is 0 when people in the workforce are employed by an organization. In our sample, 55% of individuals are self-employed. The main criterion used to construct this classification is whether or not the remuneration received depends totally on the (potential) profits from the sales of the goods and services that are produced by the economic unit in which the job is located. If it does, then this is considered to be a self-employment job, and if it does not, then this is considered to be a paid employment job (ILO, 1993).

The second alternative, where our main contribution lays, considers the heterogeneous nature of self-employment, which allows us to capture which of the described opposed effects dominate: the independence and lack of hierarchy or the risk and instability of certain types of self-employment occupations. To this end, guided by the questions about the type of occupation of the individual included in the Latinobarómetro survey, we define four dummies that will substitute the *Self-employment* variable as presented in the first alternative. The dummy variable *Professional* takes value 1 if individual belongs to the group of self-employed lawyers, architects, engineers, etc., and 0 otherwise. Variable *BusinessOwner* is equal to 1 for those who are micro-entrepreneurs or/and the owners of larger businesses. Variable *Farmer/Fisherman* coded 1 if individual is a self-employed farmer of fisherman. Finally, variable *Precarious* takes value 1 for individuals who are making street services elementary occupations such as street vendors, shoe-shiners, window cleaners,

[31] The low spearman correlation between our wealth index and the measure of food deprivation avoids problems of multicollinearity in the posterior statistical analysis.

hawkers, etc. In our sample, 2% of the individuals in the labour market are self-employed professionals, 14% are business owners, 8% are farmers or fishermen and 31% are precarious self-employed. Given these occupation types we expect, *a priori*, that for the first two categories (*Professionals* and *BussinesOwner*) the effects on life and job satisfaction of the individuals' preferences for independency at the workplace and the procedural utility associated to these jobs dominate. However, for the last two variables (*Farmer/Fisherman* and *Precarious)* the effect of the risk and the instability involved in these activities might be dominant. The descriptive statistics on the differences in life and job satisfaction between self-employed and employed individuals and within the self-employed occupations, in Table 5.3, gives support to our *a priori* expectation.

------- Insert Table 5.3 about here -------

We find significant differences[32] between individuals satisfaction in the different kinds of self-employment, mostly in the labor dimension. The self-reported individuals' life and job satisfaction are different between employed and self-employed and within the self-employed individuals. Those self-employed professionals and business owners report to be in average more satisfied with their life and their job than employees in paid works. However, farmers, fishermen and precarious self-employees are on average less satisfied than other kind of self-employed and employed workers as well. As pointed out in the description of the hypothesis, although, these differences might reflect a multitude of characteristic that distinguish self-employed individuals from those who are in a paid employed, we expect that for the first two sub-categories (professionals and business owner) the effects on life and job satisfaction would be similar to those than have been found for developed economies because of the individuals' preferences for independency at the workplace and the possible procedural utility associated to these jobs. However, for the last two sub-categories, the farmer-fisherman and precarious self-employment,

[32] The test on the equality of means was rejected in all the cases with a p value lower than 0.01.

the effect could be negative given the risk and the instability involved in these activities.

Finally, a set of socio-demographic variables are included to control for the regularities covered by the *Socio-Economic Hypotheses.* We define the variable *Male* coded 1 if individual is a male and 0 otherwise. In our sample 64% of individuals are male. The age of the respondent is included with the variable *Age* measured in years. In order to test nonlinearity in the relationship between subjective well-being and age we include also age squared in the statistical analysis below (*Age squared*). The average age in the sample is 38.4 years. To cover marital status, we define a dummy *Single* that takes value 1 if individual is never married, a dummy *Married* that is coded 1 if individual is married or cohabiting, and a dummy *Other* coded 1 if the individual is separated, divorced or widowed. In our sample, 28% of the individuals have not been married and 61% have a partnership.

Five dummy variables cover all education categories in the data set. The variable *Illiterate* takes value 1 if the individual is illiterate. The dummy *Primary-Incomplete* is activated when the individual has not completed primary education. We differentiate between illiterate and primary incomplete education levels because having the ability to read and to write can make a difference in terms of capabilities in low income countries. If the individual has completed primary, secondary or university level of education, we construct the dummies *Primary, Secondary* and *University* respectively. In our sample, 9% of individuals are illiterate, 20% have not completed primary education, 32% have completed primary education, 28% have a secondary level of education, and finally 11% have a university degree.

While research for European countries and the US have found differences between blacks and whites' satisfaction with life (Blanchflower and Oswald, 2004a), we are interested in identifying these ethnic differences in Latin America between indigenous people and people from other ethnic groups. In this case we define four

dummy variables guided by the self-reported ethnic group: *Indigenous*, *Mestizo*[33], *White* and *Other* (include asian, black, mulato[34] and others). In our sample 10% of individuals are indigenous, 43% are mestizos, 27% are white and 19% are from other ethnical groups.

Finally, to capture the effect of the city size, we construct a set of dummy variables. Then, *MediumCity* is coded 1 if individual's town is with more than 10.000 inhabitants and is not capital city. Variable *SmallCit*y takes value 1 if individual's town is with less than 10.000 inhabitants; and variable *CapitalCity* that is activated if individual lives in a capital city. In our sample, 70% of the individuals live in a medium city, while 14% in a small city. As it was already mentioned, all the descriptive statistics are presented in Table 5.2. Definitions of the variables used are given in the appendix A.

5.4. Empirical Model.

As described before, we will consider two different variables to measure individuals' subjective well-being: life satisfaction (LS_i) and job satisfaction (JS_i). The response of the individual i to the subjective well-being question (LS_i or JS_i) is modeled as a manifestation of the latent and continuous variable (LS_i^* or JS_i^*) In line with prior literature, we assume that each individual makes an evaluation of her satisfaction with life LS_i^* or with job JS_i^*, and classifies it under one of the categories to her disposition. As it has been already exposed in Chapter 2, these choices are modeled assuming that the underlying subjective well-being (LS_i^* or JS_i^*) is a linear function of a set of observable (Z_i) and unobservable factors (ε_i) as $LS_i^* = Z_i'\beta + \varepsilon_i$. It is also assumed the existence of a set of $K-1$ parameters ordered thresholds, such that the individual responds category k if and only if $LS_i^* \in (\mu_{k-1}, \mu_k]$. Assuming independence between ε_i and Z_i, the probabilities of the observed outcomes are derived from:

[33] The individual classified herself as a person of mixed race, particularly of indigenous and white parentage.
[34] Individuals of black and white parents.

$$\Pr(LS_i = k) = \mathrm{F}(\mu_k - Z_i'\beta) - \mathrm{F}(\mu_{k-1} - Z_i'\beta)$$

where F is the cumulative distribution function (c.d.f) of ε_i. The random error term ε_i is assumed to follow a normal standardized distribution; therefore we will estimate an ordered probit model. The regression parameters β, and the $K-1$ threshold parameters, $\mu_0, \ldots, \mu_{K-1}$ are obtained by maximizing the log likelihood function subject to $\mu_k > \mu_{k-1}$ for all k.

Recall that in the present chapter we have presented three hypotheses and a set of variables to test them. Specifically, this latent satisfaction (LS_i^* or JS_i^*) is assumed to be related linearly to the individual's resources (y_i), her labor status (LMS_i) and other socio-economic characteristics (X_i modeled by variables). It is likely that other regional factors that are correlated with cultural distinctiveness also affect well-being. To control for these effects not covered in the socio-economic characteristics, we include country dummies.

Given that our contribution is the choice of variables to test the *Labor Market Status* hypotheses, we adjust two distinct regression models for LS_i^* and JS_i^*. The first specification (*Model A)* follows the related literature to study de influence of labor status on life (LS_i^*) and job satisfaction (JS_i^*). Accordingly, we estimate the following equation:

$$LS_i^* = \alpha + \varphi' y_i + \beta \textit{ Self-employed} + \gamma' X_i + \tau' C + \varepsilon_i \qquad \text{(A)}$$

where y_i and X_i represent individual's resources and characteristics; C counts for country fixed effects, and ε_i is a random error term normally distributed. The explanatory variable *Self-employed* allows us to investigate whether there are differences in the average subjective well-being reported from *employed* (baseline category) and *self-employed* individuals in Latin American countries. Notice that, there are prior hypotheses we are willing to test: the first coefficient (associated to the variable *Wealth*) in the vector φ is expected to be positive, and the second one (*Food*) negative. There is an ambiguous expected sign for β, because given the evidence from developed economies it could be that the effect is positive $\beta > 0$. However, some

previous studies for Latin American countries find just the opposite ($\beta < 0$) (Graham and Felton, 2005, 2006; Graham and Pettinato, 2001), while some others find evidence that could be interpreted as following the same pattern ($\beta > 0$) than developed countries (Lora, 2008). In order to disentangle these apparently opposed and non conclusive evidences for Latin American countries, we propose Model B as a second alternative:

$$LS_i^* = \alpha + \varphi' y_i + \beta_1 Professional + \beta_2 BusinessOwner$$

$$+\beta_3 Farmer/Fisherman + \beta_4 Precarious + \gamma' X_i + \tau' C + \varepsilon_i \qquad \text{(B)}$$

This second alternative includes four dummies regarding different self-employment occupation types, in substitution of the variable *Self-employed* in Model A. If the coefficients associated to the different types of self-employment are not statistically different, then there is not significant heterogeneity in the effect of self-employment on individual satisfaction. Concerning our hypothesis, we expect the following:

β_1 and $\beta_2 \geq 0$	Professional and business owner self-employed workers are more or equally satisfied than the employed.
β_3 and $\beta_4 \leq 0$	Farmer, fishermen and precarious self-employed workers are equally or less satisfied than the employed.
$\beta_1 = \beta_2 = \beta_3 = \beta_4$	There is not heterogeneity among the self-employment occupation types. Therefore, *Model A* would be equivalent to *Model B*.

They both *Model A* and *Model B* are proposed for life (*LS*) and job satisfaction (*JS*).

As mentioned in Chapter 2, in the ordered response models -as the one use in the present study-, the sign of the estimated parameters β can be interpreted as determining whether satisfaction changes with the regressor. If the estimated

parameter is positive, then an increase (decrease) in the value of a given continuous variable, *ceteris paribus*, leads to an increase (decrease) on the probability of being in the highest category of satisfaction. However, the sign of the marginal effect in intermediate categories is ambiguous, since it depends of the difference of two densities (Greene, 2009). Thus, in order to have a whole picture of the influence of the different types of self-employment on subjective well-being, a further analysis presents the marginal effects of the variables associated to labor status in the two proposed models (A and B).

5.5. Results.

We present the estimation results for life (*LS*) and job satisfaction (*JS*) regression models in Table 5.4. The estimated coefficients in Model A and Model B are close between them, indicating robustness of the estimation procedure.

------- Insert Table 5.4 about here -------

Concerning our principal aim, that is, to test whether there are differences between the individuals' subjective well-being regarding their employment status, our results show the following findings. On the one hand, the estimation results show that Latin American self-employed are less satisfied than the employed (Model A), although this difference is only significant at approximately 15% (17% in the case of life satisfaction and 11% in job satisfaction). To the usual significance levels (10% or 5%) there are no differences between self-employed and employed individuals neither in life, nor in job satisfaction[35]. This negative and relative weak influence of self-employment is similar to the findings of Graham and Pettinato (2001) for Latin

[35] Although, self-employment has a strong negative effect on life satisfaction when country effects are not controlled for (see Table C1 in the appendix), this effect becomes insignificant when country effects are included. Besides cultural differences, it is likely that the inclusion of country dummies also control for other regional factors that are correlated with country social norms associated to employment, and that may attenuate the negative influence of self-employment on individual subjective well-being, such as was shown by Clark (2003) in the case of unemployment.

American countries, but contrary to the results from developed countries by van Praag and Ferrer-i-Carbonell (2004).

On the other hand, when the category self-employed is splitted into the four occupation types presented before (Model B), the results change. Evidence shows that professionals, business owners and farmers or fishermen self-employed do not present statistically significant differences in their levels of satisfaction compared with the employed. The corresponding test shows no significant differences in the estimated coefficients for each occupation self-employment type. The highlighted result is that precarious self-employed have significant lower life satisfaction than employed as it was expected. The negative influence of the risk and instability associated to these *precarious* occupations seem to dominate the independence effect of self-employment.

The changes on job satisfaction from Model A to Model B are even showier. There are not statistically significant differences between the reported job satisfaction from self-employed professional or farmer-fisherman compared with that reported for the employees. Those self-employed business owners are more satisfied with their jobs than the employed, which indicates that the procedural utility derived from the independence and absence of hierarchy of these jobs dominates the possible negative effect of their risk and instability. However, in line with the *Labor Market Hypothesis*, being a precarious self-employed has a negative effect on job satisfaction, the instability and economic insecurity associated to these precarious occupations dominate the effect of independence. Each of these occupation types affects job satisfaction in a different way (test of equality of coefficients with $p\text{-}value < 0.001$) supporting the hypothesis of the heterogeneous influence of self-employment.

A further analysis of the marginal effects (Tables 5.5 and 5.6) shows that being a precarious self-employment decrease the probability of reporting to be very satisfied with life or completely satisfied with job in 0.018 points, compared with the employed. Likewise, individuals in a precarious self-employment occupation are more likely to response *not very satisfied* than employed people with similar socio-economic

characteristics. In the case of job satisfaction being a business owner increase the probability of being in levels of job satisfaction above the average (7), with the largest influence in the probability of response the highest satisfaction (10), which means that a business owner is 0.015 more likely to report being *very satisfied* with her job than an employed. Conversely, comparing with individuals in paid jobs, holders of precarious occupations are more likely to response levels of job satisfaction below the average.

------- Insert Table 5.5 and 5.6 about here -------

Concerning the *Resources* and *Socio-Economic hypotheses,* most of the estimated parameters have the expected signs. Our evidence supports the *Resources Hypothesis*. In particular, the individuals' material conditions, gathered by *Wealth*, have a positive effect on their life and job satisfaction, and obviously *Food,* which accounts for individual material deprivation, has a negative influence

Regarding the regularities from the *Socio-Economic Hypotheses*, there is no gender effect nor in life neither in job satisfaction. Life satisfaction diminishes with age, until it reaches a minimum and then increases (negative estimated parameter for *Age* and positive for its squared). Similar to the findings in Lora (2008), the minimum for life satisfaction is reached around the forties. In case of job satisfaction, estimated parameters (positive for *Age* and non-significant for *Age squared)* indicate that there is a weak positive and linear correlation between age and job satisfaction. This result is the opposite of the one in Rojas (2007), who, for the Mexicans[36], shows that job satisfaction tends to decrease with age, and also to the evidence from developed countries (Clark and Oswald, 1996; van Praag and Ferrer-i-Carbonell, 2004).

In relation with marital status, while being married does not have effect on life and job satisfaction, the separated, divorced or widowed individuals are less satisfied with their lives than single individuals. Although, previous studies for Latin American countries have found that education variables have a highly significant effect over life

[36] When we made the regression analysis considering only workers in Mexico, we do not find any age effects on job satisfaction, which is similar to our findings for the whole Latin American sample.

satisfaction (Graham and Felton, 2006), in our sample only the variable *University,* associated to the highest educational level, has a positive effect on life and job satisfaction. One of the possible reasons of this difference between previous results and ours is that in the last case the analysis is limited to workers' subjective well-being. Nevertheless, when individual's material wealth is not controlled for (see Table C2), these variables of education are positive and highly significant, given the high correlation that exists between education and wealth[37]. Argyle (1999) showed that education affects income and occupational status, both of which, he summarize, as important causes of happiness. In the same line, he affirmed that these effects of education on occupational and social status could explain the strong effects of education in developing countries.

While the research for European countries and the U.S. has found differences between blacks and whites' satisfaction (Blanchflower and Oswald, 2004a), we found that the whites are more satisfied with their life than indigenous individuals, although these differences are not observed on the labor dimension. Finally, living in a capital city has a negative effect on life and job satisfaction, while people who are living in small cities are more satisfied with their job than people in large urban areas.

5.6. Conclusions.

The purpose of this chapter has been to contribute to the research about the determinants of subjective individual well-being in Latin American and Caribbean countries, with particular attention to the relationship between employment types and satisfaction, by using the Latinobarometro survey from the year 2007 and analyzing two different subjective measures: life and job satisfaction.

[37] When individual's resources are not controlled for, the variable *Farmer\Fisherman* appears being significant, showing that people in this occupation type are less satisfied than the employed. The reason of this result might be associated to the construction of our proxies of resources, because the ownership of the assets we consider could be not related (enough) with the level of educational attainment for people with a farmer or forestry occupation.

There are two results worthwhile noticing. First, we find that, compared with employed people, self-employed do not report different levels of satisfaction with their life and their job. However, this last finding is examined in a deeper way in order to explore the effect of different types of works on individuals' satisfaction. Thus, our second result shows that in Latin American countries self-employed is a heterogeneous category and its effect on life and job satisfaction is associated to the sort of self-employment analyzed. Our evidence is complementary to previous literature about Latin American countries (Graham and Felton, 2006; Graham and Pettinato, 2001; Lora, 2008).

We have shown that, for some self-employed, the autonomy and flexibility of their occupation seems to be considered an advantage if they are compared with employed, which is the case of the professional and business owner self-employed and corresponds with the findings from Lora (2008). However, for other categories of self-employed, the economic insecurity and the lack of stability associated to their *precarious* works avoid that their occupation as self-employed can be considered an opportunity for personal growth or a source of satisfaction. This latter evidence goes in line with the findings of Graham and Felton (2005; 2006) and Graham and Pettinato (2001).

The evidence presented here only provides support for precariousness effect of self-employment for Latin Americans. However, the analysis of the effect of different labor market status on subjective well-being could be done regarding the unprotectedness and precariousness of some self-employment occupations. There exists considerable heterogeneity within both, salaried and self-employed works in Latin American countries in terms of pay, hours of work, job security and other job features. Although, we could not consider these variables in analysis presented in this chapter, recent studies for developed countries have shown the importance of these factors in the self-assessed job satisfaction (Bardasi and Francesconi, 2004; Clark, 2010; Clark et al., 2010).

Although in this work we control for a large number of variables, we find that these are only a few of those that have a statistically significant effect on individuals' well-being. Future research in the analysis of satisfaction in Latin America demands better sources of information. Including this work, recent studies from developed and developing countries advice the need of pay greater attention to the heterogeneity in the labor market in terms of the current labor position, procedural dimensions of employment and the individual's future prospects. As suggested by the Inter-American Development Bank (Lora, 2008), data documenting such characteristics should be collected and taken into account in the design of policies.

Appendix A.

Description of the Explanatory Variables

Explanatory Variables	Description
Resources	
Wealth	Weighted linear index about the ownership of the following assets: television, refrigerator, own-house, computer, washer machine, cell phone, car, second house, running water and bathroom with shower. The weights are derived from the first principal component, and then it is rescaled from 0 to 10.
Food	Dummy variable: 1 if individual has run out of money to buy food at any time during the past 12 months; 0 otherwise.
Labor Market Status	
Employed	Dummy variable: 1 if employed in paid employment; 0 otherwise.
Self-employed	Dummy variable: 1 if self-employed; 0 otherwise.
Professional	Dummy variable: 1 if individual is a self-employed professional; 0 otherwise.
BusinessOwner	Dummy variable: 1 if business owner; 0 otherwise.
Farmer/Fisherman	Dummy variable: 1 if individual is a self-employed farmer or fisherman; 0 otherwise.
Precarious	Dummy variable: 1 if individual is an own account worker: Street vendors, shoe-shiners, window cleaners, etc.; 0 otherwise.
Socio-demographic Characteristics	
Male	Dummy variable: 1 if male; 0 if female
Age	Age in years.
Age squared	Age to the squared.
Marital Status	
Single	Dummy variable: 1 if never married; 0 otherwise.
Married	Dummy variable: 1 if married; 0 otherwise.
Other	Dummy variable: 1 if separated, divorced or widowed; 0 otherwise.
Education	
Illiterate	Dummay variable: 1 if illiterate; 0 otherwise.
Primary-Incomplete	Dummy variable: 1 if primary incomplete; 0 otherwise.
Primary	Dummy variable: 1 if primary; 0 otherwise.
Secondary	Dummy variable: 1 if secondary; 0 otherwise.
University	Dummy variable: 1 if university; 0 otherwise.
Self-reported Ethnicity	
Indigenous	Dummy variable: 1 if indigenous; 0 otherwise.
White	Dummy variable: 1 if white; 0 otherwise.
Mestizo	Dummy variable: 1 if mestizo; 0 otherwise.
Other	Dummy variable: 1 if asian, black, mulato and others; 0 when self-reported ethnicity is indigenous, white or mestizo.
City size	
MediumCity	Dummy variable: 1 if individual's town is with more than 10.000 inhabitants and is not capital city; 0 otherwise.
SmallCity	Dummy variable: 1 if individual's town is with less than 10.000 inhabitants; 0 otherwise.
CapitalCity	Dummy variable: 1 if capital city; 0 otherwise.

Appendix B

Table 5.1. Dependent Variables - Descriptive Statistics.

Dependent Variables	Mean/Proportion	St. Deviation	Min	Max
Life Satistaction	2.97	0.84	1	4
Not at all satisfied	0.04			
Not very satisfied	0.25			
Fairly satisfied	0.42			
Very satisfied	0.30			
Job Satisfaction	6.20	2.56	0	10
Very Dissatisfied	0.03			
1	0.02			
2	0.04			
3	0.06			
4	0.08			
5	0.18			
6	0.13			
7	0.13			
8	0.13			
9	0.07			
Very Satisfied	0.13			

The sample used comprises information from 10239 individuals with a valid life and job satisfaction.

Table 5.2. Explanatory Variables - Descriptive Statistics.

Explanatory Variables	Mean/Proportion	St. Deviation	Min	Max
Resources				
Wealth	5.80	2.37	0	10
Food	0.30	0.46	0	1
Labor Market Status				
Employed	0.45	0.50	0	1
Self-employed	0.55	0.50	0	1
Professional	0.02	0.14	0	1
BusinessOwner	0.14	0.34	0	1
Farmer/Fisherman	0.08	0.27	0	1
Precarious	0.31	0.46	0	1
Socio-demographic characteristics				
Male	0.64	0.48	0	1
Age	38.40	13.50	16	87
Marital Status				
Single	0.28	0.45	0	1
Married	0.61	0.49	0	1
Other	0.11	0.31	0	1
Education				
Illiterate	0.09	0.29	0	1
Primary-Incomplete	0.20	0.40	0	1
Primary	0.32	0.47	0	1
Secondary	0.28	0.45	0	1
University	0.11	0.31	0	1
Ethnicity				
Indigenous	0.10	0.30	0	1
White	0.27	0.45	0	1
Mestizo	0.43	0.50	0	1
Other	0.19	0.39	0	1
City size				
MediumCity	0.70	0.46	0	1
SmallCity	0.14	0.35	0	1
CapitalCity	0.16	0.37	0	1
Sample size		10239		

Table 5.3. Life and Job Satisfaction by Labor Market Status.

Labor Market Status	Proportion	Life Satisfaction		Job Satisfaction	
		Mean	S. D.	Mean	S. D.
Employed	0.45	3.04	0.80	6.39	2.46
Self-employed	0.55	2.92	0.87	6.04	2.64
Professional	0.02	3.19	0.78	6.98	2.44
BusinessOwner	0.14	2.97	0.84	6.47	2.43
Farmer/Fisherman	0.08	2.86	0.88	5.70	2.76
Precarious	0.31	2.89	0.88	5.88	2.67

Table 5.4. Life and Job Satisfaction Estimation Results for Latinobarómetro 2007.

Explanatory Variables	Life Satisfaction		Job Satisfaction	
	Model A	Model B	Model A	Model B
Resources				
Wealth	0.056***	0.056***	0.086***	0.083***
	(0.007)	(0.007)	(0.006)	(0.006)
Food	-0.221***	-0.220***	-0.294***	-0.292***
	(0.027)	(0.027)	(0.025)	(0.025)
Labor Market Status				
Employed	Ref.	Ref.	Ref.	Ref.
Self-employed	-0.033		-0.037	
	(0.024)		(0.023)	
Professional		0.027		0.041
		(0.085)		(0.076)
BusinessOwner		-0.012		0.075**
		(0.035)		(0.032)
Farmer/Fisherman		-0.002		-0.050
		(0.048)		(0.046)
Precarious		-0.055**		-0.093***
		(0.028)		(0.026)
Socio-demographic characteristics				
Male	0.001	-0.001	0.010	0.014
	(0.024)	(0.024)	(0.022)	(0.022)
Age	-0.179***	-0.180***	0.083*	0.077*
	(0.049)	(0.049)	(0.046)	(0.047)
Age squared	0.017***	0.017***	-0.007	-0.007
	(0.006)	(0.006)	(0.005)	(0.005)
Marital Status				
Single	Ref.	Ref.	Ref.	Ref.
Married	0.034	0.033	-0.009	-0.011
	(0.029)	(0.029)	(0.027)	(0.027)
Other	-0.118***	-0.116**	-0.074*	-0.072*
	(0.046)	(0.046)	(0.043)	(0.043)
Education				
Illiterate	Ref.	Ref.	Ref.	Ref.
Primary-Incomplete	0.031	0.035	-0.001	-0.001
	(0.047)	(0.048)	(0.045)	(0.045)
Primary	0.028	0.034	0.038	0.036
	(0.047)	(0.048)	(0.045)	(0.046)
Secondary	0.091*	0.094*	0.045	0.036
	(0.051)	(0.052)	(0.049)	(0.050)
University	0.222***	0.215***	0.111*	0.093
	(0.061)	(0.063)	(0.057)	(0.058)
Ethnicity				
Indigenous	Ref.	Ref.	Ref.	Ref.
White	0.081*	0.083*	-0.069	-0.068
	(0.049)	(0.049)	(0.046)	(0.046)
Mestizo	0.056	0.057	-0.062	-0.060
	(0.044)	(0.044)	(0.040)	(0.040)
Other	0.057	0.059	-0.010	-0.006
	(0.049)	(0.049)	(0.046)	(0.046)
City size				
MediumCity	Ref.	Ref.	Ref.	Ref.
SmallCity	-0.020	-0.024	0.136***	0.131***
	(0.036)	(0.036)	(0.035)	(0.036)
CapitalCity	-0.075**	-0.075**	-0.085***	-0.085***
	(0.035)	(0.035)	(0.031)	(0.031)
Prob > F		0.448		0.000
Country dummies	Yes	Yes	Yes	Yes
Observations	10239	10239	10239	10239

Standard errors in parentheses. * p<0.1, ** p<0.05, *** p<0.01. Prob > F shows the p-value associated to the test of the equality of the coefficients of the self-employment occupational types: $\beta_1 = \beta_2 = \beta_3 = \beta_4$.

Table 5.5. Marginal Probability Effect by Life Satisfaction Level.

	Satisfaction level			
	LS = 1	**LS = 2**	**LS = 3**	**LS = 4**
Model A				
Employed	Ref.	Ref.	Ref.	Ref.
Self-employed	0.002 (0.002)	0.009 (0.006)	0.000 (0.000)	-0.011 (0.008)
Model B				
Employed	Ref.	Ref.	Ref.	Ref.
Professional	-0.002 (0.006)	-0.007 (0.022)	-0.000 (0.001)	0.009 (0.029)
BusinessOwner	0.001 (0.002)	0.003 (0.009)	0.000 (0.000)	-0.004 (0.012)
Farmer/Fisherman	0.000 (0.003)	0.000 (0.012)	0.000 (0.000)	-0.001 (0.016)
Precarious	0.004* (0.002)	0.014** (0.007)	0.000 (0.000)	-0.018** (0.009)

Standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. These results are adjusted including all the socio-economic control variables and country dummies used in Table 5.4.

Table 5.6. Marginal Probability Effect by Job Satisfaction Level.

	Satisfaction Level										
	JS = 0	**JS = 1**	**JS = 2**	**JS = 3**	**JS = 4**	**JS = 5**	**JS = 6**	**JS = 7**	**JS = 8**	**JS = 9**	**JS = 10**
Model A											
Employed	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.
Self-employed	0.002	0.001	0.002	0.003	0.003	0.004	0.000	-0.001	-0.003	-0.003	-0.007
	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)	(0.000)	(0.001)	(0.002)	(0.002)	(0.004)
Model B											
Employed	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.
Professional	-0.002	-0.001	-0.002	-0.003	-0.003	-0.004	-0.001	0.002	0.004	0.003	0.008
	(0.003)	(0.003)	(0.004)	(0.005)	(0.006)	(0.008)	(0.001)	(0.003)	(0.006)	(0.006)	(0.016)
BusinessOwner	-0.003**	-0.003**	-0.004**	-0.005**	-0.006**	-0.008**	-0.001*	0.003***	0.006**	0.006**	0.015**
	(0.001)	(0.001)	(0.002)	(0.002)	(0.003)	(0.003)	(0.001)	(0.001)	(0.003)	(0.002)	(0.007)
Farmer/Fisherman	0.002	0.002	0.003	0.004	0.004	0.005	0.000*	-0.002	-0.004	-0.004	-0.009
	(0.002)	(0.002)	(0.003)	(0.003)	(0.004)	(0.004)	(0.000)	(0.002)	(0.004)	(0.003)	(0.009)
Precarious	0.004***	0.004***	0.005***	0.007***	0.007***	0.009***	0.001***	-0.004***	-0.008***	-0.007***	-0.018***
	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)	(0.002)	(0.000)	(0.001)	(0.002)	(0.002)	(0.005)

Standard errors in parentheses. * p < 0.1, ** p < 0.05, *** p < 0.01. These results are adjusted including all the socio-economic control variables and country dummies used in Table 5.4.

Appendix C

Table C1. Life and Job satisfaction without Country Fixed Effects.

	Life Satisfaction		Job Satisfaction	
	Model A	**Model B**	**Model A**	**Model B**
Employed	Ref.	Ref.	Ref.	Ref.
Self-employed	-0.063***		-0.025	
	(0.023)		(0.022)	
Professional		0.102		0.068
		(0.081)		(0.074)
BusinessOwner		-0.040		0.067**
		(0.034)		(0.031)
Farmer/Fisherman		-0.052		-0.006
		(0.047)		(0.045)
Precarious		-0.091***		-0.080***
		(0.027)		(0.026)
Socio-economic controls	Yes	Yes	Yes	Yes
Prob > F		0.085		0.000
Country fixed effects	No	No	No	No
Observations	10239	10239	10239	10239

Standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. The socio-economic controls include all the variables used in Table 5.4. Prob > F shows the p-value associated to the test of the equality of the coefficients of the self-employment occupational types: $\beta_1 = \beta_2 = \beta_3 = \beta_4$.

Table C2. Life and Job satisfaction without Wealth Variables.

	Life Satisfaction	Job Satisfaction
Employed	Ref.	Ref.
Professional	0.071	0.105
	(0.085)	(0.075)
BusinessOwner	0.018	0.114***
	(0.035)	(0.032)
Farmer/Fisherman	-0.076	-0.156***
	(0.047)	(0.046)
Precarious	-0.071**	-0.115***
	(0.027)	(0.026)
Education		
Illiterate	Ref.	Ref.
Primary-Incomplete	0.093**	0.081*
	(0.047)	(0.045)
Primary	0.139***	0.183***
	(0.047)	(0.045)
Secondary	0.274***	0.288***
	(0.050)	(0.048)
University	0.464***	0.442***
	(0.058)	(0.054)
Controlling by resources variables	No	No
Other socio-economic controls	Yes	Yes
Country dummies	Yes	Yes
Observations	10239	10239

Standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. The socio-economic controls include all the variables used in Table 5.4.

6. SOCIAL INTERACTIONS AND SUBJECTIVE WELL-BEING: EVIDENCE FROM LATIN AMERICA.

6.1. Introduction.

The research of quality of life based on a subjective approach documents mainly two ways in which individuals' subjective well-being is influenced by a social dimension of economic behavior. On the one hand, it is recognized by the literature that people compare themselves to some reference group when making consumption decisions. Thus, an individual's welfare depends on that individual's own absolute but also relative (or positional) situation or status (see e.g. Duesenberry, 1949; Frank, 1985a, 1985b, 1999; Hirsh, 1976). This is often referred as *comparison effect* or *relative utility* effect. As it is argued by Bruni and Stanca (2008), these positional theories used in happiness economics are social, in the sense that positional competition cannot exist in the Robinson's island, but the kind of sociality considered has not reference to the interpersonal relationships as a source of well-being. On the other hand, recent economic studies have started to explore the effects of interpersonal relationships on economic performance, welfare and subjective well-being (Gui and Sugden, 2005; Meier and Sutzer, 2008). Interpersonal relationships with similar others and in more heterogeneous circles, as sources of social capital, have been pointed out as instruments of social change and development. Moreover, empirical evidence has

identified interpersonal relationships as one of the major source of happiness (among others, see Helliwell, 2001, 2003, 2006; Helliwell and Putnam, 2004).

Some sociological and economic literature has argued on the importance of networks, community ties and kinship as a tool for development and poverty alleviation. Robinson et al. (2003) stand out the value of social capital because its ability to produce economic benefits and, if neglected, economic disadvantages. Following this enthusiastic endorsement, the World Bank and other developments agencies in recent years have focused their interest on the social capital analysis to enrich development debates. In this respect, some studies from the United Nations agency ECLAC (2003) have point out that social capital in Latin America is emulating its rapid progress elsewhere in the world. Molyneux (2002) notices that, for many observers in the development field, Latin America seems to have a comparative resilient stock of social capital that is also identified as a fairly active civil society[38].

Although, the two mentioned social influences are recognized as important determinants of individuals' well-being, they are mostly studied from different approaches that pay slightest attention to the interrelations between them. Besides, most of the empirical evidence about subjective well-being and social influences has been concentrated on developed economies and there are only few studies for Latin America (Graham and Felton, 2006; Lora, 2008; Rojas, 2006b), where social interrelations are not the main focus.

Using a large survey from Latin American and Caribbean countries, this chapter moves along this direction of research. We study, among other factors associated to individual's well-being, the role of social influences in their form of social comparisons and interpersonal relationships. Unlike much of the work for subjective well-being in Latin American countries (Graham and Felton, 2006; Lora, 2008), one of the contributions of this work is to add to the empirical literature on the effect of these two recognized sources of well-being jointly.

[38] This argument must be understood in relative terms, because the social capital of bowling clubs and sewing groups in the United States is clearly not the social capital of the poor in Latin America. In these countries civil society is scattered, largely urban, and differs markedly among countries (Molyneux, 2002).

In the recent existing economic literature, it is recognized that individuals are socially influenced in many ways (for a review see Blume and Durlauf, 2005). There are *interdependences* between individuals' behavior and their self-evaluation of outcomes are affected by others' outcomes within a common group (Blume et al., 2011). Due to this interdependence of preferences, individual subjective well-being does not only depend on the own consumption, income, and other material circumstances, but also on her achievement in comparison with some benchmark.

Under this *comparison effect*, the individual's current reported subjective well-being is based on a norm of what is *bad*, *sufficient* or *good*. Such norms do not only depend on the present situation, but also on what the individual has experience in the past, on what she expects to experience in the future, and on what other people think and do (van Praag and Ferrer-i-Carbonell, 2004). Therefore, comparison can be of two types: (i) *internal benchmarks*, which involve aspirations and dynamic comparisons with one's own situation in different points of time, and (ii) *external benchmarks*, i.e. comparisons with some peers or relevant others, such as neighbors, co-workers, parents, etc.

In this chapter we focus our analysis in *external benchmarks*. For *external benchmarks*, it is usually assumed that individual's well-being depends on the individual's own resources as well as on the resources of a reference group. However, surveys usually contain no direct questions about the composition of the reference groups and, with few exceptions (Clark and Senik, 2010; Kingdon and Knight, 2007; Senik, 2009), there is no direct evidence to identify those whom people really compare themselves to. Most of the time, researchers define by themselves the reference groups based on some observable characteristics of the respondents, thus imposing exogenously determined peers.

In this way, the hypothesis that commonly appears in the literature is whether the others' resources exert a negative effect on subjective well-being (Clark and Oswald, 1996; Clark et al., 2008; Ferrer-i-Carbonell, 2005; Luttmer, 2005; McBride, 2001). Moreover, that influence is hypothesized to be non-symmetric (Duesenberry. 1949). Further evidence at this respect (Caporale et al., 2009; Clark, et al., 2009; Clark

and Senik, 2010; Kingdon and Knight, 2007; Senik 2004, 2008) has shown the possibility of two types of effects: the standard negative influence associated to *envy* feelings, where others' good news are bad news for us; and the *ambitions* or *signal* effects, whereby the outcomes of the reference group contains information about the individual's own future prospects. The individual's gratification from the advances of others was early identified by Hirschman and Rothschild (1973), who label these *signal* influences as a tunnel effect[39]. In this latter case, resources comparisons may increase the well-being even of those who are relatively poor (Clark and Senik, 2010). A survey about this literature has been already presented in Chapter 3, and an extensive test of this relative resources hypothesis is presented in the next chapter.

Concerning the influence of interpersonal relationships on subjective well-being, many cross-sectional studies from sociology and economics have shown that individuals with active social relationships tend to be happier with their lives. Social support or social networks (and the associated norms of reciprocity and trust) have powerful effects on the level of efficiency of production and well-being (Helliwell and Putnam, 2004). Social scientists have used the term social capital to refer to these effects (Coleman, 1988; Narayan, 1999; Putnam, 2000; Woolcock and Narayan, 2000). Portes (1998), for instance, characterizes social capital as an element inherent to the structure of the individual's relationships. He emphasizes that to possess social capital, a person must be related to others, and it is others, not himself, who are the actual source of her advantage.

Empirical evidence has shown that interpersonal relationships with people in different levels of closeness matter and have impact on individual and collective outcomes, being the effect on subjective well-being one of the most outstanding. Following Helliwell and Putnam (2004), a common finding from a half century's research on the correlates of subjective well-being is that happiness is best predicted by the breadth and depth of one's social connections. At this respect, there is also an alternative reverse causality interpretation where correlation between social

[39] Hirschman and Rothschild (1973) suggest that individuals can derive positive utility from observe other people's progression and compare it with the positive signal where in a lane of cars, the other lane of cars starts progressing towards the exit while our lane is still immobile during a traffic jam inside a tunnel, that progress is interpreted as a positive signal with respect to likely future outcome.

circumstances and subjective well-being might reflect the effects and not the causes of subjective well-being. Helliwell (2001, 2006) presents a discussion and evidence about this mutual causality and the effect of personality differences, which are likely to influence life satisfaction and the frequency of contacts. He tested how robust are the estimates of the life satisfaction equations to the inclusion of a personality-based variable and found that all the coefficients on social capital variables were unaffected by the inclusion of this personality variable (Helliwell, 2006), arguing in favor of the causality.

The empirical studies of social capital have led to distinguish between different types of social capital. Particularly, a distinction has been made between *bonding* and *bridging* social capital (Putnam, 2000). *Bonding* relates to closed networks with people with the same background, whereas *bridging* entails crosscutting ties (e.g. associations that bring citizens into contact with people from a cross-section of society). At this respect, *bridging* associations are identified as more likely to generate positive externalities than *bonding* associations. Interpersonal relationships and interactions on crosscutting networks lead to the collective good of citizens (Woolcock and Narayan, 2000) and have greater effects on the development of generalized trust than the relations only with individuals who are similar to oneself (Marshall and Stolle, 2004). Likewise, evidence suggests that most individuals receive social support mostly from *bonding* rather than *bridging* social ties (Putnam and Goss, 2002).

The existing studies do not make an explicit distinction between the effect of *bonding* and *bridging* social relationships on individual's self reported well-being. However, some of them include the effect of relationships with friends and relatives, and participation in organizations as different sources of happiness (e.g. Helliwell and Putnam, 2004; Powdthavee, 2008). In particular, the little empirical evidence from Latin American countries that considers interpersonal relationships as a source of individual well-being (Lora, 2008; Rojas, 2006b) does not consider any distinction. Given that an adequate empirical operationalization of *bridging* and *bonding* social ties is not straightforward, some authors as Beugelsdijk and Smulders (2003) and Sabatini (2006) have proposed that *bonding* social relationships consist of closed networks of

family and friends, while *bridging* social relationships are associated with membership in religious, cultural, sports, women's or youth groups.

The need for research that combines these two described social influences becomes evident. While prior research has shown the importance of social comparisons and interpersonal relationships on individuals' well-being, scientists have pay slightest attention to the interrelations between these two sociality factors and the evidence has been focused on developed countries. Stutzer (2004), using data from Switzerland, find evidence that the average income situation in the community where an individual lives is much more important for the aspirations levels of people who interact with their neighbors. In his study, Stutzer showed that, in general, others' average income has an important negative influence on individual's aspiration; however this effect is twice much higher for people who have contact with their neighbors. Luttmer (2005) investigates whether individuals feel worse off when their neighbors earn more. Combining the American Survey of Families and Households with the Census and the Current Population Survey data, he finds that increased neighbors' earnings have the strongest negative effect on happiness for those who socialize more in their neighborhood. A recent and pertinent study by Clark and Senik (2010), by using the European Social Survey collected in 2006/7, finds that people compare to the groups with whom they interact more frequently and that colleagues are the most frequently cited reference group. While we study subjective well-being in less developed countries, we follow Stutzer (2004) and Luttmer's (2005) lead in aiming to involve social influences and testing the interaction effect between them.

The psychological literature is also relevant at this respect (for a review see Schwarz and Strack, 1999). Social psychology research (e.g. Festinger, 1954; Schachter, 1959) has shown that evaluation against a less fortunate other may be *ego-enhancing*, but contact with such people may also be depressing and frightening. In the same way, contact with better-off targets can be motivating and inspirational, but direct evaluation of one's current status against such targets could be *ego-deflating*. If an individual preferred downward comparison information, the inference to be drawn was that she would affiliate with worse-off others in order to obtain it (Buunk et al., 1991). However, affiliation may serve also the function of self-improvement. Others'

good fortune contains a *good-news* element about oneself in the future and may give one the confidence and inspiration necessary to start an improvement plan. It is likely that these purposes are best served by the affiliation with better-off others.

Following this line of thought and given the possible asymmetric effect of comparisons, if people choose to affiliate with worse-off others in order to obtain *self-enhancing* information, in the presence of downward comparisons, the negative influence from an improvement in others' resources on subjective well-being should be even more negative for those with more social contacts. Alternatively, affiliations with better-off others and self-improvement motivations would drive to a positive correlation between others' resources and individual well-being, but larger for those with more interpersonal relationships.

Although this aspect of social comparison process has not been extensively studied in economics, theoretical and empirical research from social psychology suggests that under the same psychological conditions, different types of comparison activity show divergent patterns and therefore may be differentially responsive to different psychological needs (Buunk et al., 1991). In particular, Taylor and Lobel's (1989) analysis shows that in certain groups under threat[40], there is a strong preference to evaluate the self against less fortunate others (downward evaluations) but a desire for information about and contact with more fortunate others (a pattern they label upward contacts).

Regarding the evidences from happiness economics and social psychology research, this chapter analyzes the distinctive effect of relative resources on individual satisfaction for those who have an active participation in social relationships and those who do not. In order to identify these possible differences, the effect of interpersonal relationships with similar others (relatives and friends, frequently called *bonding* social relationships), and participation in social heterogeneous networks (frequently called *bridging* relationships) is considered separately. A priori, we assume that individuals

[40] Using the findings from a previous study, Taylor and Lobel (1989) argue that individuals under a threat are faced with the two major coping tasks of regulating emotions and obtaining relevant problem-solving information and inspiration. To meet these goals individuals will make use of cognitive comparisons to worse-off others, but seek information about and contact with persons better off than themselves (Buunk et al. 1991).

that take part in more heterogeneous social relations have to their disposition the necessary information to realize upward and downward comparisons that determines the degree of exposure of the individual to social comparisons[41].

To sum up, in this chapter we seek to identify the effect of interpersonal relationships and relative resources conditions on subjective well-being. In particular, the first aim of this chapter is to examine resources *comparison effects* on subjective well-being. We test whether individual welfare depends on the individual's resources and the external benchmark given by some peers' resources. Besides, we also investigate whether this external influence is asymmetric, which means whether it differs for individuals above and below the reference level of resources of their peers. The second aim is to study the social influence from interpersonal relationships as generator of social capital and provider of relational goods. Uhlaner (1989) and Gui and Sugden (2005) called these type of goods *relational* given that they can only be produced, consumed or acquired from the interaction with other individuals and are enjoyed only if shared with others[42]. The third aim, and the main contribution of this chapter, is to investigate the interrelation between the two mentioned social influences. If we hypothesize that an individual derives well-being from the relational goods produced in the interaction with others, it is likely that this interaction has also an impact on the intensity of the externality produced by others' resources on her subjective well-being. Then, as a further analysis, we test whether social relationships serve as enhancer or appeaser of the effect of wealth comparisons on individual subjective well-being.

Our findings suggest that the effect of others' wealth on individuals' satisfaction in Latin American countries is positive and asymmetric, in contrast with

[41] Taylor and Lobel (1989) borrow the upward-downward distinction applied to explicit self-evaluations. Upward contacts may be defined as a preference to interact with or to gain information about individuals who are slightly or much better off, and downward contacts may be defined as a preference to interact with or gain information about others who are worse off.

[42] Relational goods are generated by social interactions (Gui and Sugden, 2005; Bruni and Stanca, 2008). Bechetti et al. (2008) include in the definition of relational goods: companionship, emotional support, social approval, solidarity, a sense of belonging and of experiencing one's history, the desire to be loved or recognized by others etc. They, and others researchers affirm that these goods are, on a smaller scale, produced by family relationships or friendships and, on a larger scale, in many kinds of social events (club or association meetings, live sport events, etc.)

most of the previous literature for developed economies, and even for some studies for Latin America (Graham and Felton, 2006). In our sample, it seems that information about others' situation may enter the representation of one's own future, for example, resulting in assimilation rather than contrast effects (Schwarz and Strack, 1999), in line with the findings in Russia (Senik, 2004), South Africa (Kingdon and Knight, 2007; Bookwalter and Dalenberg, 2010) and Eastern European countries (Senik, 2008; Caporale et al., 2009). Regarding interpersonal relationships, b*onding* and *bridging* social connections are among the strongest correlates of individuals' subjective well-being in Latin American countries, in terms of magnitude and statistical significance. Finally, our findings suggest that social contacts may enhance the wealth comparisons effect on individual's happiness mainly for those with an own wealth below of that in their reference group.

The plan of the present chapter goes as follows. In the next section, we review important hypotheses with reference to the determinants of individual subjective well-being. The data and the variables used in the study are described in the subsequent part. We proceed to explain the method of analysis. Then, the results from our analysis are presented and discussed. The final section summarizes the main conclusions.

6.2. Hypotheses.

As pointed out in the introduction, the main of this chapter is to analyze the joint influence of social comparisons and social capital on individual subjective well-being. In line with the related literature, we assume that a standard well-being function can be written as follows:

$$SWB_i = SWB(y_i, f(y_r), SC_i; X_i)$$

where y_i represents individual i's resources; $f(y_r)$ measures the distance between individual's own and the reference group resources, which can be interpreted as the individual's relative resources; SC_i represents a set of relational goods referred to individual's social ties and active involvement in individual volunteering activities; and X_i describes individual's socio-economic characteristics that have been previously identified in the literature as usual correlates of individual self-assessed well-being.

Although the importance of the individual's relative resources and social ties on subjective well-being has been widely analyzed in previous literature, the interaction between these two kinds of social influences is not much studied. The contribution of this chapter is to analyze these two factors and their interaction as determinants of individual's well-being. Our main interest is to investigate whether social capital serves as enhancer or mitigator of the effect of resources comparisons.

However, under this approach, it is not possible to make a systematic analysis integrating the joint influence of others' resources and social capital on well-being. Then, in order to test the interaction effects, and similar to the approach used by Luttmer (2005), we also consider a subjective well-being function that brings these two factors together:

$$SWB_i = SWB(y_i, SI_i; X_i)$$

where SI_i characterizes individual's social interactions, describing the join effect of $f(y_r)$ and SC_i, as social aspects that influence well-being.

Regarding these factors, we present some hypotheses that are commonly considered.

- *Resources Hypothesis.* This hypothesis, as in Chapter 5, assumes that individual's subjective well-being is influenced positively by her economic own material circumstances. In related literature the individual's resources are usually measured by income (Blanchflower and Oswald, 2004a; Ferrer-i-Carbonell, 2005), expenditure (Bookwalter and Dalenberg, 2010), or wages (Tao and Chiou, 2009), and less frequently by wealth (Graham and Pettinato, 2001; Graham and Felton, 2005, 2006). See Chapter 3 for a detailed summary of related literature on this hypothesis.

- *Relative Standing Hypothesis.* This hypothesis relies on the individual's relative resources. It suggests that how individuals' feel about their material conditions depends on their own resources as well as on the resources of others in their reference group (y_r). Thus, the well-being of the person i depends on the gap

between her own and others' material circumstances. As mentioned in previous section, there are evidences about two types of resources *comparison effects*. One related to the standard *status* or *envy* feelings (Clark et al., 2008), which implies that exposure to someone who is worse off (better off) will result in more positive (negative) self-assessed well-being. Alternatively, information about others' situation may enter the representation of own future producing *ambitions* or *signal* effect (in Lora (2008) this effect is called *solidarity*), influencing individual's well-being positively (Caporale et al., 2009; Clark and Senik, 2010; Kingdon and Knight, 2007; Senik, 2004). Relying on these previous evidences, individual's relative standing in her reference group might lead to an ambiguous effect on subjective well-being, given that the better an individual is in comparison with others, the happier she will be or just the opposite, depending of the net effect between *status* and *signaling* influences. Additionally, we consider as in previous literature, the possibility of asymmetric effects (Ferrer-i-Carbonell, 2005) of the individual's relative standing on subjective well-being. Individuals below or above others' material circumstances can be affected differently by changes in their relative position. At this respect, the magnitude of others' resources effect on individual subjective well-being is hypothesized to be stronger for individuals relatively poor (those below the average) than for relatively rich (those above the average), such as it is suggested by Ferrer-i-Carbonell (2005). An extensive analysis about this hypothesis is carrying on in Chapter 7.

- *Social Capital Hypothesis.* The evidence of cross-sectional studies from sociology and economy shows that individuals with active interpersonal relationships tend to be happier with their lives. This hypothesis assumes that social support and social networks generate relational goods producing powerful positive influences on individuals' subjective well-being. Empirical studies about social capital make a distinction between *bonding* (closed networks) and *bridging* (crosscutting ties) social capital, where *bridging* associations are identified as more likely to generate positive externalities than *bonding* associations, in terms of collective good of citizens (Woolcock and

Narayan, 2000; Marshall and Stolle, 2004). Additionally, evidence suggests also that individuals receive social support mostly from *bonding*[43] rather than *bridging* social ties (Helliwell, 2001; Helliwell and Putnam, 2004). In this work, we distinguish the influence of *bonding* and *bridging* social relationships on subjective well-being, and we expect a positive effect from both.

- *Social Interactions Hypothesis*. This hypothesis combines the two previous hypotheses, based on the idea that changes on others' material conditions can influence individual's subjective well-being in a different extent depending on the exposure to social interaction, i.e. the frequency and/or the intensity of her social relationships. This idea appears for example in Stutzer (2004), Luttmer (2005) and Clark and Senik (2010). In the two first studies a negative influence of others' resources on well-being was found, and this negative effect were stronger for those with more contacts with their neighbors, possibly since this makes resources differences with others more salient. The psychological literature is also relevant at this respect (see for a review Schwarz and Strack, 1999). Social psychology research (e.g. Festinger, 1954; Schachter, 1959) has shown that evaluation against a less fortunate other may be *ego-enhancing*, but frequent contact with such people may also be depressing and frightening. For an individual who prefers downward comparison information, we may expect that she would affiliate with worse-off others in order to obtain that information (Buunk et al., 1991). However, affiliation may serve also the function of self-improvement. Good news about others may give one the confidence and inspiration necessary to start an improvement plan. Therefore, from a theoretical viewpoint, we cannot unequivocally say whether social relationships act as an enhancer or mitigator of the effect of resources comparisons on individual's well-being. It is precisely this impact that will be the focus of our empirical investigation. In order to identify the possible differences between those who have an active participation in social relationships and those who do not, we distinguish between the effect of

[43] People who have close friends, confidants, friendly neighbors and supportive coworkers are less likely to experience sadness, loneliness and low self-esteem (Helliwell and Putnam, 2004).

contact with similar others (relatives and friends, labeled *bonding* social relationships), and participation in heterogeneous networks (*bridging* relationships). It is assumed a priori that individuals that take part in more heterogeneous social relations have access to the necessary information to realize upward and downward comparisons.

- *Socio-economic Hypotheses:* These hypotheses, as in Chapter 5, are based on the empirical regularities from previous studies. Such as it was exposed in the preceding chapter, we consider gender, age, marital status, education, labor market status, ethnicity and city size effects on individuals' subjective well-being.

6.3. Data and Variables.

6.3.1. Data.

The empirical analysis is based on a representative survey in eighteen Latin American and Caribbean countries, which was designed and collected by the Latinobarómetro organization 2007 (Latinobarómetro, 2007a, 2007b, 2009). In addition to the standard demographic and socio-economic variables already presented in the Latinobarómetro data set, the survey from the year 2007 includes information about individuals' self-evaluation of their satisfaction with diverse aspects of their life. More detailed description of this data set is presented in Chapter 4.

The survey consists of 20212 observations, with approximately 1000 - 1200 interviews for each country. We exclude from our analysis those for whom we lack some information about their demographic or socio-economic characteristics. Thus, our final sample covers information about 17670 individuals from the eighteen countries included in the dataset. These countries are: Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Honduras, México, Nicaragua, Panamá, Paraguay, Perú, Uruguay and Venezuela. The entire

survey is treated as a large region-wide sample with the weights[44] assigned in the whole dataset for each individual and country.

6.3.2. Variables.

Definition of Subjective Well-being

The Latinobarómetro data set for year 2007 provides different measures of subjective well-being. Respondents in the Latinobarómetro are asked about their satisfaction with their life, job, free time, housing, household income and neighborhood, among others individual and social aspects[45]. The survey includes a question about life satisfaction with four options range from *very satisfied* to *not at all satisfied*. Although we used the information from this question in the previous chapter, given that our aim in the present study is the analysis of interactions, that question poses an empirical problem. As it is shown by Norton et al. (2004), the interpretation of the interaction terms in linear regression models does not extend to non linear regression models and the computation of the marginal effects and the statistical significance of the parameters in the latter case involve an additional difficulty.

Nevertheless, Ferrer-i-Carbonell and Frijters (2004) and van Praag and Ferrer-i-Carbonell (2004) have shown that the results using ordered logit or probit models are surprinsigly close to the result of a simple OLS when the dependent variable ranges in a large scale. That is, the sign of the coefficients are the same; whether a coefficient is significant is the same; and the trade-offs between variables are roughly the same, which means that indifference curves are similar. Ferrer-i-Carbonell (2005) suggests that the larger the scale, the more precise is the measure of individual well-being.

[44] In Dominican Republic, El Salvador, Guatemala, Honduras and Nicaragua the sample is weighted with respect to stratum; in Chile is weighted with respect to age, sex, educational level and geographical area; in Argentina with respect to sex and age; in Colombia with respect to age, sex, educational level and size habitat; in Paraguay with respect to type of area and, in Venezuela is weighted with respect to sex and educational level. In Bolivia, Brazil, Costa Rica, Ecuador, Mexico, Panama, Peru and Uruguay the sample is not weighted. More details also are provided by the Methodological Report (Latinobarómetro, 2009).

[45] For instance, the way the economy works in their country, the public safety, the democracy, the healthcare, the education and the public spaces to which they have access, among other things.

Fortunately, the Latinobarómetro 2007 also includes a life satisfaction question that ranges from 0 to 10, and so we can use it in order to exploit its ordinal and cardinal features and to estimate OLS (Ferrer-i-Carbonell and Frijters, 2004). Then, in this work, given our purpose, we use the information about the individuals' self-assessed life satisfaction (*LS*) that comes from the following question: "*Could please tell me on a scale from 0 to 10, where "0" means you are "very dissatisfied" and "10" means you are "very satisfied". How satisfied are you with your life has turned out so far?"*. The non response rate to this question is less than 2%. There is a fair amount of variation in the answers, with a mean reported life satisfaction of 5.91 and a standard deviation of 2.20. Table 6.1 reports the main descriptive statistics of our dependent variable.

------- Insert Table 6.1 about here -------

Definition of Explanatory Variables

In order to test the *Resource Hypothesis,* we include the variables *Wealth* and *Food*, such as they were described in Chapter 5. Table 6.2 presents the main descriptive statistics of the variables used.

------- Insert Table 6.2 about here -------

To model the idea behind *Relative Standing Hypothesis* we consider that the well-being of an individual i depends on the gap between her own (y_i) and others' wealth (y_r). This gap is included in the subjective well-being function in two different ways. In the first alternative, we consider ($y_i - y_r$), the distance between individual's own and the reference group's wealth. In the second alternative we want to capture the asymmetric effect described in Ferrer-i-Carbonell (2005), that is, individuals below and above the reference wealth can be affected differently by changes in their relative standing. Then, we define I_1 and I_2

$$I_1 = \begin{cases} y_i - y_r & \text{if } y_i \geq y_r, \\ 0 & \text{if } y_i < y_r. \end{cases} \qquad I_2 = \begin{cases} y_r - y_i & \text{if } y_i \leq y_r, \\ 0 & \text{if } y_i > y_r. \end{cases}$$

where I_1 and I_2 measure how wealthier (I_1) or how poorer (I_2) the individual is with respect to her reference group's wealth.

The reference wealth of an individual is defined as the average wealth of the reference group, which is $\bar{y}_r = \left(\frac{1}{N_r}\right)\sum_i y_i$, where *i* are the individuals who belong to the same group and N_r the number of individuals considered. The present study follows previous literature and characterizes reference groups depending on some geographical and socio-economic characteristics that shall be described later on. The used procedure generates between 50 and 65 different reference groups by country, given that there are particular characteristics that do not overlap in some countries. Note that, as it is standard in most of the empirical work, the reference group is assumed to be exogenous. Under this definition of the reference wealth, relative wealth defined as $(y_i - \bar{y}_r)$ ranges between -6.49 and 10 with a mean of 0.28. In the same way, the variable I_1 varies between 0 and 10 with a mean 0.87, and the variable I_2 ranges between 0 and 6.49 with a mean of 0.59.

Respondents in the Latinobarómetro also are asked about how often they meet with friends and relatives (besides normal activities) and about their active membership in: a political party; a professional association[46]; a church or other religious organization; and/or a sports, leisure or cultural group. Then, as suggested by Beugelsdijk and Smulders (2003) and Sabatini (2006), to test the *Social Capital Hypothesis,* we use the information about the frequency of contacts with friends and relatives to construct the variable *SC-Bonding,* which is a dummy variable equal to 1 if the respondent meets with friends and relatives at least once a month[47], and 0 otherwise, such as it has been used in previous literature (Luttmer, 2005). On average, 70% of respondents in our sample meet with friends and relatives at least once a

[46] The corresponding question asks whether the individual belongs to a trade union business or professional association.

[47] The options to the question are: never, less than once a month, once a month, several times a month, once a week, several times a week, and every day.

month. The empirical approximation to *bridging* social relationships is made in two distinct ways. In the first approach, membership and active participation[48] in political, labor, religious, sports or leisure organizations are considered in a separated way, in order to test the positive influence of each of them on individual's well-being. Then, we define the dummy variables *Political*, *Labor / professional*, *Religious*, and *Sport / leisure,* which are coded 1 if individual belongs and has an active participation in each kind of association. In our sample, 8% of the individuals participate in a political organization, 4% in a professional, 19% in a religious and 10% take part in a sport association. In the second approach, we define the variable *SC-Bridging*, which is a linear index constructed using individuals' answers about the membership to the mentioned association in the first option, with the analysis of principal components to derive the weights. The index ranges from 0 to 10 and in our sample its average value is 0.85. This alternative measure is useful when considering interaction effects between bridging social capital and other variables because it summarizes the information about bridging relationships in a single item.

The *Social Interactions Hypothesis,* our contribution, is modeled through the interaction terms for the variables that represent *Relative Standing* and *Social Capital* hypothesis. The incorporation of these interaction terms allows us to test the influence of *bonding* and *bridging* social capital as enhancers or mitigators of wealth comparisons, and whether these influences are different for wealthier and poorer people. In particular, we define:

- $(y_i - \bar{y}_r)$*Bonding:* This variable measures the gap between own and others' average resource for those who socialize with friends and relatives at least once a month.
- $(y_i - \bar{y}_r)$*NBonding:* equals to the gap between own and others' average resource for those visiting friends and relatives less than once a month.
- (I_1)*Bonding* and (I_2)*Bonding*: These variables value I_1 and I_2, respectively, if individual visits friends and relatives at least once a month.

[48] Individuals are classified as having a membership in each one of these associations if they choose (1) on the following 4-point scale verbal categories: (1) Belong and actively participate; (2) Belong but don't actively participate: (3) Used to belong but do not anymore; (4) Have never belonged.

- (I_1)*NBonding* and (I_2)*NBonding*: These variables value I_1 and I_2, respectively, if individual visits friends and relatives less than once a month.
- $(y_i - \bar{y}_r)$*Bridging*: This variable measures the interaction between the variables *SC-Bridging* and $(y_i - \bar{y}_r)$.
- (I_1)*Bridging* and (I_2)*Bridging*: These variables cover the interaction between the variables (I_1), (I_2) and *SC-Bridging.*

Although the descriptive of the variables covering social interactions hypothesis do not have a clear interpretation, as a preliminary clue on the nature of the relationship between subjective well-being, relative standing and social capital, Table 6.3 shows the descriptive statistics on the differences in life satisfaction between individuals who socialize frequently and those who do not regarding relative wealth.

------- Insert Table 6.3 about here -------

There are significant differences[49] between individuals' life satisfaction with and without *bonding* social relationships, for individuals with a wealth below the average of the reference group wealth, and also for those with a wealth above the average of the reference group. As pointed out in the description of the hypotheses, these differences might reflect a multitude of characteristics and they depend on the influence of social capital and relative standing on individual subjective well-being.

Finally, a set of socio-demographic variables are included to cover the regularities from the *Socio-Economic Hypothesis* using most of the variables, such as they were defined in Chapter 5*.* Given that in the present work we consider a larger sample that the one used in the preceding chapter, the descriptive statistics have slight variations. As it was already mentioned, all the descriptive statistics are presented in Table 6.2. Definitions of the variables used are given in the appendix A.

Constructing the Reference Group

[49] The test of equality of means was rejected in all the cases with a p value lower than 0.01.

As mentioned, the present study follows previous literature and characterizes reference groups depending on geographical and socio-economic characteristics[50]. We build the groups of relevant others based on age bracket, education level and the size of the city that respondents live within a country. The categories for the educational level and city size are used such as they were defined in Chapter 5 as socio-economic characteristics. The age brackets are: 16-25, 26-35, 36-45, 46-65 and 66 or older[51].

Based on the availability of information, other group-formation criteria shall be also explored. First, it considers city size and educational attainment as the criteria to build the comparison group. Second, it groups individuals in the same country and similar education and age. Finally, given their country and city of residence, individuals with the same occupational status are considered a comparison group. The results of the analysis considering these reference groups shall be presented in the appendix.

6.4. Empirical Model.

As described in Chapter 2, the response of the individual i to the subjective well-being question LS_i is modeled as a manifestation of the latent and continuous variable LS_i^*. In line with previous literature, we assume that each individual makes an evaluation of her satisfaction with life LS_i^*, and classifies it under one of the categories to her disposition. Given the ordinal nature of our dependent variable, these choices are usually modeled assuming that the underlying subjective well-being LS_i^* is a linear function of a set of observable (Z_i) and unobservable factors (ε_i) as $LS_i^* = Z_i\beta + \varepsilon_i$. If

[50] Under this methodology, some papers have hypothesized that comparisons are made with respect to neighbors, the inhabitants of the geographical area where the respondent lives (Ferrer-i-Carbonell, 2005; Blanchflower and Oswald, 2004a; Luttmer, 2005). Certain authors elicit colleagues or people exerting the same profession as being the relevant others, in particular concerning job satisfaction (Clark and Oswald, 1996; Brown et al., 2008; Senik, 2004). Others consider other characteristics to construct the reference groups. For example, McBride (2001) includes in the reference group of each individual all people in USA who are in the age range of 5 years young and 5 years older than the individual concerned; Van de Stadt et al. (1985) define the reference group according to education level, age, and employment status; Ferrer-i-Carbonell (2005) assumes that those individuals living in the same region, with similar education level and inside the same age bracket belong to the same reference group.

[51] The variables used to construct the reference groups are also included in the econometric analysis that incorporates reference wealth. As Ferrer-i-Carbonell (2005) argues, it is assumed that these characteristics have two effects, namely a pure effect, and through creating the individual reference group.

the random term ε_i is assumed to be normally distributed, then we should use an ordered probit model in our empirical approximation.

Under a cardinal approach the numerical evaluations specified by the respondent are assumed to be comparable in magnitude. This means that somebody who answers '4' is half as satisfied as somebody who answers '8' (van Praag and Ferrer-i-Carbonell, 2004). If the individual responses to the subjective well-being question are considered ordinal, just the order of the numbers in a satisfaction scale is known but not the magnitude of the differences. However, this distinction turns out to be not relevant at the empirical level, given that linear and ordered categorical models yield very similar results in terms of trade-offs between variables (Ferrer-i-Carbonell and Frijters, 2004).

In this work, as mentioned, in order to obtain a clear interpretation of the interaction terms (Norton et al., 2004) included in our regressions, we consider the individuals' responses to the life satisfaction question as cardinal. Hence, we use OLS estimations to test our hypotheses. We adjust six different regression models. Given that our main interest focus on the influence of social interactions on individual's well-being, we start from the benchmark model, where only *relative standing* variables are included, to a model that also consider *social capital* influences, and proceed to deem a model where all the identified *social interaction* terms are considered. In Model A individuals' life satisfaction is described by:

$$LS_i^* = \alpha + \varphi y_i + \beta(y_i - \bar{y}_r) + \gamma X_i + \tau C + \varepsilon_i \qquad \text{(A)}$$

where y_i represents individual's resources, X_i includes individual's characteristics, $(y_i - \bar{y}_r)$ measure the comparison resources effect, C counts for country fixed effects, and ε_i is an error term. Notice that, there are prior hypotheses we are willing to test: the first coefficient (associated to the variable *Wealth*) in the vector φ is expected to be positive, and the second one (*Food*) negative. There is an ambiguous expected sign for β, because given the standard *envy* feelings the effect can be positive $(\beta > 0)$. Namely, the richer an individual is in comparison with others $y_i > \bar{y}_r$, the happier she will be (Ferrer-i-Carbonell, 2005; Luttmer, 2005). Similarly, if $\bar{y}_r$ is larger than y_i, then the larger the difference, the unhappier the individual will be. However, because the

signal effect (Caporale et al., 2009; Kingdon and Knight, 2007; Senik, 2004), we also can find just the opposite ($\beta < 0$).

In order to analyze whether the effect of the relative position on individuals' subjective well-being is asymmetric we propose Model B, which incorporates the variables I_1 and I_2 as an alternative to test the *Relative Standing Hypothesis*. These variables measure how wealthier or how poorer is the individual with respect to her reference group's mean wealth.

$$LS_i^* = \alpha + \varphi y_i + \beta_1 I_1 + \beta_2 I_2 + \gamma X_i + \tau C + \varepsilon_i \quad \text{(B)}$$

The effect of the variable I_1 on individual's subjective well-being (in absolute terms) is expected to be smaller than the effect of the variable I_2: $|\beta_1| < |\beta_2|$. Even from some prior literature if it is assumed that wealthier people is not influenced by the others' resources, which would mean that $\beta_1 = 0$.

We also proposed Models C1, C2, D1 and D2 which incorporate to Models A and B the variables associated to the *Social Capital Hypothesis*.

$$LS_i^* = \alpha + \varphi y_i + \beta(y_i - \bar{y}_r) + \beta_3 \textit{SC-Bonding} + \beta_4 \textit{Political} + \beta_5 \textit{Labor/professional}$$

$$+\beta_6 \textit{Religious} + \beta_7 \textit{Sport/leisure} + \gamma X_i + \tau C + \varepsilon_i \quad \text{(C1)}$$

$$LS_i^* = \alpha + \varphi y_i + \beta_1 I_1 + \beta_2 I_2 + \beta_3 \textit{SC-Bonding} + \beta_4 \textit{Political} + \beta_5 \textit{Labor/professional}$$

$$+\beta_6 \textit{Religious} + \beta_7 \textit{Sport/leisure} + \gamma X_i + \tau C + \varepsilon_i \quad \text{(C2)}$$

In Models C1 and C2 we include the variables *SC-Bonding* and the information about individual's participation in political, labor, religious, sports or leisure organizations is considered in a separated way, in order to test the positive influence of each of them on individual's well-being. In the Models D1 and D2, we include the variable *SC-Bridging*, which groups in a linear index the information about the individuals' membership in these organizations.

$$LS_i^* = \alpha + \varphi y_i + \beta(y_i - \bar{y}_r) + \beta_3 \textit{SC-Bonding} + \beta_8 \textit{SC-Bridging} + \gamma X_i + \tau C + \varepsilon_i \text{ (D1)}$$

$$LS_i^* = \alpha + \varphi y_i + \beta_1 I_1 + \beta_2 I_2 + \beta_3 \textit{SC-Bonding} + \beta_8 \textit{SC-Bridging} + \gamma X_i + \tau C + \varepsilon_i \text{ (D2)}$$

To test whether *social capital* is an enhancer or mitigator of wealth comparisons, we propose Models E and F. In Model E we explore the difference in the effect of relative standing $(y_i - \bar{y}_r)$ on subjective well-being between those with and without active social relationships.

$$LS_i^* = \alpha + \varphi y_i + \lambda_1(y_i - \bar{y}_r)Socialize + \lambda_2(y_i - \bar{y}_r)Nsocialize$$

$$+\beta_8 SC\text{-}Bridging + \beta_9(y_i - \bar{y}_r)Bridging + \gamma X_i + \tau C + \varepsilon_i \quad (E)$$

If there is not statistical difference between λ_1 and λ_2, then it is said that the effect of the individual's relative position on subjective well-being does not depend on her bonding social relationships. In the same line, if β_9 is not statistically different from zero, then the influence of the individual's relative standing are not mediated by bridging social relationships. To test the effect of social ties as mediators of the influence of relative standing under asymmetries, we propose Model F.

$$LS_i^* = \alpha + \varphi y_i + \lambda_3(I_1)Socialize + \lambda_4(I_1)Nsocialize$$

$$+\lambda_5(I_2)Socialize + \lambda_6(I_2)Nsocialize + \beta_8 SC\text{-}Bridging$$

$$+\beta_{10}(I_1)Bridging + \beta_{11}(I_2)Bridging + \gamma X_i + \tau C + \varepsilon_i \quad (F)$$

In this case, we test the statistical differences between λ_3 and λ_4 to study the influence of I_1 on subjective well-being, and between λ_5 and λ_6 for the analysis of I_2. In Model F the influence of bridging social relationships as mediator of the relative standing effect on individual's well-being is tested with the inclusion of the variables $(I_1)Bridging$ and $(I_2)Bridging$.

6.5. The Empirical Results

We present the estimation results for our life satisfaction regressions models in Table 6.4. The analysis hereafter focuses on the coefficients associated to the *Relative Standing, Social Capital* and *Social Interactions* hypotheses. The sign and significance of the estimated coefficients of the variables corresponding to the *Resources* and *Socio-*

economic hypotheses are similar to the evidence from previous studies, and for all the estimated models, the results are very similar to those presented in Chapter 5. Individual's satisfaction is positively influenced by her level of resources and negatively by material deprivation. There is not gender effect on life satisfaction, evidence shows that satisfaction diminishes with age until to reach a minimum and then increases. Individuals separated, divorced or widowed are less satisfied with their lives than single individuals, in line with the evidence form developed countries (Blanchflower and Oswald, 2004b; Helliwell, 2003: Wildman and Jones, 2002). The most outstanding result is the highly significant effect of primary incomplete education level on well-being compared with being illiterate, by showing that having the ability to read and to write makes a difference on life satisfaction. Among the variables of labor status being unemployed has a significant and negative influence on life satisfaction, which is in line with previous studies (Blanchflower and Oswald, 2004a; Clark and Oswald, 1994; Winkelmann and Winkelmann, 1998). While research for European countries and the US have found differences between blacks and whites' satisfaction with life (Blanchflower and Oswald, 2004a), no differences were identified between the different ethnic groups considered. Regarding the size of the city of living, respondents are more satisfied in small cities than in big ones.

------- Insert Table 6.4 about here -------

The results for the first specification, Model A, in which *Relative Standing* hypothesis is considered as the difference between the respondent's wealth and the average reference wealth plus the control variables, is given in the first column of Table 6.4. The evidence shows that for countries in our sample, the effect of the individual's relative wealth $(y_i - \bar{y}_r)$ is negative, in contrast with most of the prior empirical studies for developed countries (Ferrer-i-Carbonell, 2005), although it is in concordance with the evidence found in less developed countries (Caporale et al., 2009; Kingdon and Knight, 2007; Senik, 2004). The negative and significant coefficient associated to relative wealth means that, controlling for individual's own wealth, the larger the average wealth of her reference group, the higher the level of her satisfaction. In this case, this effect is associated with the value of the information about others' good news: a rise in the wealth of a colleague (Clark et al., 2009), for

example, is likely to create positive expectations about the own future, rather than an evaluation for our own economic standing.

Results from Model B in the second column of Table 6.4 suggests that this *information* or *signal* effect is non symmetric, being larger, in absolute value, for individuals below the average reference wealth, than for those above the reference wealth. This is in line with the Ferrer-i-Carbonell's (2005) findings for Germany and the theoretical suggestion of Duesenberry (1949), although with the opposite sign. Given the information that we use in the construction of our wealth index, this positive effect of the variable I_2 on individuals' subjective well-being can also be interpreted as a positive externality since that a higher cohort wealth may be correlated with higher quality public goods and higher levels of public health and safety, such as it was suggested by Bookwalter and Dalenberg (2009).

The inclusion of the variables associated to the *Social Capital* hypothesis in Models C and D does not influence the sign or the significance of the estimated coefficients regarding our *Relative Standing* hypothesis (β and β_1, β_2). Estimation results in models C1, C2, D1 and D2 confirm the *Social Capital* hypothesis. Visiting friends and relatives at least once a month and engaging in social organizations[52] increase individuals' life satisfaction. In line with previous studies, the results from Latin American countries suggests that *bonding* and *bridging* social connections are among the strongest correlates of subjective well-being in terms of magnitude and significance of the estimated coefficients (Helliwell and Putnam, 2004).

The last two columns of Table 6.4 present the estimation results for Models E and F, which consider interaction terms. The aim of these models is to test whether there are differences in the effect of relative standing depending on the level of individual socialization. With the exception of individuals above the reference wealth, an improvement on the reference group's wealth is associated with a higher life

[52] Correlation between the variables associated to social relationships in any case is not higher than 0.30, dropping the risk of multicollinearity in the estimation.

satisfaction and more for people with active social relationships[53]. These differences are not significant in Model D, where the influence of relative standing on individuals' well-being is assumed to be the same for those above and below the reference group's wealth.

That evidence, however, should be considered carefully, because according to the estimation results from Models B, C2 and D2, we find that the estimated effect of relative wealth on subjective well-being is non-symmetric, and is close to zero for those who have a wealth above the average in their reference group. In Model F, we include the interaction between social relationships and relative standing regarding these asymmetries in comparisons. Results from this last model indicates that, for individuals above the average wealth in the reference group, relative standing matters more for those who visit friends and relatives at least once a month, than for those who do not. It is possible that, for wealthy people who socialize more, the negative feelings from a decrease in their relative standing compensate the *information* and *signal* effects, because socialization make the reference wealth more salient. The same interpretation can be applied in the case of the non significant estimated coefficient of the interaction variable $(I_1)Bridging$.

The results show that for people below the average reference wealth, interaction between *bonding* social relationships and reference wealth is positive and significant. The statistical difference between λ_5 and λ_6 suggests that this influence is larger for individuals who visit frequently friends and relatives than for those who do not. For poor members of the group, reference wealth play an informational role about the own perspectives and they derive a positive well-being from a rise in others' wealth. This evidence is consistent with the well known tunnel effect that was early proposed by Hirshmann and Rothschild (1973) to refer to the individual's gratification from the advances of others.

Participation and affiliation with people in crosscutting networks serve the function of self-improvement for individuals below the average reference wealth. In

[53] Similar results are found when reference groups are built with other criteria. Estimation results for Models E and F under other reference groups are presented in Table C1. The p values for the test of equality of coefficients associated to the social interaction variables are presented in Table C2.

line with social psychology research, others undergoing a similar experience may provide one with information about how to improve one's status, as well as serve as a model for the coping process. For poor individuals, information about others in better conditions may give them the confidence and inspiration necessary to start an improvement plan. Similar findings in Senik (2004), using Russian data, has been justified by arguing that in the Russian economy, individuals take the reference income not as a comparison but as an information measure to create future expectations. Individuals who see richer people around them take this as a sign that their own material welfare may soon increases, which contributes to their happiness. This positive influence of others' wealth for poor individuals with active social relationships seems robust to the consideration of different reference groups. Additional estimations, where we consider alternative reference groups based on age and education, city size and labor status, city size and age brackets, are shown in Table C1 in the Appendix.

The evidence from Latin American countries shows that an improvement in others' material conditions generates positive externalities on the subjective well-being. In the case of the poor, the positive effect of bonding and bridging social contacts on subjective wellbeing is twofold. First, there is a direct effect that produce to belong and to participate in this kind of networks. Second, it seems to be an indirect effect as enhancer of the informational effect of comparisons.

6.6. Conclusions.

This chapter aimed to contribute to the literature by examining the determinants of satisfaction in Latin American countries using data from the Latinobarómetro Survey 2007, with special emphasis on how social influences affect subjective well-being. Social relationships and social comparisons have been considered important correlates of individual's satisfaction offering two different approximations and opposite effects on it. However, evidences from social psychology research have shown that these two items are highly linked, suggesting the importance of study social interaction process

as a whole issue that involve social comparisons and social contacts. This study has explored three different relationships between social influences and individual's subjective well-being. While *bonding* and *bridging* social relationships are positive correlated with individual's life satisfaction, comparisons with others' wealth are considered a source of dissatisfaction in most of the previous literature. In addition to test these evidences, the main novelty of this chapter has been to examine the importance of social contacts as enhancer or appeaser of the effect of social comparisons on individual satisfaction.

The main conclusions of this study can be summarized as follows: (1) In terms of magnitude and significance of the estimated coefficients, b*onding* and *bridging* social connections are among the most important correlates of individuals' subjective well-being in Latin American countries; (2) There is evidence of asymmetric wealth comparisons among people in a similar geographical area, age range and education level. Given the magnitude and the significance of the coefficients in the reference groups considered, the evidence points out the dominance of the *informational* or *signal* effects to *envy* effects, opposite to most of the literature postulates, but in line with the findings in Russia (Senik, 2004), South Africa (Kingdon and Knight, 2007) and Eastern European countries (Senik, 2008; Caporale et al., 2009); (3) Social contacts enhance wealth comparisons effect on individual's happiness. Considering the asymmetry of *comparison effects*, the evidence from the reference groups analyzed shows that for poor individuals interacting frequently with friends and relatives an improvement in others' wealth is perceive as a positive externality.

Membership in associations and crosscutting networks, frequently called bridging social capital is seen as a positive determinant of economic growth. Until now, the principal argument has been that bridging social networks promote trust and diminish the transaction cost facilitating economic activities. Following social psychology theory and the evidence found in the present chapter, it is possible to propose a complementary explanation. Considering our evidence, if bridging social networks are considered as source of information and motivation for less fortunate people, this behavior can also be considered a driving force behind economic growth.

Appendix A.

Description of the Explanatory Variables

Explanatory Variables	Description
Resources	
Wealth	Weighted linear index about the ownership of the following assets: television, refrigerator, own-house, computer, washer machine, cell phone, car, second house, running water and bathroom with shower. The weights are derived from the first principal component, and then it is rescaled from 0 to 10.
Food	Dummy variable: 1 if individual has run out of money to buy food at any time during the past 12 months; 0 otherwise.
Relative Standing Variables	
$y_i - \bar{y}_r$	Continuous variable equals to the distance between individual's own and the average reference group's *Wealth*.
I_1	Continuous variable equals to the distance between individual's own and the average reference group's *Wealth* if individual's *Wealth* is larger or equal than the reference group's average *Wealth*; 0 otherwise.
I_2	Continuous variable equals to the distance between the average reference group's *Wealth* and the individual's *Wealth* if individual's *Wealth* is smaller or equal than the reference group's average *Wealth*; 0 otherwise.
Social Capital Variables	
SC-Bonding	Dummy variable: 1 if individual visits friends and relatives at least once a month (daily, weekly or monthly); 0 otherwise.
SC-Bridging	Weighted linear index about membership in political, professional, religious or sports organizations. The weights are derived from the first principal component.
Political	Dummy variable: 1 if individual belongs and has a active participation in a political association; 0 otherwise.
Labor / professional	Dummy variable: 1 if individual belongs and has an active participation in a professional association; 0 otherwise.
Religious	Dummy variable: 1 if individual belongs and has an active participation in a religious association; 0 otherwise.
Sport/ leisure	Dummy variable: 1 if individual belongs and has an active participation in a sports or leisure association; 0 otherwise.
Social Interactions Variables	
$(y_i - \bar{y}_r)$Bonding	Continuous variable equals to $(y_i - \bar{y}_r)$ if the individual visit friends and relatives at least once a month; 0 otherwise.
$(y_i - \bar{y}_r)$NBonding	Continuous variable equals to $(y_i - \bar{y}_r)$ if the individual visit friends and relatives less than once a month; 0 otherwise.
(I_1)Bonding	Continuous variable equals to (I_1) if the individual visit friends and relatives at least once a month; 0 otherwise.
(I_1)NBonding	Continuous variable equals to (I_1) if the individual visit friends and relatives less than once a month; 0 otherwise.
(I_2)Bonding	Continuous variable equals to (I_2) if the individual visit friends and relatives at least once a month; 0 otherwise.

(I_2)NBonding	Continuous variable equals to (I_2) if the individual visit friends and relatives less than once a month; 0 otherwise.
$(y_i - \bar{y}_r)$Bridging	Continuous variable equals to the product between $(y_i - \bar{y}_r)$ and *SC-Bridging*.
(I_1)Bridging	Continuous variable equals to the product between (I_1) and *SC-Bridging*.
(I_2)Bridging	Continuous variable equals to the product between (I_2) and *SC-Bridging*.
Socio-demographic Characteristics	
Male	Dummy variable: 1 if male; 0 if memale.
Age	Age in years.
Age squared	Age to the squared.
Marital Status	
Single	Dummy variable: 1 if never married; 0 otherwise.
Married	Dummy variable: 1 if married; 0 otherwise.
Other	Dummy variable: 1 if separated, divorced or widowed; 0 otherwise.
Education	
Illiterate	Dummy variable: 1 if illiterate; 0 otherwise.
Primary-Incomplete	Dummy variable: 1 if primary incomplete; 0 otherwise.
Primary	Dummy variable: 1 if primary; 0 otherwise.
Secondary	Dummy variable: 1 if secondary; 0 otherwise.
University	Dummy variable: 1 if university; 0 otherwise.
Labor Market Status	
Employed	Dummy variable: 1 if employed in paid employment; 0 otherwise.
Self-employed	Dummy variable: 1 if self-employed; 0 otherwise.
Unemployed	Dummy variable: 1 if unemployed; 0 otherwise.
Inactive	Dummy variable: 1 if individual reports being a student, retired or housekeeper.
Self-reported Ethnicity	
Indigenous	Dummy variable: 1 if indigenous; 0 otherwise.
White	Dummy variable: 1 if white; 0 otherwise.
Mestizo	Dummy variable: 1 if mestizo; 0 otherwise.
Other	Dummy variable: 1 if asian, black, mulato and others; 0 when self-reported ethnicity is indigenous, white or mestizo.
City size	
MediumCity	Dummy variable: 1 if individual's town is with more than 10.000 inhabitants and is not capital city; 0 otherwise.
SmallCity	Dummy variable: 1 if individual's town is with less than 10.000 inhabitants; 0 otherwise.
CapitalCity	Dummy variable: 1 if capital city; 0 otherwise.

Appendix B

Table 6.1. Dependent Variable - Descriptive Statistics.

Dependent Variable	Mean/Proportion	St. Deviation	Min	Max
Life Satistaction	5.91	2.20	1	10
Very Dissatisfied (0-1)	0.03		0	1
2	0.03		0	1
3	0.07		0	1
4	0.10		0	1
5	0.22		0	1
6	0.17		0	1
7	0.13		0	1
8	0.12		0	1
9	0.04		0	1
Very Satisfied	0.08		0	1

The sample used comprises information from 17670 individuals with a valid life satisfaction.

Table 6.2. Explanatory Variables - Descriptive Statistics.

Explanatory Variables	Mean/Proportion	St. Deviation	Min	Max
Resources				
Wealth	5.76	2.33	0	10
Food	0.31	0.46	0	1
Relative Standing Variables				
$(y_i - \bar{y}_r)$	0.28	1.82	-6.49	10
I_1	0.87	1.15	0	10
I_2	0.59	0.99	0	6.49
Social Capital Variables				
SC-Bonding	0.70	0.46	0	1
SC-Bridging	0.85	1.64	0	10
Political	0.08	0.27	0	1
Labor / professional	0.04	0.20	0	1
Religious	0.19	0.39	0	1
Sport/ leisure	0.10	0.30	0	1
Social Interactions Variables				
$(y_i - \bar{y}_r)$*Bonding*	0.26	1.51	-6.49	10
$(y_i - \bar{y}_r)$*NBonding*	0.02	1.02	-5.77	7.57
(I_1)*Bonding*	0.64	1.05	0	10
(I_1)*NBonding*	0.23	0.71	0	7.57
(I_2)*Bonding*	0.38	0.84	0	6.49
(I_2)*NBonding*	0.20	0.65	0	5.89
$(y_i - \bar{y}_r)$*Bridging*	0.40	3.68	-47.41	55.13
(I_1)*Bridging*	0.86	2.97	0	55.13
(I_2)*Bridging*	0.46	1.97	0	47.41
Socio-demographic Characteristics				
Male	0.49	0.50	0	1
Age	39.54	16.20	16	94
Marital Status				
Single	0.30	0.46	0	1
Married	0.58	0.49	0	1
Other	0.12	0.32	0	1
Education				
Illiterate	0.10	0.30	0	1
Primary-Incomplete	0.21	0.41	0	1
Primary	0.34	0.47	0	1
Secondary	0.27	0.45	0	1
University	0.08	0.28	0	1
Labor Market Status				
Employed	0.26	0.44	0	1
Self-employed	0.32	0.47	0	1
Unemployed	0.05	0.21	0	1
Inactive	0.37	0.48	0	1
Self-reported Ethnicity				
Indigenous	0.09	0.28	0	1
White	0.28	0.45	0	1

Explanatory Variables	Mean/Proportion	St. Deviation	Min	Max
Mestizo	0.43	0.49	0	1
Other	0.20	0.40	0	1
City size				
MediumCity	0.70	0.46	0	1
SmallCity	0.14	0.35	0	1
CapitalCity	0.16	0.36	0	1
Sample size	17670			

Table 6.3. Life Satisfaction by SC-Bonding and Relative Standing.

		Average *LS* if	
	LS	$y_i < \bar{y}_r$	$y_i > \bar{y}_r$
SC-Bonding = 0	5.65	5.34	5.68
SC-Bonding = 1	6.03	5.93	6.26

Table 6.4. Life Satisfaction Estimation Results for Latinobarómetro 2007.

	Model A	Model B	Model C1	Model C2	Model D1	Model D2	Model E	Model F
Relative Standing								
$(y_i - \bar{y}_r)$	-0.070**		-0.068**		-0.069**			
	(0.028)		(0.028)		(0.028)			
I_1		-0.032		-0.033		-0.034		
		(0.030)		(0.030)		(0.030)		
I_2		0.123***		0.118***		0.119***		
		(0.034)		(0.034)		(0.034)		
Social Capital								
SC-Bonding			0.134***	0.135***	0.136***	0.138***		
			(0.037)	(0.037)	(0.037)	(0.037)		
SC-Bridging					0.103***	0.102***	0.106***	0.075***
					(0.010)	(0.010)	(0.011)	(0.017)
Political			0.218***	0.218***				
			(0.069)	(0.069)				
Labor / professional			0.286***	0.284***				
			(0.083)	(0.083)				
Religious			0.224***	0.222***				
			(0.046)	(0.046)				
Sport/ leisure			0.264***	0.263***				
			(0.057)	(0.057)				
Social Interactions								
$(y_i - \bar{y}_r)$*Bonding*							-0.070**	
							(0.029)	
$(y_i - \bar{y}_r)$*NBonding*							-0.056*	
							(0.031)	
(I_1)Bonding								-0.046
								(0.033)
(I_1)NBonding								-0.091**
								(0.037)
(I_2)Bonding								0.151***
								(0.038)
(I_2)NBonding								0.073*

	Model A	Model B	Model C1	Model C2	Model D1	Model D2	Model E	Model F
								(0.043)
$(y_i - \bar{y}_r)$*Bridging*							-0.003	
							(0.005)	
(I_1)Bridging								0.012
								(0.008)
(I_2)Bridging								0.027**
								(0.013)
Prob > F		0.003		0.006		0.005		
Resources variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Socio-economic variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	17670	17670	17670	17670	17670	17670	17670	17670

Standard errors in parentheses. * p<0.1, ** p<0.05, *** p<0.01. The resources and socio-economic variables are those described in Table 6.2. The p-value is for the test of the equality of the coefficients of I_1 and I_2: $|\beta_1| = |\beta_2|$.

Appendix C.

Table C1. Life Satisfaction and Social Interaction by Different Reference Groups.

Reference group by:	Age and Education		City and Labor Status		City and Age	
	Model D	**Model E**	**Model D**	**Model E**	**Model D**	**Model E**
Social Interactions						
$(y_i - \bar{y}_r)$*Bonding*	-0.032		-0.123***		-0.134***	
	(0.040)		(0.046)		(0.044)	
$(y_i - \bar{y}_r)$*NBonding*	-0.019		-0.105**		-0.127***	
	(0.042)		(0.047)		(0.046)	
(I_1)Bonding		0.002		-0.086*		-0.084*
		(0.042)		(0.047)		(0.045)
(I_1)NBonding		-0.044		-0.133***		-0.133***
		(0.046)		(0.051)		(0.049)
(I_2)Bonding		0.081*		0.176***		0.199***
		(0.046)		(0.051)		(0.050)
(I_2)NBonding		-0.009		0.081		0.115**
		(0.049)		(0.052)		(0.053)
$(y_i - \bar{y}_r)$*Bridging*	-0.005		-0.002		-0.006	
	(0.005)		(0.005)		(0.005)	
(I_1)Bridging		0.012		0.006		0.012
		(0.009)		(0.008)		(0.009)
(I_2)Bridging		0.030**		0.017		0.033**
		(0.012)		(0.013)		(0.013)
Resouces variables				Yes		
Socio-economic variables				Yes		
Country dummies				Yes		
Observations				1760		

Standard errors in parentheses. * p<0.1, ** p<0.05, *** p<0.01. The resources and socio-economic variables are those described in Table 6.2

Table C2. Testing Social Interaction Influences by Reference Groups.

	City, Age and Education		Age and Education		City and Labor Status		City and Age	
	Model D	**Model E**	**Model D**	**Model E**	**Model D**	**Model E**	**Model D**	**Model E**
$H_0: \lambda_1 = \lambda_2$	0.499		0.496		0.323		0.723	
$H_0: \lambda_3 = \lambda_4$		0.075		0.068		0.053		0.057
$H_0: \lambda_5 = \lambda_6$		0.021		0.006		0.002		0.013

7. Relative Concerns and Subjective Well-Being: Testing Relative Income Hypotheses.

7.1. Introduction.

Neoclassical economic models assume that people strive to maximize their utility, and that an individual's utility depends solely on the absolute level of her own consumption or income. However, given recent empirical work, nowadays there is an increasing acceptance that individuals' welfare is, not only determined by their own circumstances, but also depends heavily on their relative position in society (Duesenberry, 1949; Easterlin, 1995, 2003; Frank, 1999; Luttmer, 2005; Powdthavee, 2009; Wolpert, 2010) and/or their achievements in comparison with some benchmark. That benchmarks do not only depend on the present situation, but also on what the individual has experience in the past, on what she expects to experience in the future, and on what other people think and do (van Praag and Ferrer-i-Carbonell, 2004). So, it is possible to characterize two types of comparisons: (i) *internal benchmarks*, which involve aspirations and dynamic comparisons with one's own situation in different points of time, and (ii) *external benchmarks*, i.e. comparisons with some peers or relevant others, such as neighbors, co-workers, parents, etc. If preferences are characterized by relative concerns with such *external benchmarks*, then the observed widening of the income distribution may have implications on individual's happiness.

This chapter aims to contribute to this broad literature on subjective well-being and relative concerns by testing the importance of others' income distribution on individual's utility, using data from the German Socio-Economic Panel over the period 1992-2008. The main contribution of this study is the inclusion of different measures that try to cover the income distribution effect on individual's utility. We present five formulations of the relative concerns model of utility, going from the mean dependence model, that have been traditionally used (Boskin and Sheshinski, 1978; Abel, 1990; Clark and Oswald, 1996; Ferrer-i-Carbonell, 2005; Luttmer, 2005), to a novel and more general model that look at the whole distribution of others' incomes in the individual's reference group.

There is considerable evidence that people have a deep and general concern with their relative position within society and that they care as much about the level of income of others as their own (Frank, 1985, 1999; Clark et al, 2008). Studies that have included measures of relative income find that additional income may not increase happiness if those in the reference group –colleagues, neighbors, or friends – also gain a similar increase (Clark and Oswald, 1996; Frank, 1999; Luttmer, 2005). This is often referred to as the *comparison income* or *relative utility* effect.

Economic analysis of such *relative utility* effects (or more generally, interdependent preferences) can be dated back to at least Veblen (1899), with the concept of conspicuous consumption. He was one of the first who pointed out that individuals are affected by the economic situation of their peers. Following this line, Duesenberry (1949) explored the thesis that households care not only about their own consumption level, but also about their consumption level relative to those of other households in their reference group. Named the *demonstration effect*, the thesis is that a person suffers welfare loss when others' consumption levels rise, because her relative consumption now declines.

This argument found additional support in the widely cited *Easterlin paradox*. That paradox lies on the fact that as a robust and general result, it has been found that, at a given point in time, richer people are happier, on average, than poorer

people, while over time and in the long run, despite increases in income in developed countries, the average level of happiness has not increased significantly (Easterlin, 1974, 1995). The explanation behind that paradox suggests that if a general increase in national wealth does not make inhabitants of a country happier, it is because adaptation (Easterlin, 2001) and/or because individuals only value the relative progress in their personal income, compared to some relevant reference group. This is the well known effect *keeping up with the Joneses*. A number of studies (for a review see Clark et al., 2008) have followed this formulation of relative concerns, with the implication that Joneses' wealth or visible consumption may have a negative effect on the Smiths.

In the empirical analysis of relative concerns and subjective well-being there are two key issues. One is how to build the reference or comparison group in order to delimit who are the subjects of comparison. The second is how to model the *relative utility* effect; how the individuals do the comparisons. Regarding the first issue, in most of the applied literature that test the *comparison income* effect, the reference income is included in the happiness equation as the typical income of people *similar* (for example, people living in the same country or region, those with the same age or doing the same kind of job, etc.). Clark et al. (2008) summarize two different ways to calculate the reference group income. On the one hand, some researchers estimate wage equations and then compute the predicted income of someone with similar characteristics (age, sex, education, etc.). Clark and Oswald (1996) and Senik (2004) are examples of this procedure. Alternatively, other works use the *mean dependence framework* by computing cell averages by region, sex, education, etc.

Among those studies of the latter approach (that will be also ours), some papers have hypothesized that comparisons are made with respect to neighbors, the inhabitants of the geographical area where the respondent lives. The scope of the geographical reference varies, from being as large as East and West Germany (Ferrer-i-Carbonell, 2005) or American States (Blanchflower and Oswald, 2004a; Persky and Tam, 1990). Luttmer (2005) calculates the average income in the respondent's locality, combining the American Survey of Families and Households with the Census and the

Current Population Survey data. Graham and Felton (2006) replicate this by local areas across eighteen Latin American countries. Others consider other characteristics to construct the reference groups. McBride (2001), for instance, assumes the reference others based on the individual's age cohort (persons born five years before and after her). Van de Stadt et al. (1985) define the reference group according to education level, age, and employment status, and Ferrer-i-Carbonell (2005) defines individual's reference group based on region, age and education level.

Concerning the *comparison income* effect, with few exceptions (Kingdon and Knight, 2007; Senik, 2004, 2008), almost all the mentioned studies find that conditional to the own income, the average income of the reference group are negative correlated with the respondents' subjective well-being. Most of the existent evidence that documents the influence of others' average income on individual's well-being considers a symmetric comparison income effect. Meaning that the extent to which a change in the group's average income influence individual's well-being is similar for everybody. Using German data and assuming reference income as cell averages by region, age and education, Ferrer-i-Carbonell (2005) studies the effect of three forms of relative concerns on subjective well-being, two symmetric and one asymmetric. In the first, she includes average income as well as individual income. She finds that group reference income influence individual well-being negatively as in previous studies (Clark and Oswald, 1996; McBride, 2001). The second tests the effect of *relative income* as the difference between individual's own income and the average income of the reference group. Her evidence shows that the larger an individual's own income is in comparison with the income of the reference group, the happier the individual is.

Ferrer-i-Carbonell (2005) also tests for asymmetry of comparisons. She finds that poorer than average individuals in West Germany are adversely affected by the income of those around them, whilst richer than average individuals are not. This means, comparisons effects are asymmetric. However, the idea of asymmetry in comparisons is not new in the economic analysis. In the early work of Duesenberry

(1949) he argued that individuals are negatively influenced by the income of their peers above themselves in the income distribution, while the opposite does not hold, others' income below in the income distribution do not influence individual well-being. This means, people look upward when making comparisons. In this form, wealthier people impose a negative external effect on poorer people, but not vice versa. With a partial exception[54] (Blanchflower and Oswald, 2004a), we are not aware of an empirical test of Duesenberry's hypothesis of asymmetry in comparison using happiness data, basically because most of the research typically does not distinguish the effect on happiness of changes in incomes of those who are richer from the effect of changes in income of those who are poorer. As it has been exposed by Clark et al. (2008), the *mean dependence framework* - or cell average approach - relies on a subtle exclusion restriction that individuals compare themselves only to the average income within each cell, and it hinders us to identify the possible asymmetric effects of comparisons proposed by Duesenberry (1949). That is the gap we try to fill in the present chapter.

Recently, from behavioral economics have been proposed a model of inequity aversion (Bolton, 1991; Bolton and Ockenfels, 2000; Fehr and Schmidt, 1999), where it stipulates that individuals do not only care about their own outcomes, they also care about the distribution of outcomes among their society (see for a review Cooper and Kagel, 2009). In those models (Bolton and Ockenfels, 2000; Fehr and Schmidt, 1999) it is generally assumed that people have *compassion* toward others with lower outcomes[55] and *envy* toward those with higher outcomes. The inequity aversion model of Fehr and Schmidt (1999) is the best known. In intuitive terms, the idea is that individual utility may depend on the own absolute level of resources, the total weight

[54] The study of Blanchflower and Oswald (2004a) is a partial exception because they use the average level of income in each of the different quintiles of income within the person's state as comparison income, and find that the greatest effect on life satisfaction comes from those in the highest quintile income level. But the impact of the income of the poorest on others' happiness, though smaller in absolute size, has the opposite sign. Notice that Ferrer-i-Carbonell's (2005) approach assumes a different source of asymmetries. In her analysis she finds that the *comparison effect* differs for individuals above and below the average income in the group, but the assumption is that richer and poorer people compare themselves with the average in the reference group.

[55] The opposite is called *pride* or *downward envy* (Hopkins, 2008).

of resources above the own, and the total weight of resources below the own. Under this approach and by considering *compassion*[56] and *envy* effects, an individual might lose well-being or utility even if he or she is at the top of the relevant income distribution.

Close to the inequity aversion model, there is a measure proposed by Runciman (1966) and formalized by Yitzhaki (1979) which allow for the possibility that utility is differentially affected by the income distribution above and below the individual's income. This measure is called *relative deprivation* and has been recently used in health economics literature (see Deaton, 2003; Gravelle and Sutton, 2009). In his analysis, Runciman (1966) suggests that people compare themselves with some reference group within the society rather than with the whole society. He defines the degree of deprivation inherent in not having an specific characteristic – X – as an increase function of the proportion of persons in the reference group who have X. Yitzhaki (1979) considers income as the object of relative deprivation and defines the range of possible deprivation for each person in the reference group as $(0, y^{max})$, where y^{max} is the highest income existing in the reference group. For each person *i*, her own income y_i partitions the possible deprivation range into two segments: the range of income for which she is deprived, and the range of income for which she is satisfied (affluence in Deaton, 2003). The total deprivation assigned to a person is the sum of the deprivation inherent in all units of income she is deprived of (Yitzhaki, 1979, p. 322). The advantage of the incorporation of this type of measures in comparison with the *mean dependence* model is that only the former can accommodate individual differences in relative concerns with upward and downward comparisons.

In sum, while *mean dependence* models postulate that people care about the average level of income as well as their own personal level, the main contribution of this chapter is that we test relative concerns by using a model based on income differences between an individual and everyone else in the population (it can be interpreted as a version of the Fehr and Schmidt's model of inequity aversion). Where,

[56] A recent work by Blanco et al. (2011), using a set of games in an experimental setting, find that all the subjects in their experiment show *compassion* and not *pride*.

as it has been proposed by Friedman and Ostrov (2008), the *mean dependence* model can be understood as a particular case. Notwithstanding, in order to test the relative income hypotheses we also use the mean reference group approach as it has been presented in prior literature.

So, we try to go deeper by modeling the whole distribution of income in a reference group rather than its mean. We test whether the impact of other's income on individual happiness depends on the position of the other in the income distribution. Specifically, we test whether individual's utility is affecting in the same way when the income of a richer increases (decrease) and when the income of others poorer than the individual in her reference group increases (decrease). Further analysis explores the effect of distribution of income above and below the individual's own income and the possible heterogeneous effect across the distribution of happiness.

In line with previous literature, our results show that individual subjective well-being is affected by the income of others in their reference group. Our evidence suggests that there are two sources of asymmetries in the *comparison income effect*. First, we find that an increase in others' average income is associated with lower well-being for those whose income is below the average, while it does not have influence on the well-being of the individuals with an income above the average in the reference group. As to the second asymmetric effect, our evidence suggests that there are *envy* and *compassion* effects in the relationship between others' income and subjective well-being. We find that an increase in the income of someone richer than the individual has a negative influence on her well-being, while an increase in the income of someone poorer has a positive influence. In contrast with Ferrer-i-Carbonell's (2005) modelization of asymmetries of the *comparison income effect,* and given the results associated to the second source of asymmetries proposed in this chapter, changes in others' income can influence well-being even of those at the top of the income distribution.

The current chapter is structured as followed. Section 7.2 introduces, among other hypotheses, the formulation of the relative standing hypotheses jointly with the

questions that emerge with these formulations. Section 7.3 describes the dataset and the variables used in the analysis. Section 7.4 presents the empirical strategy. Section 7.5 exposes the main results. Section 7.6 present an extensive analysis based on the marginal probability effects and conclusions are set out in Section 7.7.

7.2. Hypotheses.

As pointed out in the introduction, this chapter aims to contribute to the literature on subjective well-being and relative concerns by testing the importance of others' income distribution. From a theoretical approximation a model of relative concerns on individual well-being can be written as follows:

$$SWB_i = SWB(y_i, f(y_{r,i}); X_i)$$

where i represents the individual, y_i represents the income of individual i, and $y_{r,i}$ represents the income of her peers. Being consistent with previous literature (see Chapter 3), we also add X_i describing other socio-economic factors that have been identified as usual correlates of individual's subjective well-being. We present some hypotheses derived from the related literature that shall be tested in this chapter. The contribution of this work is not the hypotheses in themselves, but the way in which we test those hypotheses, in particular the ones related to relative concerns.

- *Resources Hypothesis.* This hypothesis, as in Chapter 5 and 6, assumes that individual's subjective well-being is influenced by her economic own material circumstances. In related literature the individual's resources are usually modeled by income (Blanchflower and Oswald, 2004a; Ferrer-i-Carbonell, 2005), expenditures (Bookwalter and Dalenberg, 2010), or wages (Tao and Chiou, 2009), and less frequently by indexes of wealth (Graham and Pettinato, 2001; Graham and Felton, 2005, 2006). This hypothesis has also been studied as the *absolute income hypothesis* and states that the level of utility or well-being varies positively with the level of income up to a threshold level beyond

which utility remains largely invariant (Caporale et al., 2009). That idea is consistent with the assumption of diminishing marginal utility of consumption (or income) that the neoclassical economic theory states.

- *Symmetric Relative Standing Hypothesis.* This hypothesis relies on the idea that others' income influences on individual's subjective well-being. There are two common ways to study the influence of others' income. One is tested in the *model of mean dependence*. With some exceptions (Kingdon and Knight, 2007; Senik 2004, 2008), under this approach it is hypothesized that individual's well-being is negatively affected by the average income of others in her reference group (Clark and Oswald, 1996; McBride, 2001, Ferrer-i-Carbonell, 2005). The second usual alternative is the *model of relative income*, which assumes that individual's subjective well-being is influenced by an absolute and a relative component where one's own income is compared with the average income of the reference group (Clark et al., 2008). This relative component is hypothesized to influence positively an individual's well-being. The intuition is that the richer (poorer) an individual is in comparison with the average, the happier (unhappier) she will be (Ferrer-i-Carbonell, 2005; Dynan and Ravina, 2007).

- *Asymmetric Relative Standing Hypothesis.* As pointed out at the introduction, the effects of *relative income* can differ for individuals below and above average income (Ferrer-i Carbonell, 2005). So, relative concerns models need to consider that income comparisons are not symmetric. One the one hand, asymmetric comparison effects mean for example that, while the individuals' well-being are negatively affected by an income below the average income of their reference group, individuals with an income above the average of their reference group could not experience a positive impact on happiness or utility. However, the assumption that an individual's utility responses to comparison between the own and the mean income implies that an individual with a given income would feel as happy in a society with low inequality (low dispersion in

the income distribution) as in an economy with high inequality (high dispersion in the income distribution). Although, some models (Ferrer-i-Carbonell, 2005) consider the asymmetric effects of comparisons under this mean reference framework, this formulation is not useful to distinguish asymmetric happiness responses to incomes above and below the individual own income position. On the other hand, if we hypothesize that utility on each individual depends on the differences between that individual's income and those of others in the group and not only with respect to the average, we can address the effect of income comparisons considering the whole distribution of income in the reference group. Given previous evidences from behavioral economics (Cooper and Kagel, 2009; Fehr and Schmidt, 1999), we hypothesize that individual's utility is sensible to the distances in incomes and to the variance in the income distribution of those above and below her own income. Following related literature from behavioral economics we can label this model as a *model of inequity aversion*. This model captures the idea that the existence of incomes above you poses a threat, while incomes below you can be either costly, if you value fairness, or beneficial, if you derive pleasure from status associated with having more income than others (Deaton, 2003). Under this framework, a change in others' income can influence well-being, even for those at the top of the income distribution on the reference group. Regarding the empirical evidence from behavioral economics, we expect that larger distances between others' and the individual's own income exert a negative influence on her subjective well-being. Given that, larger income distances with those above him means a larger *relative deprivation* that we hypothesized can produce *envy* effects. Alternatively, under *compassion* effects, larger income distances with those below him mean a larger *relative affluence* that can influence subjective well-being also negatively.

- *Socio-economic Hypotheses:* These hypotheses, as in Chapters 5 and 6, are based on the empirical regularities from previous studies. At this respect, regarding gender, age, marital status, education and labor market status we

expect similar results to those find for developed economies. Furthermore, the evidence with respect to the well-being effects of the number of adults and children living in the same household is mixed, differs across countries and depends of the household composition (Dolan et al., 2008). Some previous evidence from Germany has found a positive effect of children (Plug, 1997), while others have found that both, the number of adults and the number of children in the household have a negative impact on subjective well-being (Frijters et al., 2004; van Praag and Ferrer-i-Carbonell, 2004; van Praag et al., 2003). Foreigner status is expected to have a negative influence on individuals well-being (Frijters et al., 2004), and being a house owner is expected to influence positively (van Praag and Ferrer-i-Carbonell, 2004). Although house ownership can be interpreted as a proxy of the individual's wealth, and could be included in the analysis of the *Resources Hypothesis,* in the present chapter we shall consider this information only as an individual' socio-economic characteristic.

7.3. Data and Variables.

7.3.1. Data.

In this chapter we do not use the dataset used in Chapters 5 and 6. Given that the aims of our study focus on the individuals' income, the empirical analysis demands a good source of information. Thus, in this work the empirical analysis is based on data from the German Socio-Economic Panel (GSOEP)[57]. The annual panel survey was initiated in 1984, first in the Federal Republic of Germany (West Germany) with just under 6.000 households at the time. After June 1990, East German households were included in the GSOEP extending the sample. To counter the adverse effect of panel attrition on the sample sizes, supplementary booster samples were added in 1994/95 (about 500

[57]The dataset was extracted using PanelWhiz. See Haisken-DeNew and Halm (2006 and 2010). For more information on the GSOEP, please see http://www.diw.de/soep. Any data or computational errors in this work are our own.

immigrant households), 1998 (about 1100 households) and 2000 (about 5000 households). At current, the GSOEP interviews approximately 24000 individuals aged lying in more than 11000 households annually. This chapter draws from the period 1992 to 2008, leaving us with 278004 observations based on 38269 individuals from the East and West Germany.

Latter in section 7.5, estimation results will be given for the whole sample as well as for the two subsamples of Easterners and Westerners. Although the populations are converging since the reunification of the two German states, we handle them as different subsamples. This is done so as to capture possible differences between both regions due to the fact that both populations lived separately and under different economic and political circumstances for a very long time.

7.3.2. Variables.

The Subjective Well-being Measurement

The survey contains information about individuals' satisfaction with life as whole, and also with their financial situation, housing, health, leisure and with their job for those who are working. Table 7.1 presents some summary statistics for all satisfaction questions. The answers are elicited on a single item 11 point scale. We assume that each individual makes an evaluation of his utility and classifies it under one of the categories to his disposition.

------- Insert Table 7.1 about here -------

We notice that average satisfaction in all the satisfaction answers (also called domains) for Easterners is lower than that for Westerners. This pattern was also observed by van Praag et al. (2003), who use the GSOEP data from 1992 to 1997. As proxy to individuals' utility, to our analysis we use the answer to the question about general satisfaction. The exact question of the survey reads as follows: "*How satisfied are you with your life, all things considered? Please answer according to the following scale: "0" means completely dissatisfied, "10" means completely satisfied*". The

average general satisfaction for our whole German sample is 6.93, it is 7.11 for the Western and 6.42 for the Easter sample.

Definition of the Explanatory Variables

The key variable in this analysis is y_i, which represents individual's monthly household net income after tax. Individual welfare or well-being function is often assumed to be concave in income and, consequently, income is introduced in logarithmic form. This variable allows us to test the *Resources Hypothesis*. The average income in the whole sample is 2450.50, while is 2602.48 for the Western sample and 2016.01 for the Eastern. Table 7.2 presents the main descriptive statistics of the variables used.

------- Insert Table 7.2 about here -------

Based on the information about y_i, we also construct the variables associated to the *Symmetric* and *Asymmetric Relative Standing Hypotheses.* Regarding each of the alternative models of the relative standing effect presented above, we define the following variables. In order to test the *mean dependence model* presented in the *Symmetric Relative Standing Hypothesis* we define the reference income with the variable $\bar{y}_r$, which is the average income of others in the reference group calculated as $\bar{y}_r = \left(\frac{1}{N_r}\right)\sum_{j\neq i} y_j$, where *j* are the individuals who belong to the same group, and N_r the number of individuals considered in the group. The present study follows previous literature and characterizes reference groups depending on some geographical and socio-economic characteristics that shall be described later on. The average reference income is also included in logarithmic form. The mean value of the reference income $\bar{y}_r$ is 2423.00 for the whole sample of Germans, 2569.33 for the West and 2005.07 for the East.

The second alternative for testing symmetric relative standing considers that individual's well-being depends of a relative component where one's own income is compared with the average income of the reference group. Given that individual and reference income are both included in logarithmic form, this *relative income* is defined as $y_i - \bar{y}_r$, with an average of -0.11 for the whole German and the West sample and -

0.09 for the East sample.

To consider the *Asymmetric Relative Standing Hypothesis* we define a set of variables. First, in order to test whether individuals below and above average income can be affected differently by changes in their relative standing, we define the variables I_1 and I_2

$$I_1 = \begin{cases} y_i - \bar{y}_r & \text{if } y_i \geq \bar{y}_r, \\ 0 & \text{if } y_i < \bar{y}_r. \end{cases} \qquad I_2 = \begin{cases} \bar{y}_r - y_i & \text{if } y_i \leq \bar{y}_r, \\ 0 & \text{if } y_i > \bar{y}_r. \end{cases}$$

where I_1 and I_2 measure how wealthier or how poorer the individual is with respect to her reference group's mean income respectively. The mean value of the variable I_1 is 0.13 for the East and for the whole German sample, and 0.14 for the West sample. The mean value of I_2 goes from 0.22 for the Easterners to 0.25 for the Westerners and 0.24 for all the Germans.

An alternative way to test the *Asymmetric Relative Standing* effect, our contribution, we define some variables incorporating the possibility that individual's well-being is differentially affected by the income distribution above and below the individual's income

According to Yitzhaki (1979), the *relative deprivation* for an individual with income y_i with respect to another individual in her reference group with income y_j can be represented as

$$a_1(y_i; y_j) = \begin{cases} y_j - y_i & \text{if } y_j \geq y_i, \\ 0 & \text{if } y_j < y_i \end{cases}$$

The total *relative deprivation* experienced by an individual with income y_i with respect to all individuals in the reference group in discrete terms, if we consider the number of individuals in the reference group as finite, can be expressed as:

$$A_1(y_i) = \frac{1}{n} \sum_{y_j > y_i} a_1(y_i; y_j)$$

It is also possible that an individual may care about being richer than other individuals. We define her *relative affluence* with respect to an individual with income y_j as:

$$a_2(y_i; y_j) = \begin{cases} y_i - y_j & \text{if } y_i \geq y_j, \\ 0 & \text{if } y_i < y_j \end{cases}$$

and her total relative affluence as

$$A_2(y_i) = \frac{1}{n} \sum_{y_j \leq y_i} a_2(y_i; y_j) = -\frac{1}{n} \sum_{y_j \leq y_i} (y_j - y_i) = A_1(y_i) - (\bar{y}_r - y_i)$$

These *relative deprivation* and *affluence* measures have the advantage of being individual rather than reference group specific. Thus, the fourth alternative of the relative standing effect considers both, $A_1(y_i)$ and $A_2(y_i)$ pondered by the average income in the reference group, affecting individual well-being. The mean values of $A_1(y_i)$ and $A_2(y_i)$ are 0.25 and 0.26 for the whole sample, 0.26 and 0.27 for the West, and 0.23 and 0.24 for the East.

Finally, to test whether individual's well-being is sensible to the distances in incomes and to the variance in the income distribution of those above and below her own income, we consider a modified version of the coefficient of variation of the income distribution above and below the individual's income as follows:

$$A_1^2(y_i) = \frac{\sqrt{\frac{1}{n} \sum_{y_j > y_i} (y_j - y_i)^2}}{\bar{y}_r} \qquad A_2^2(y_i) = \frac{\sqrt{\frac{1}{n} \sum_{y_j < y_i} (y_i - y_j)^2}}{\bar{y}_r}$$

This means, the square root of the sum of the gaps between the individual's income and the incomes of all individuals richer than him to the square, and the square root of the sum of the gaps between the individual's income and the incomes of all individuals poorer than him to the square, both pondered by the mean. The mean values of $A_1^2(y_i)$ and $A_2^2(y_i)$ are 0.48 and 0.34 for the whole sample, 0.50 and 0.35 for the West, and 0.40 and 0.32 for the East.

Following the related literature, in this chapter we include the more usual correlates of subjective satisfaction based on the literature and data availability to include the idea behind the *Socio-economic Hypotheses*. Table 7.2 contains descriptive statistics of the variables included. These are education, gender, age, region, number of children and adults at home, whether the individual works, is house owner and was born in Germany. Definitions of the variables used are given in the appendix A.

Constructing the Reference Group Income

The determination of the relevant reference group and the relevant reference outcome for a given class of individuals is ultimately an empirical question. The social context, the saliency of particular agents, and the social proximity among individuals are all likely to influence reference groups and outcomes. Surveys usually contain no direct questions about the composition of reference groups and there is no direct evidence to identify those whom people really compare themselves to: that is there is only indirect information about who are the relevant others for each individual.

Some papers have hypothesized that comparisons are made with respect to neighbors, the inhabitants of the geographical area where the respondent lives (Blanchflower and Oswald, 2004a; Ferrer-i-Carbonell, 2005; Luttmer, 2005; Persky and Tam, 1990). Certain authors elicit colleagues or people exerting the same profession as being the relevant others (Clark and Oswald, 1996; Brown et al., 2008; Senik, 2004). Others consider other characteristics to construct the reference groups. For example, education level and age (Ferrer-i-Carbonell, 2005), or also a combination of that with employment status (van de Stadt et al., 1985).

In this chapter, we adopt the following criterion. We build reference groups based in age bracket, similar education level and region (West or East). We define five categories of education according to the number of years of education: less than 10, 10 or 10.5, 11 or 11.5, 12, and 12 or more years of education. The age brackets are: 18-24, 25-34, 35-44, 45-65, and 66 or older. The regions are West or East Germany. This generates 50 difference reference groups per year (850 groups generated).

7.4. Empirical Model.

As mentioned, we assume that individuals do a subjective evaluation of their situation as a whole and express their own measure of general satisfaction GS_{it} derived from the maximization of their utility function GS_{it}^{*}. In consideration of the ordinal nature of our general satisfaction variable, the analysis based on ordered discrete choice models should provide a better fit. In summary, we assume that there exists a latent variable GS_{it}^{*} (not direct observable) and a partition of the real axis into intervals $(-\infty, \mu_1], \ldots, (\mu_{11}, \infty)$, such that the latent variable $GS_{it}^{*} \in (\mu_k, \mu_{k+1}]$ if the individual responses category *k* to the general life satisfaction question, which is $GS_{it} = k$.

As it has been already exposed in Chapter 2, these responses are modeled assuming that the underlying subjective well-being (GS_{it}^{*}) is a linear function of a set of observable (Z_{it}) and unobservable factors (ε_{it}) as $GS_{it}^{*} = Z_{it}'\beta + \varepsilon_{it}$. Assuming independence between ε_{it} and Z_{it}, the probabilities of the observed outcomes are derived from:

$$\Pr(GS_{it} = k) = \Phi(\mu_k - Z_{it}'\beta) - \Phi(\mu_{k-1} - Z_{it}'\beta)$$

where $\Phi(.)$ is the cumulative density of the standard normal distribution function (c.d.f). The regression parameters β, and the *K-1* threshold parameters, $\mu_0, \ldots, \mu_{K-1}$ are obtained by maximizing the log likelihood function subject to $\mu_k > \mu_{k-1}$ for all k. The sign of the estimated parameters β can be interpreted as determining whether satisfaction increase *ceteris paribus* with a given regressor. If the estimate parameter is positive, then an increase in the associated variable increases the probability of being in the highest category of satisfaction and decreases the probability of being in the lowest[58].

Our empirical analysis will make use of the panel structure of the data set and will use Mundlak's transformation to control for unobserved individual effects. We

[58] The sign of the partial effects in intermediate categories is however ambiguous, because the difference of the two densities can have either sign (Greene, 2009).

specify a pooled panel ordered probit model, which is augmented to account for unobserved time-invariant individual effects. Recall that in the present chapter we have presented some hypotheses and a set of variables to test them. Specifically, this latent satisfaction *(GS_{it}^{*})* is assumed to be related linearly to the individual's resources (y_{it}), her relative standing $f(y_{r,it})$ (symmetric or asymmetric), and other socio-economic characteristics (X_{it}). Thus, GS_{it}^{*} is described in the following way:

$$GS_{it}^{*} = \beta_0 + \beta_1(y_{it}) + \beta_2 f(y_{r,it}) + \delta X_{it} + \varepsilon_{it}$$
$$i = 1, \dots, N; \quad t = 1, \dots, T.$$

where i represents the individual, t the period, and ε_{it} is the error term.

Under individual random effects, the error term of this equation can be rewritten as $\varepsilon_{it} = \epsilon_i + \pi_{it}$, where ϵ_i is the random effect and π_{it} the error term. Understanding that random effects is an strong assumption, because it implies that unobservable individual characteristics are not correlated with the covariates, Mundlak (1978) proposes a model where unobserved effects are assumed to be normally distributed conditional on the mean of the covariates, thus obtaining a within estimator in the random effects framework. Thus, what we do, following Ferrer-i-Carbonell and Frijters (2004) and regarding random effects, is modeling the conditional distribution of such a term with respect to a subset w_{it} of the covariates (the time-varying variables): $\epsilon_i|\mathrm{w}_{it} \sim N(\bar{w}_i\eta, \sigma_\epsilon^2)$, where $\bar{w}_{\mathrm{i}} = T^{-1}\sum_{t=1}^{T}\mathrm{w}_{it}$. This means, the correlation between w_{it} and the individual random effect ϵ_i is assumed as $\bar{w}_i\eta$. The subset of variables w_{it} includes variables that vary across time such as family income, years of education and members of the household.

Then, incorporating time fixed effects and individual random effects $\epsilon_i = \bar{w}_i\eta + \lambda_i$ in the subjective well-being equation, the model can be rewrite as:

$$GS_{it}^{*} = \beta_0 + \beta_1(y_{it}) + \beta_2 f(y_{r,it}) + \delta X_{it} + \tau T + \bar{w}_i\eta + \lambda_i + \pi_{it}$$

where λ_i and π_{it} are errors normally distributed with mean zero. As in Ferrer-i-Carbonell (2005), we also include, time fixed effects T. This variable accounts for the

yearly changes that are the same for all individuals[59].

Employing this empirical strategy, we adjust five different regression models. Given that our main interest focus on the influence of the individual's relative standing on individual's well-being, we start from the models proposed to test the *Symmetric Relative Standing Hypothesis*, the *mean dependence* and the *relative income* model, which are our benchmark cases. Afterward, under the same assumption that individuals compare themselves with respect to the average, we consider a model where income comparisons are not symmetric. Going further in the consideration of asymmetries, we propose the last two models, where we address the effect of income comparisons considering the whole distribution of income in the reference group.

In Model A individuals' life satisfaction is assumed to be influenced by individual's income, control variables, and the average income of the reference group, which is $f(y_{r,it}) = \bar{y}_{r,t}$.

$$GS_{it}^{*} = \beta_0 + \beta_1(y_{it}) + \beta_2\,(\bar{y}_{r,t}) + \delta X_{it} + \tau T + \bar{w}_i\eta + \lambda_i + \pi_{it} \qquad \text{(A)}$$

Given the evidence from previous studies for developed economies (Clark and Oswald, 1996; McBride, 2001) and specifically for Germany (Ferrer-i-Carbonell, 2005; van Praag and Ferrer-i-Carbonell, 2004), we expect that individual's income influences positively subjective well-being ($\beta_1 > 0$), and reference group's average income has a negative effect ($\beta_2 < 0$). Notice that, under this estimation it is possible to test a simplified version of the Easterlin's paradox, which is the idea that raising the income of all does not increase the happiness of all. This means, we can test whether $\beta_1 + \beta_2 = 0$.

The second proposed model assumes that individual's subjective well-being is influenced by a relative component where one's own income is compared with the average income of the reference group. This is, Model B assumes $f(y_{r,it}) = y_{it} - \bar{y}_{r,t}$.

[59] With the inclusion of this time fixed effects it is not necessary to transform monetary variables from nominal to real terms.

$$GS_{it}^{*} = \beta_0 + \beta_1(y_{it}) + \beta_3\left(y_{it} - \bar{y}_{r,t}\right) + \delta X_{it} + \tau T + \bar{w}_i\eta + \lambda_i + \pi_{it} \qquad \text{(B)}$$

where β_3 is expected to be positive. The richer an individual is in a comparison with others, the happier she will be (Ferrer-i-Carbonell, 2005; Dynan and Ravina, 2007). Similarly, if $\bar{y}_{r,t}$ is larger than y_{it}, then the larger the difference, the unhappier the individual will be.

In order to analyze the *Asymmetric Relative Standing Hypothesis*, we propose the models C, D and E. In Model C we test whether the effect of the relative position on individuals' subjective well-being is asymmetric. This equation incorporates the variables I_1 and I_2 to model $f\left(y_{r,it}\right)$. These variables measure how wealthier (I_1) or how poorer (I_2) the individual is with respect to her reference group's mean income.

$$GS_{it}^{*} = \beta_0 + \beta_1(y_{it}) + \beta_4 I_1 + \beta_5 I_2 + \delta X_{it} + \tau T + \bar{w}_i\eta + \lambda_i + \pi_{it} \qquad \text{(C)}$$

The effect of the variable I_1 on individual's subjective well-being (in absolute terms) is expected to be smaller than the effect of the variable I_2*:* $|\beta_4| < |\beta_5|$. Even from some prior literature if it is assumed that wealthier people is not influenced by the others' resources, which would mean that $\beta_4 = 0$.

All the presented alternatives (Models A to C) of modeling relative standing capture, for example, a version of the Easterlin paradox, where individual happiness is increasing in own income y_i and should be increasing in cross section, although, individual's utility could not rise over time when her income rise no faster than the average income in her reference group (Hopkins, 2008).

In order to test whether individuals' well-being is affected differently by changes in others' income above and below the individual own income position, we propose Models D and E. In these models we use the concepts of *relative deprivation* and *relative affluence* to express an extensive version of the *model of inequity aversion*, such as the one proposed by Fehr and Schmidt (1999) from behavioral economics. Model D assumes $f\left(y_{r,it}\right) = f\left(A_1(y_{it}), A_2(y_{it})\right)$, such that

$$GS_{it}^{*} = \beta_0 + \beta_1(y_{it}) + \gamma_1 A_1(y_{it}) + \gamma_2 A_2(y_{it}) + \delta X_{it} + \tau T + \bar{w}_i\eta + \lambda_i + \pi_{it} \qquad \text{(D)}$$

As in the Fehr and Schmidt model, in Model D the estimated parameters γ_1 and γ_2 measures the well-being loss or gain from disadvantageous and advantageous inequality. The general assumption in similar models from behavioral economics is that $\gamma_1 < 0$, which means that the effect of an increase in the income of someone who is richer than you is negative, because induce a rise on individual's *relative deprivation*. Following Friedman and Ostrov (2008), this effect is called *envy*. If γ_2 is negative, then and increase in *relative affluence* given a low income for others reduce one's own well-being, which is called *compassion*. But γ_2 is positive, then there is *pride* and the lower incomes for others raise the individual's well-being. Cooper and Kagel (2009) notice that the summations in this model cannot be replaced with the average income of others, as the distribution of income over others affect the individual well-being function. However, the case where only income relative to the average in the reference group matters for individual's well-being can be nested. This will be when $\gamma_1 < 0$ and $\gamma_1 + \gamma_2 = 0$.

Further to this formulation, we propose Model E, which incorporates to Model D the variance in the income distribution of those above and below individual income with the variables $A_1^2(y_{it})$ and $A_2^2(y_{it})$.

$$GS_{it}^{*} = \beta_0 + \beta_1(y_{it}) + \gamma_1 A_1(y_{it}) + \gamma_2 A_2(y_{it}) + \gamma_3 A_1^2(y_{it}) + \gamma_4 A_2^2(y_{it}) + \delta' X_{it} + \tau T + \overline{w}_i \eta + \lambda_i + \pi_{it} \quad \text{(E)}$$

Previous literature has shown the relationship between inequality and happiness. However, none of these prior evidences consider possible differences in the effect of a wider distribution of income on subjective well-being. Model E considers the possibility that the distribution of income of the richer has a different effect on individual's subjective well-being than the distribution of income of the poorer.

7.5. Results.

Tables 7.3 to 7.5 report the results for the life satisfaction regressions with the

specification of the relative standing hypotheses presented in Models A to E. Table 7.3 shows the results for the sample of all the Germans, Table 7.4 considers the West sample and Table 7.5 the East sample.

------- Insert Table 7.3, 7.4 and 7.5 about here -------

Consistent with the findings from previous studies, all the socioeconomic variables included present the expected results. The estimated coefficients reveal that men tend to report lower satisfaction than women, registered unemployed are less satisfied than other non-workers, education has a positive effect, while satisfaction exhibits a U-shape relationship with age (Frey and Stutzer, 2002; Blanchflower and Oswald, 2004a and 2008). Being married or living with a couple and being house owner have a positive effect on life satisfaction. The Easterners report in average lower life satisfaction than the Westerners. The discussion hereafter focuses on the income coefficients.

7.5.1. Evidence from the Symmetric Relative Standing Hypothesis.

In the most simple specification of the relative standing hypothesis, where self-reported satisfaction is influenced by other's average income $f\left(y_{r,it}\right) = \bar{y}_{r,t}$, as it was proposed in Model A and presented in the first column, family income are highly significant and positive correlated with life satisfaction for all the three sub-samples, namely: Germans, Easterners, and Westerners. As expected (Ferrer-i-Carbonell, 2005; McBride, 2001) the results show that reference average income has a negative and significant coefficient.

For all the sub-samples, the coefficients of average reference income and absolute own family income are very similar between them. Although, for the subsamples of the Westerners and Easterners the coefficient of the average income of the reference group seems higher than the coefficient of the individual's own family income, and for the total sample of Germans is the opposite, these differences are not significant, i.e. $\beta_1 + \beta_2$ are not statistically different to zero for any of the three sub-samples. This means, that an additional income may not increase individual happiness

if those in the reference group also gain a similar increase, confirming previous evidence (Clark and Oswald, 1996; Frank, 1999; Luttmer, 2005).

The second column presents the estimation results of Model B considering $f(y_{r,it}) = y_{it} - \bar{y}_{r,t}$. Ferrer-i-Cabonell (2005) uses the GSOEP 1992-1997 and includes this gap. Her results showed that the difference between individual income and others' average income affects individual subjective well-being in a positive way (only) for the whole sample. She also found that when relative income is included in the regression, absolute income becomes no significant.

Results in Model B can be read as extensions of Ferrer-i-Carbonell's findings, with a larger sample (from 1992 to 2008). The coefficient of the gap between individual income and the average income of the reference group remains positive for the new large sample, suggesting that a larger difference between individual's own and the average income of the group increase individual's satisfaction, while a larger negative difference decreases individual's life satisfaction. However, contrary to Ferrer-i-Carbonell's (2005) findings, in Tables 7.4 and 7.5 we observe that for our sample this coefficient is significant for all the three subsamples.

7.5.2. Evidence from the Asymmetric Relative Standing Hypothesis.

Mean Reference Framework

By testing the asymmetric effect of the gap between individual income and the average of the reference group, the subjective well-being regressions presented in the third column in Tables 7.4 and 7.5 includes $f(y_{r,it})$ as it is proposed in Model C. As in the previous specification, the coefficient of the individual's family income is non-significant for all the sub-samples and there are not important variations in the coefficients and the significance of the other covariates. In all the Germans (Table 7.3) and the Westerners (Table 7.4) sub-samples the coefficient of the variable I_1 is larger in absolute value than the coefficient of I_2[60]. Similar with Ferrer-i-Carbonell (2005), the

[60]The hypothesis of $\beta_4 = -\beta_5$ was rejected in both cases with $p < 0.001$.

coefficient for I_2 is non-significant and smaller in absolute value than the coefficient for I_1 for these two sub-samples. Then, the evidence suggests that the effect of income comparisons is a negative influence only for the well-being of the poor. Although, for the Easterners (Table 7.5) the well-being loss from earning less than others seems greater than the corresponding gain from earning more[61], the statistical evidence shows that the difference between the coefficient of the variables I_1 and I_2 is non-significant and that the comparison effect with respect to the average income in the reference group in this case is statistically symmetric[62].

The asymmetry of income comparisons under this mean income framework shows that for the Germans and the Westerners sub-samples, an increase in the average income of the reference group has a negative effect on the individual's satisfaction of the poorer (those whose income is below the average), while has not effect on the life satisfaction of the richer.

Upward and Downward Comparisons

As we have already mentioned, we borrow the ideas of the inequity aversion model of Fehr and Schmidt (1999) to test asymmetry in upward and downward comparisons in individual's satisfaction as an alternative to the mean reference framework. In the fourth column we present the results of the subjective well-being equation where the relative income term $f(y_{r,it})$ is represented by the measures of *relative deprivation* and *relative affluence*, as it was showed in Model D, and normalized by the mean income of the reference group to avoid problems of scale. In this case, we assume that the comparison income effect is symmetric if individual's subjective well-being is affected in the same way by an increase in other's income of someone poorer than her and of someone more successful. Remembering the notation of Model D, comparison income effect is symmetric when $\gamma_1 + \gamma_2 = 0$. Thus performing upward and downward comparisons generates a symmetric effect on individual's life satisfaction.

[61]The coefficient for β_5 seems larger than the coefficient for β_4 in absolute value for the Easterners.
[62]The p-value of the Wald test of $\beta_4 = -\beta_5$ equals 0.169.

Estimation results of Model D from Tables 7.3 to 7.5 indicate that for all the three sub-samples the comparison income effect is non-symmetric[63]. The coefficient for *relative deprivation* is negative and larger in absolute value than the coefficient for *relative affluence*, indicating that individuals' well-being are negatively influenced by other's income above themselves in the income distribution. Although, the coefficient for *relative affluence* is smaller than the coefficient for *relative deprivation*, for Westerners (Table 7.4) and for the whole sample (Table 7.3) their subjective well-being is positive influenced by an improving in the performance of others below themselves in the income distribution. Our findings are close to the evidence of *compassion* from behavioral economics literature (Cooper and Kagel, 2009), although it had not been tested previously in happiness economics.

Model D of Table 7.5 shows that for the Easterners the coefficient for *relative affluence* is positive and significant, indicating that an increasing in the income of other poorer than the individual cause a fall in her relative affluence affecting negatively individual's subjective well-being. However, for the Easterners and for the other sub-samples the effect of upward comparisons is negative and ten times larger in absolute value than the effect from downward comparisons.

As a further specification of the relative income hypothesis, the fifth column includes a modified version of the coefficient of variation of the income distribution above and below the individual's income (Model E). When these variables are included, relative affluence appears non-significant and the coefficient of relative deprivation is now more negative compared with the results in Model D. The estimated coefficients of γ_1 and γ_3 may be interpreted as a nonlinear effect of *relative deprivation* on individual's well-being. It is possible that the influence of the rise in the income of someone richer on individual's well-being depends on the distance between the one's own income and that of the other. Although, an increase in the income of a richer individual is a negative externality, it is possible that if the richest in the reference group becomes even richer, that generate a positive influence on

[63]Performing the Wald test for $\gamma_1 + \gamma_2 = 0$ gives $p < 0.001$ for each of the sub-samples.

individual's well-being.

7.6. Extensive Analysis and Further Results.

Recent literature explores asymmetries in the effect of income on subjective well-being, based on the idea that the determinants of satisfaction and dissatisfaction are not the same. Clark et al. (2005), using latent class models and data from the European Community Household Panel, find that the effect of an income change is larger in the *latent satisfied* than in the *latent dissatisfied* classes. Mentzakis and Moro (2009) and Boes and Winkelmann (2010), using generalized ordered logit models, show that the effect of income is different in different parts of the satisfaction distribution. Given these evidences, as a further analysis, we explore the marginal effects of the relative standing variables on the subjective well-being distribution in each one of the proposed models. We follows the methodology proposed by the latter studies (Mentzakis and Moro, 2009; Boes and Winkelmann, 2010), and explore the marginal effects using the standard ordered probit and also the generalized ordered probit model.

7.6.1. Marginal Effects.

In the standard ordered probit model that we described in section 7.4, the marginal or partial effect on the probability of choosing alternative *k* when the regressor Z_m changes is given by:

$$MPE_{km}(Z) = \frac{\partial Pr\,(GS_{it} = k)}{\partial Z_{mit}} = [\phi(\mu_{k-1} - Z'_{it}\beta) - \phi(\mu_k - Z'_{it}\beta)]\beta_m$$

where $\phi(.)$ denotes the density function of the standard normal distribution. If one coefficient is twice as big as another, then so too is the size of the marginal effect. From the last expression it is easy to infer that the magnitude of these probability changes depends on the specific values of the covariates for the i*th* observation. However, as it is shown by Boes and Winkelmann (2006), a closer look to the

$MPE_{km}(Z)$ becomes apparent two restrictive properties of the marginal probability effects in standard ordered response models, limiting their practice usefulness. First, the relative marginal probability effects are constant across individuals and the outcome distribution. From the previous expression of the marginal effects it is possible to conclude that:

$$\frac{MPE_{km}(Z)}{MPE_{kl}(Z)} = \frac{\beta_m}{\beta_l}$$

which does not depend on i and k. Notice that this ratio leads to the concept of *compensation variation*[64]. In this case, for example, that ratio can measure how much of a variation in individual's income is needed to offset the given change in another regressor (each one of those used to test relative standing hypotheses) such that all probabilities remain unchanged. In standard ordered models this *compensation variation* is the same across the distribution of satisfaction.

As a second restriction, Boes and Winkelmann (2006) point out that the *single crossing property*, from the standard normal and the logistic density functions, precludes a flexible analysis of the marginal probability effects by design. The marginal probability effect in these models can change their sign only once when moving from the smallest to the largest outcome.

As presented in Chapter 2, the generalized ordered probit model allows for different parameter vectors of thresholds μ_k (by making them dependent on covariates $\mu_k = \tilde{\mu}_k + Z_i'\gamma_k$), while the standard model restricts those parameters to be the same. Therefore, the generalized ordered model allows for more flexibility in the marginal probability effects, and hence in the relative marginal probability effects. For

[64] If $\Pr(GS_{it} = k) = \Phi(\mu_k - Z_{it}'\beta) - \Phi(\mu_{k-1} - Z_{it}'\beta)$ is totally differentiated, it can follows that $d\Pr(GS_{it} = k) = MPE_{km}dZ_m + MPE_{kl}dZ_l$, from which it is possible to answer how much of a variation in one regressor (*l*) is needed to offset the given change in another regressor (*m*) such that $d\Pr(GS_{it} = k) = 0$. Rearranging terms, we obtain than $\frac{dZ_l}{dZ_m} = -\frac{MPE_{km}}{MPE_{kl}}$, then $\frac{dZ_l}{dZ_m} = -\frac{\beta_m}{\beta_l}$.

example, the marginal effects on the highest and the lowest levels of satisfaction can have equal sign in the generalized model but not in the standard one (Boes and Winkelmann, 2006, 2010). The marginal effects in the generalized response models are calculated as follows:

$$MPE_{km}(Z) = \phi(\tilde{\mu}_{k-1} - Z_i'\beta_{k-1})\beta_{(k-1)m} - \phi(\tilde{\mu}_k - Z_i'\beta_k)\beta_{km}$$

Given the complexity of the analysis proposed, in the current chapter we present the estimation results of the marginal effects for the standard and the generalized ordered probit using data for the whole German sample in the year 2008.

7.6.2. Further Results.

Tables 7.6 and 7.7 display the estimated marginal effects on individual income and relative standing variables for each one of the proposed models (A to E) with two different estimation strategies: the standard ordered probit (Table 7.6) and the generalized ordered probit (Table 7.7). The evidence presented in this section uses the cross-section data for the year 2008, and then variables means that were included in the panel data estimation are not included now as additional regressors.

------- Insert Tables 7.6 and 7.7 about here -------

Comparing the marginal probability effects among the standard and the generalized ordered models over all the possible outcomes, we obtain the following results. The marginal effects of individual and average reference income in the standard ordered model are significant across all the distribution of satisfaction in Model A, and the signs change in the average level of satisfaction. Such that more income reduces the probability of low satisfaction (0-7) and increases the probability of high satisfaction (8-10), with similar effects in the generalized model, with the exception that for the levels '0' and '7' the effect is not significant. A rise in the average income of the reference group increases the probability of low levels of satisfaction (0-7) and reduces the probability of high satisfaction in the standard ordered model, whereas in the generalized model there is a significant negative effect on the

probability of high satisfaction (levels 8 and 9) and a positive influence on the probability of report a level of satisfaction of '4'. Thus, based on the generalized ordered probit, there is no evidence for others' average income to have an effect on very low satisfaction.

In Model B the effect of individual income on subjective well-being in the standard ordered probit follows a similar pattern than in Model A, although in the generalized ordered probit higher income increase the probability of high satisfaction (8-10) and does not have influence on dissatisfaction (0-3). Curiously, higher income increases also the probability of a response of '4' and decreases the probability of report '5'. The improvement in relative income, which is caused by a reduction in the average income of the reference group controlling by individual income, reduces the probability of low satisfaction (0-7) and increases the probability of high satisfaction (8-10) in the standard ordered probit. However, in the generalized ordered probit a rise in relative income increase the probability of high satisfaction (8-9) and reduces the probability of a report of '4', with no significant influences on other levels of satisfaction.

The effects of individual income from the standard and the generalized ordered probit in Model C are similar to those obtained in Model B. Regarding relative standing, being richer (poorer) reduces (increase) the probability of low satisfaction (0-7) and increases (reduce) the probability of high satisfaction (8-10) in the standard ordered probit. The generalized estimation of Model C shows that the estimated coefficient associated to the distance between the individual own and the average income of the reference group, for those above the average (I_1), is only significant for the outcome '4' and for the highest level of satisfaction. This means that, controlling for individual income, an increase in I_1, caused by a reduction in the reference income, reduces the probability of a response of '4' and increase the probability of the highest satisfaction (10), but it does not affect the probability of dissatisfaction (0-3). Alternatively, an increase in the average income of the reference group, remaining individual income constant, enlarges the distance between the reference income and

the own income, increasing the probability of response '4' and decreasing the probability of high satisfaction (8-9) for those with an income below the average of the reference group.

In Model D income and relative deprivation have significant effects on all the levels of satisfaction in the standard ordered probit, while in the generalized model income is significant for intermediate (2, 3 and 5) and high satisfaction (8-10), and relative deprivation only has a significant positive effect on the probability of response '0', on the probability of '4', and a negative effect on the probability of high satisfaction (8-9). For relative affluence the standard ordered response estimation does not predict an effect significantly different from zero in any level of satisfaction, whereas the generalized model shows a significant and positive effect of relative affluence in the probability of low levels of satisfaction (1-2) and also in the highest satisfaction (10). This means that a reduction on the income of someone poorer than the individual, which increases the individual relative affluence, increases the probability of dissatisfaction (1-2) and also of the highest satisfaction (10).

Finally, results from Model E show significant effects of individual income and relative standing variables for all the levels of satisfaction in the standard model with the signs of the effects changing around '7'. From the generalized estimation, results show that individual income has a positive effect in the probability of high satisfaction (9-10) and a negative one in the probability of intermediate satisfaction (2,3 and 5). Regarding relative deprivation and affluence, results from the generalized model show that an increase in relative deprivation increases the probability of the responses '3' and '4', but it does not have any effect on high satisfaction nor in very low satisfaction, meaning that an increase in the income of someone richer than the individual predicts a significant effect only for outcomes '3' and '4'. The estimated coefficient associated to the variable A_1^2 suggests that this influence is not linear. Moreover, an increase in relative affluence, associated to a reduction in the income of someone poorer than the individual, influences positively the probability of response '5' and negatively the probability of response '8' in the generalized ordered probit model.

The relationship between well-being, income and relative standing at various parts of the general satisfaction distribution can alternatively be illustrated by the *relative* marginal probability effects or trade-off ratios. Table 7.8 shows the required changes in absolute income if there is an increase in the variable of relative standing, given that the value of reported satisfaction remains constant. In order to interpret the reported numbers, we must be careful with respect to the significance of the marginal effects. These trade-off ratios only make sense for significant income and relative standing effects. Following Boes and Winkelman (2010) we define four cases. When the marginal effect of individual own income is not significant, we put (×). When the variable about relative standing is statistically not different from zero, we mark it with (o). If the change required change in income is positive we mark a (+), and if is negative we put a (–).

------- Insert Table 7.8 about here -------

The first column of Table 7.8 reports the trade-off ratios for the standard ordered model. By construction, the trade-off ratios in the ordered model are constant for all the levels of satisfaction. In the case of Model A, the numbers in Table 7.8 shows that the individual's income must increase by 0.45% to offset an increase in the average income of the reference group by 1% in the standard model, while in the generalized model, required income changes vary between 0.46 and 2.01%. These compensations income in the generalized model are only effective for high levels of satisfaction (8-9) and for the response '4'. For Model B, in the generalized model the compensations in terms of income for an increase in relative standing also does only make sense for levels of satisfaction 4, 8 and 9, varying between 0.87 and 1.99%. Although the interpretation of the trade-off ratios for Model C to E is not as straightforward as in the first models, the signs associated to the ratios follow the same explanation, show the heterogeneity of the relative standing influences across the distribution of well-being.

7.7. Conclusions.

In this chapter we presented empirical test of the relative income hypothesis under two differential frameworks, the mean reference and an extension of the inequity aversion model proposed by Fehr and Schmidt (1999) in behavioral economics. Our empirical evidence use the responses to question about general satisfaction in the German Socio-economic Panel from 1992 to 2008 making a distinction between East and West Germany.

In line with previous literature, we find that others' income influence individual's subjective well-being. Although, the inclusion of the average income of the reference group in the subjective well-being equation does not change the significance neither the coefficient of the individual's own family income, both variables exert opposite effects on subjective well-being for all the samples considered, which confirm that an additional income may not increase individual happiness if those in the reference group also gain a similar increase.

Assuming the importance of others' income on individual subjective well-being, we analyzed two sources of asymmetries in the comparison income effect. First, under the mean reference framework, we explore how the well-being of individuals below and above the average income in their reference groups is influenced by changes on others' average income. Our findings at this respect suggests an asymmetric effect of income comparisons between *rich* and *poor* individuals, meaning that the well-being loss from earning less than others is greater than the corresponding gain from earning more for the whole German and the West sub-samples.

Our contribution is the consideration of a second source of asymmetry in the comparison effect in terms of upward and downward comparisons. Using the concepts of *relative deprivation* and *relative affluence*, our evidence suggests that controlling by own income, an increase in the income of someone richer induces an increase in *relative deprivation*, which is associated to lower levels of well-being. Conversely, an increase in the income of someone poorer causes a decrease in *relative affluence,* and

that affects individual's well-being positively. Our findings also suggest that upwards income comparisons have larger influences than downward comparisons, although the latter also have a significant effect for the whole German and the West samples.

As discussed by Hollander (2001), evidence for upward comparison would suggests that increasing the wealth of those lower in the income distribution will not have huge negative effects on those that are higher in the distribution. Essentially, wealth redistribution might not reduce individual work incentives to as large an extent as is typically believed.

As additional results, we also find evidence about heterogeneity of the relative standing influences across the distribution of well-being. Our evidence for this last finding is based on cross-section analysis, and for that it can be biased for unobserved personality effects. However, our findings highlight the need of extending the analysis of asymmetries in the relationship between relative income and subjective well-being to a more flexible methodology estimation of marginal probability effects that generalized ordered probit models can offer.

Appendix A.

Description of the Explanatory Variables

Explanatory Variable	Description
Resources Variables	
y_i	Net monthly household income in Euros.
Relative Standing Variables	
$\bar{y}_r$	Average reference group's net household income.
$y_i - \bar{y}_r$	Distance between the logarithm of the individual's own income and the logarithm of the average reference group's income.
I_1	Distance between the logarithm of the individual's own income and the logarithm of the average reference group's income if the individual's income is larger or equal than the average reference group's income; 0 otherwise.
I_2	Distance between the logarithm of the average reference group's income and the logarithm of the individual's own income if the individual's income is smaller or equal than the average reference group's income; 0 otherwise.
$A_1(y_i)$	Sum of the gaps between the individual's income and all individuals richer than her in the reference group, normalized by the average income in the group; 0 otherwise.
$A_2(y_i)$	Sum of the gaps between the individual's income and all individuals poorer than her in the reference group, normalized by the average income in the group; 0 otherwise.
$A_1^2(y_i)$	Square root of the sum of the gaps between the individual's income and the incomes of all richer than her to the square, normalized by the mean; 0 otherwise.
$A_2^2(y_i)$	Square root of the sum of the gaps between the individual's income and the incomes of all porer than her to the square, normalized by the mean; 0 otherwise.
Socio-demographic Variables	
Male	Dummy variable: 1 if Male; 0 if Female.
Age	Logarithm of age in years.
Age squared	Logarithm of age in years to the squared.
Living together	Dummy variable: 1 if Married or cohabiting; 0 otherwise.
Education	Number of years of education in logarithm.
Unemployed	Dummy variable: 1 if registered unemployed; 0 otherwise.
Worker	Dummy variable: 1 if individual is working currently; 0 otherwise.
Adults at home	Number of adults that live in the individual's household in logarithm.
Children at home +1	Number of children (+1) younger than 16 in the household in logarithm.
German born	Dummy variable: 1 if individual was born in Germany; 0 otherwise.
House owner	Dummy variable: 1 if is house owner; 0 otherwise.
Easterner	Dummy variable: 1 if is living in the East; 0 otherwise.

Appendix B

Table 7.1. Average and Standard Deviations of Satisfaction Levels in the GSOEP 1992-2008.

	Germany			West-Germany			East-Germany		
	Mean	**S.D**	**Obs.**	**Mean**	**S.D**	**Obs.**	**Mean**	**S.D**	**Obs.**
General Satisfaction	6.93	1.79	278004	7.11	1.76	205908	6.42	1.78	72096
Job Satisfaction	6.95	2.14	167764	7.04	2.10	125440	6.67	2.22	42324
Financial Satisfaction	6.25	2.28	274449	6.51	2.22	203237	5.52	2.29	71212
Housing Satisfaction	7.63	2.01	276745	7.73	1.98	205019	7.35	2.07	71726
Health Satisfaction	6.62	2.23	277485	6.71	2.24	205519	6.36	2.19	71966
Leisure Satisfaction	6.89	2.27	264278	6.99	2.26	195908	6.60	2.26	68370

Table 7.2. Descriptive Statistics GSOEP 1992-2008.

	Germany		West-Germany		East-Germany		Min	Max
	Mean / Prop.	**S.D**	**Mean / Prop.**	**S.D**	**Mean / Prop.**	**S.D**		
Resources Variable								
y_i	2450.50	1622.48	2602.63	1745.27	2016.01	1093.91	10	85000
Relative Standing Variables								
$\bar{y}_r$	2423.00	689.60	2569.33	691.63	2005.07	481.38	834.18	4640.59
$y_i - \bar{y}_r$	-0.11	0.49	-0.11	0.50	-0.09	0.46	-6.14	3.44
I_1	0.13	0.23	0.14	0.24	0.13	0.21	0	3.44
I_2	0.24	0.35	0.25	0.36	0.22	0.33	0	6.14
$A_1(y_i)$	0.25	0.19	0.26	0.19	0.23	0.18	0	1.00
$A_2(y_i)$	0.26	0.41	0.27	0.43	0.24	0.32	0	30.20
$A_1^2(y_i)$	0.48	0.22	0.50	0.22	0.40	0.20	0	1.59
$A_2^2(y_i)$	0.34	0.41	0.35	0.44	0.32	0.33	0	30.22
Socio-demographic Characteristics								
Male	0.48	0.50	0.48	0.50	0.48	0.50	0	1
Age	46.85	16.83	46.75	16.85	47.12	16.78	18	100
Living together	0.64	0.48	0.65	0.48	0.62	0.49	0	1
Education	11.77	2.61	11.63	2.67	12.16	2.39	7	18
Unemployed	0.07	0.26	0.05	0.23	0.13	0.34	0	1
Worker	0.59	0.49	0.59	0.49	0.56	0.50	0	1
Adults at home	2.23	0.87	2.23	0.89	2.23	0.83	1	10
Children at home +1	1.58	0.93	1.60	0.96	1.50	0.83	1	11
German born	0.86	0.35	0.81	0.39	0.98	0.13	0	1
House owner	0.48	0.50	0.50	0.50	0.42	0.49	0	1
Easterner	0.26	0.44					0	1
Westerner	0.74	0.44					0	1
Number of Observations	278004		205908		72096			

Table 7.3. Evidence of Income Comparisons. Total Sample GSOEP 1992-2008.

Explanatory Variable	General Satisfaction				
	Model A	Model B	Model C	Model D	Model E
Resources Variable					
y_i	0.155***	0.027	0.029	0.061***	0.037
	(0.008)	(0.028)	(0.028)	(0.023)	(0.023)
Relative Standing Variables					
$\bar{y}_r$	-0.128***				
	(0.027)				
$y_i - \bar{y}_r$		0.128***			
		(0.027)			
I_1			0.025		
			(0.031)		
I_2			-0.179***		
			(0.028)		
$A_1(y_i)$				-0.325***	-0.532***
				(0.051)	(0.083)
$A_2(y_i)$				-0.038***	0.010
				(0.012)	(0.268)
$A_1^2(y_i)$					0.163***
					(0.034)
$A_2^2(y_i)$					-0.031
					(0.275)
Socio-demographic Characteristics					
Male	-0.039***	-0.039***	-0.041***	-0.041***	-0.041***
	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)
Age	-5.412***	-5.412***	-5.399***	-5.514***	-5.345***
	(0.237)	(0.237)	(0.237)	(0.237)	(0.241)
Age squared	0.694***	0.694***	0.693***	0.709***	0.685***
	(0.032)	(0.032)	(0.032)	(0.033)	(0.033)
Living together	0.174***	0.174***	0.164***	0.164***	0.162***
	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)
Education	0.294***	0.294***	0.290***	0.289***	0.287***
	(0.041)	(0.041)	(0.041)	(0.041)	(0.041)
Unemployed	-0.409***	-0.409***	-0.402***	-0.402***	-0.402***
	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)
Worker	0.023**	0.023**	0.021**	0.020**	0.021**
	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)
Adults at home	-0.096***	-0.096***	-0.098***	-0.101***	-0.101***
	(0.012)	(0.012)	(0.012)	(0.012)	(0.012)
Children at home +1	-0.004	-0.004	-0.008	-0.010	-0.008
	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)
German born	-0.057***	-0.057***	-0.060***	-0.061***	-0.062***
	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)
House owner	0.114***	0.114***	0.116***	0.115***	0.115***
	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)
Mean (y_i)	0.403***	0.403***	0.414***	0.408***	0.407***
	(0.015)	(0.015)	(0.015)	(0.015)	(0.015)
Mean (*Education*)	-0.113**	-0.113**	-0.114**	-0.125***	-0.123**
	(0.048)	(0.048)	(0.048)	(0.048)	(0.048)
Mean (*Adults*)	-0.312***	-0.312***	-0.315***	-0.312***	-0.313***
	(0.021)	(0.021)	(0.021)	(0.021)	(0.021)
Mean (*Children*+1)	-0.036***	-0.036***	-0.035***	-0.035***	-0.035***
	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)
Easterner	-0.300***	-0.300***	-0.300***	-0.298***	-0.293***
	(0.013)	(0.013)	(0.013)	(0.012)	(0.012)
Observations	278004	278004	278004	278004	278004

All models include individual random effects and fixed time effects. Cluster robust standard errors in parentheses. * p< 0.1, ** p< 0.05, *** p<0.01

Table 7.4 Evidence of Income Comparisons. West Sample GSOEP 1992-2008.

Explanatory Variable	General Satisfaction				
	Model A	**Model B**	**Model C**	**Model D**	**Model E**
Resources Variable					
y_i	0.124***	-0.017	-0.014	-0.012	-0.023
	(0.010)	(0.032)	(0.032)	(0.026)	(0.027)
Relative Standing Variables					
$\bar{y}_r$	-0.142***				
	(0.031)				
$y_i - \bar{y}_r$		0.142***			
		(0.031)			
I_1			0.023		
			(0.035)		
I_2			-0.199***		
			(0.032)		
$A_1(y_i)$				-0.421***	-0.715***
				(0.059)	(0.098)
$A_2(y_i)$				-0.030**	0.358
				(0.013)	(0.326)
$A_1^2(y_i)$					0.212***
					(0.036)
$A_2^2(y_i)$					-0.382
					(0.334)
Socio-demographic Characteristics					
Male	-0.042***	-0.042***	-0.044***	-0.044***	-0.045***
	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)
Age	-5.163***	-5.163***	-5.170***	-5.325***	-5.107***
	(0.272)	(0.272)	(0.272)	(0.273)	(0.282)
Age squared	0.661***	0.661***	0.662***	0.683***	0.652***
	(0.037)	(0.037)	(0.037)	(0.037)	(0.039)
Living together	0.205***	0.205***	0.193***	0.195***	0.191***
	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)
Education	0.257***	0.257***	0.253***	0.243***	0.254***
	(0.045)	(0.045)	(0.045)	(0.045)	(0.045)
Unemployed	-0.416***	-0.416***	-0.407***	-0.411***	-0.406***
	(0.017)	(0.017)	(0.017)	(0.017)	(0.017)
Worker	0.027**	0.027**	0.023**	0.024**	0.024**
	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)
Adults at home	-0.064***	-0.064***	-0.066***	-0.061***	-0.068***
	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)
Children at home +1	-0.023*	-0.023*	-0.028**	-0.025**	-0.028**
	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)
German born	-0.052***	-0.052***	-0.055***	-0.056***	-0.057***
	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)
House owner	0.127***	0.127***	0.128***	0.126***	0.126***
	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)
Mean (y_i)	0.374***	0.374***	0.386***	0.383***	0.377***
	(0.017)	(0.017)	(0.017)	(0.017)	(0.017)
Mean (*Education*)	-0.024	-0.024	-0.026	-0.010	-0.028
	(0.053)	(0.053)	(0.053)	(0.053)	(0.053)
Mean (*Adults*)	-0.278***	-0.278***	-0.281***	-0.285***	-0.278***
	(0.024)	(0.024)	(0.024)	(0.024)	(0.024)
Mean (*Children*+1)	-0.032***	-0.032***	-0.031***	-0.034***	-0.031***
	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)
Observations	205908	205908	205908	205908	205908

All models include individual random effects and fixed time effects. Cluster robust standard errors in parentheses.
* p< 0.1, ** p< 0.05, *** p<0.01.

Table 7.5 Evidence of Income Comparisons. East Sample GSOEP 1992-2008.

Explanatory Variable	General Satisfaction				
	Model A	**Model B**	**Model C**	**Model D**	**Model E**
Resources Variable					
y_i	0.215***	-0.067	-0.067	0.025	-0.026
	(0.018)	(0.064)	(0.064)	(0.052)	(0.054)
Relative Standing Variables					
$\bar{y}_r$	-0.282***				
	(0.062)				
$y_i - \bar{y}_r$		0.282***			
		(0.062)			
I_1			0.237***		
			(0.071)		
I_2			-0.306***		
			(0.065)		
$A_1(y_i)$				-0.420***	-0.669***
				(0.108)	(0.186)
$A_2(y_i)$				0.058	-0.734
				(0.036)	(0.488)
$A_1^2(y_i)$					0.323***
					(0.103)
$A_2^2(y_i)$					0.875*
					(0.508)
Socio-demographic Characteristics					
Male	-0.034*	-0.034*	-0.034*	-0.034*	-0.032*
	(0.018)	(0.018)	(0.018)	(0.018)	(0.018)
Age	-5.965***	-5.965***	-5.937***	-6.015***	-5.945***
	(0.479)	(0.479)	(0.480)	(0.481)	(0.481)
Age squared	0.768***	0.768***	0.764***	0.776***	0.768***
	(0.066)	(0.066)	(0.066)	(0.066)	(0.066)
Living together	0.095***	0.095***	0.090***	0.089***	0.087***
	(0.022)	(0.022)	(0.022)	(0.022)	(0.022)
Education	0.570***	0.570***	0.568***	0.561***	0.559***
	(0.095)	(0.095)	(0.095)	(0.095)	(0.095)
Unemployed	-0.366***	-0.366***	-0.363***	-0.366***	-0.367***
	(0.023)	(0.023)	(0.023)	(0.023)	(0.023)
Worker	0.046**	0.046**	0.047**	0.044**	0.043**
	(0.020)	(0.020)	(0.020)	(0.020)	(0.020)
Adults at home	-0.166***	-0.166***	-0.167***	-0.168***	-0.170***
	(0.024)	(0.024)	(0.024)	(0.024)	(0.024)
Children at home +1	0.060***	0.060***	0.057***	0.057***	0.070***
	(0.021)	(0.021)	(0.021)	(0.021)	(0.021)
German born	0.060	0.060	0.058	0.059	0.061
	(0.079)	(0.079)	(0.079)	(0.079)	(0.079)
House owner	0.089***	0.089***	0.090***	0.089***	0.090***
	(0.018)	(0.018)	(0.018)	(0.018)	(0.018)
Mean (y_i)	0.593***	0.593***	0.598***	0.590***	0.591***
	(0.032)	(0.032)	(0.032)	(0.032)	(0.032)
Mean (*Education*)	-0.398***	-0.398***	-0.397***	-0.449***	-0.427***
	(0.111)	(0.111)	(0.111)	(0.110)	(0.110)
Mean (*Adults*)	-0.507***	-0.507***	-0.510***	-0.508***	-0.511***
	(0.043)	(0.043)	(0.043)	(0.043)	(0.043)
Mean (*Children*+1)	-0.061***	-0.061***	-0.060***	-0.060***	-0.064***
	(0.017)	(0.017)	(0.017)	(0.017)	(0.017)
Observations	72096	72096	72096	72096	72096

All models include individual random effects and fixed time effects. Cluster robust standard errors in parentheses.
* p< 0.1, ** p< 0.05, *** p<0.01

Table 7.6. Marginal Effects – Ordered Probit for the German Sample 2008.

	GS = 0	GS = 1	GS = 2	GS = 3	GS = 4	GS = 5	GS = 6	GS = 7	GS = 8	GS = 9	GS = 10
Model A											
y_i	-0.029***	-0.034***	-0.101***	-0.194***	-0.215***	-0.544***	-0.358***	-0.201***	0.770***	0.611***	0.294***
	(0.004)	(0.004)	(0.008)	(0.012)	(0.013)	(0.029)	(0.019)	(0.013)	(0.040)	(0.032)	(0.016)
$\bar{y}_r$	0.013***	0.015***	0.046***	0.088***	0.098***	0.247***	0.163***	0.091***	-0.350***	-0.278***	-0.133***
	(0.004)	(0.005)	(0.014)	(0.027)	(0.030)	(0.075)	(0.049)	(0.028)	(0.106)	(0.084)	(0.040)
Model B											
y_i	-0.016***	-0.018***	-0.054***	-0.106***	-0.117***	-0.297***	-0.195***	-0.110***	0.420***	0.333***	0.160***
	(0.005)	(0.005)	(0.015)	(0.028)	(0.031)	(0.077)	(0.051)	(0.029)	(0.109)	(0.087)	(0.042)
$y_i - \bar{y}_r$	-0.013***	-0.015***	-0.046***	-0.088***	-0.098***	-0.247***	-0.163***	-0.091***	0.350***	0.278***	0.133***
	(0.004)	(0.005)	(0.014)	(0.027)	(0.030)	(0.075)	(0.049)	(0.028)	(0.106)	(0.084)	(0.040)
Model C											
y_i	-0.016***	-0.019***	-0.057***	-0.109***	-0.121***	-0.307***	-0.202***	-0.113***	0.435***	0.345***	0.166***
	(0.005)	(0.005)	(0.015)	(0.028)	(0.031)	(0.078)	(0.051)	(0.029)	(0.110)	(0.087)	(0.042)
I_1	-0.001*	-0.001*	-0.003**	-0.006**	-0.007**	-0.017**	-0.011**	-0.006**	0.025**	0.019**	0.009**
	(0.000)	(0.001)	(0.002)	(0.003)	(0.003)	(0.009)	(0.006)	(0.003)	(0.012)	(0.010)	(0.005)
I_2	0.001***	0.002***	0.005***	0.010***	0.011***	0.028***	0.018***	0.010***	-0.039***	-0.031***	-0.015***
	(0.000)	(0.001)	(0.001)	(0.003)	(0.003)	(0.008)	(0.005)	(0.003)	(0.011)	(0.009)	(0.004)
Model D											
y_i	-0.020***	-0.024***	-0.071***	-0.137***	-0.152***	-0.384***	-0.253***	-0.142***	0.544***	0.431***	0.208***
	(0.004)	(0.005)	(0.013)	(0.024)	(0.027)	(0.067)	(0.044)	(0.025)	(0.094)	(0.075)	(0.036)
A_1	0.025***	0.029***	0.087***	0.168***	0.186***	0.472***	0.310***	0.174***	-0.667***	-0.529***	-0.255***
	(0.008)	(0.009)	(0.027)	(0.052)	(0.057)	(0.144)	(0.095)	(0.053)	(0.204)	(0.162)	(0.078)
A_2	0.000	0.000	0.001	0.003	0.003	0.007	0.005	0.003	-0.010	-0.008	-0.004
	(0.002)	(0.002)	(0.007)	(0.014)	(0.016)	(0.040)	(0.026)	(0.015)	(0.057)	(0.045)	(0.022)
Model E											
y_i	-0.016***	-0.018***	-0.056***	-0.108***	-0.120***	-0.304***	-0.200***	-0.112***	0.430***	0.341***	0.164***
	(0.004)	(0.005)	(0.014)	(0.026)	(0.028)	(0.071)	(0.047)	(0.027)	(0.100)	(0.080)	(0.038)
A_1	0.040**	0.047**	0.139**	0.268**	0.298**	0.756**	0.497**	0.279**	-1.069**	-0.848**	-0.408**
	(0.020)	(0.023)	(0.067)	(0.128)	(0.142)	(0.358)	(0.236)	(0.132)	(0.507)	(0.402)	(0.193)
A_2	0.083*	0.097*	0.290*	0.559*	0.621*	1.575*	1.035*	0.581*	-2.227*	-1.766*	-0.849*
	(0.050)	(0.057)	(0.168)	(0.323)	(0.358)	(0.909)	(0.598)	(0.336)	(1.285)	(1.018)	(0.490)
A_1^2	-0.023*	-0.027*	-0.080*	-0.153*	-0.171*	-0.432*	-0.284*	-0.159*	0.612*	0.485*	0.233*
	(0.012)	(0.014)	(0.043)	(0.082)	(0.091)	(0.230)	(0.151)	(0.085)	(0.326)	(0.258)	(0.124)
A_2^2	-0.089*	-0.104*	-0.309*	-0.595*	-0.662*	-1.677*	-1.103*	-0.618*	2.372*	1.881*	0.904*
	(0.051)	(0.059)	(0.173)	(0.332)	(0.368)	(0.935)	(0.615)	(0.346)	(1.321)	(1.047)	(0.504)

Estimation results for the year 2008. Number of observations: 17542. Robust standard errors in parentheses. * p< 0.1, ** p< 0.05, *** p<0.01. All the models include the socio-demographic characteristics used in Table 7.3.

Table 7.7. Marginal Effects – Generalized Ordered Probit for the German Sample 2008.

	GS = 0	GS = 1	GS = 2	GS = 3	GS = 4	GS = 5	GS = 6	GS = 7	GS = 8	GS = 9	GS = 10
Model A											
y_i	-0.011	-0.032***	-0.102***	-0.229***	-0.183***	-0.753***	-0.407***	-0.073	0.972***	0.633***	0.184***
	(0.007)	(0.009)	(0.018)	(0.028)	(0.032)	(0.059)	(0.064)	(0.085)	(0.092)	(0.057)	(0.033)
$\bar{y}_r$	0.038	0.007	0.034	0.108	0.363***	0.152	0.176	-0.092	-0.480*	-0.297*	-0.009
	(0.032)	(0.031)	(0.055)	(0.089)	(0.102)	(0.175)	(0.187)	(0.243)	(0.262)	(0.162)	(0.097)
Model B											
y_i	0.027	-0.025	-0.068	-0.120	0.181*	-0.601***	-0.231	-0.165	0.491*	0.337**	0.174*
	(0.034)	(0.034)	(0.057)	(0.093)	(0.106)	(0.182)	(0.194)	(0.252)	(0.272)	(0.168)	(0.098)
$y_i - \bar{y}_r$	-0.038	-0.007	-0.034	-0.108	-0.363***	-0.152	-0.176	0.092	0.480*	0.297*	0.009
	(0.032)	(0.031)	(0.055)	(0.089)	(0.102)	(0.175)	(0.187)	(0.243)	(0.262)	(0.162)	(0.097)
Model C											
y_i	0.023	-0.028	-0.080	-0.125	0.178*	-0.602***	-0.222	-0.134	0.517*	0.318*	0.155
	(0.034)	(0.034)	(0.057)	(0.094)	(0.107)	(0.183)	(0.195)	(0.253)	(0.272)	(0.168)	(0.097)
I_1	-0.001	0.002	0.006	-0.003	-0.029**	-0.005	-0.027	-0.020	0.033	0.025	0.018*
	(0.004)	(0.004)	(0.007)	(0.011)	(0.012)	(0.021)	(0.022)	(0.029)	(0.031)	(0.018)	(0.010)
I_2	0.004	0.001	0.006	0.013	0.039***	0.019	0.014	-0.020	-0.054**	-0.034**	0.010
	(0.003)	(0.003)	(0.006)	(0.009)	(0.010)	(0.018)	(0.019)	(0.025)	(0.027)	(0.017)	(0.010)
Model D											
y_i	0.023	-0.044	-0.104**	-0.179**	0.066	-0.576***	-0.190	-0.142	0.535**	0.416***	0.195**
	(0.026)	(0.028)	(0.046)	(0.074)	(0.083)	(0.156)	(0.166)	(0.215)	(0.235)	(0.145)	(0.082)
A_1	0.010*	0.001	0.008	0.018	0.068***	0.055	0.039	-0.041	-0.123**	-0.059*	0.023
	(0.005)	(0.006)	(0.010)	(0.016)	(0.018)	(0.034)	(0.036)	(0.047)	(0.051)	(0.032)	(0.019)
A_2	0.001	0.003*	0.006**	0.004	-0.000	0.005	-0.015	-0.014	0.001	0.001	0.008**
	(0.001)	(0.002)	(0.003)	(0.004)	(0.005)	(0.010)	(0.011)	(0.012)	(0.014)	(0.007)	(0.004)
Model E											
y_i	0.026	-0.041	-0.106**	-0.153**	0.101	-0.409**	-0.135	-0.175	0.347	0.376**	0.170**
	(0.027)	(0.029)	(0.049)	(0.078)	(0.088)	(0.166)	(0.178)	(0.228)	(0.251)	(0.152)	(0.085)
A_1	0.005	-0.004	0.019	0.075*	0.178***	-0.012	0.033	-0.163	-0.068	-0.085	0.022
	(0.010)	(0.013)	(0.025)	(0.039)	(0.045)	(0.082)	(0.085)	(0.112)	(0.122)	(0.074)	(0.044)
A_2	0.029	0.033	-0.035	-0.041	-0.178	0.578***	0.156	0.156	-0.601*	-0.035	-0.062
	(0.036)	(0.036)	(0.069)	(0.106)	(0.123)	(0.218)	(0.233)	(0.302)	(0.332)	(0.202)	(0.114)
A_1^2	0.001	0.007	-0.033	-0.476*	-0.808***	-0.020	-0.131	0.952	0.151	0.273	0.083
	(0.066)	(0.087)	(0.167)	(0.254)	(0.294)	(0.535)	(0.559)	(0.741)	(0.805)	(0.495)	(0.298)
A_2^2	-0.298	-0.312	0.434	0.428	1.745	-5.992***	-1.786	-1.660	6.296*	0.419	0.727
	(0.371)	(0.370)	(0.707)	(1.083)	(1.263)	(2.244)	(2.406)	(3.104)	(3.424)	(2.076)	(1.169)

Estimation results for the year 2008. Number of observations: 17542. Robust standard errors in parentheses. * p< 0.1, ** p< 0.05, *** p<0.01. All the models include the socio-demographic characteristics used in Table 7.3.

Table 7.8. Trade off ratios – Generalized Ordered Probit for the German Sample 2008.

	OP	GOP GS = 0	GS = 1	GS = 2	GS = 3	GS = 4	GS = 5	GS = 6	GS = 7	GS = 8	GS = 9	GS = 10
Model A												
$\bar{y}_r$	0.454^{+}	3.493^{o}	0.223^{o}	0.344^{o}	0.485^{o}	2.009^{+}	0.198^{o}	0.431^{o}	1.065^{o}	0.508^{+}	0.465^{+}	0.052^{o}
	(0.137)	(4.041)	(0.976)	(0.538)	(0.395)	(0.656)	(0.233)	(0.461)	(3.672)	(0.271)	(0.257)	(0.525)
Model B												
$y_i - \bar{y}_r$	0.833^{-}	1.401^{o}	0.287^{o}	0.524^{o}	0.941^{o}	1.991^{+}	0.247^{o}	0.757^{o}	0.516^{o}	1.033^{-}	0.869^{-}	-0.099^{o}
	(0.460)	(0.650)	(1.612)	(1.249)	(1.486)	(0.644)	(0.362)	(1.422)	(0.861)	(1.119)	(0.898)	(0.639)
Model C												
I_1	0.056^{-}	0.022^{o}	0.088^{o}	0.075^{o}	0.029^{o}	0.159^{+}	0.008^{o}	0.123^{o}	0.179^{o}	0.069^{o}	0.077^{o}	$0.128^{\times}$
	(0.041)	(0.126)	(0.066)	(0.526)	(0.108)	(0.053)	(0.037)	(0.197)	(0.601)	(0.095)	(0.095)	(0.149)
I_2	0.091^{+}	0.194^{o}	0.056^{o}	0.712^{o}	0.112^{o}	0.219^{-}	0.031^{o}	0.063^{o}	0.157^{o}	0.109^{+}	0.105^{+}	0.062^{o}
	(0.047)	(0.158)	(0.181)	(0.119)	(0.156)	(0.079)	(0.038)	(0.138)	(0.173)	(0.109)	(0.105)	(0.036)
Model D												
A_1	0.123^{+}	$0.433^{\times}$	0.029^{o}	0.080^{o}	0.113^{o}	$0.997^{\times}$	0.094^{o}	0.211^{o}	0.294^{o}	0.239^{+}	0.141^{+}	0.118^{o}
	(0.056)	(0.285)	(0.152)	(0.132)	(0.131)	(0.976)	(0.081)	(0.364)	(0.258)	(0.198)	(0.121)	(0.061)
A_2	0.002^{o}	0.029^{o}	$0.065^{\times}$	0.062^{+}	0.024^{o}	0.007^{o}	0.008^{o}	0.079^{o}	0.109^{o}	0.003^{o}	0.004^{o}	0.040^{-}
	(0.010)	(0.075)	(0.034)	(0.024)	(0.019)	(0.072)	(0.015)	(0.111)	(0.245)	(0.027)	(0.018)	(0.033)
Model E												
A_1	0.248^{+}	0.211^{o}	0.101^{o}	0.178^{o}	0.489^{+}	$1.756^{\times}$	0.029^{o}	0.245^{o}	0.929^{o}	0.197^{o}	0.226^{o}	0.130^{o}
	(0.149)	(0.373)	(0.301)	(0.277)	(0.421)	(1.418)	(0.196)	(0.796)	(1.171)	(0.421)	(0.245)	(0.240)
A_2	0.518^{+}	1.135^{o}	0.802^{o}	0.332^{o}	0.269^{o}	1.753^{o}	1.414^{+}	1.153^{o}	0.888^{o}	$1.734^{\times}$	0.094^{o}	0.362^{o}
	(0.341)	(0.461)	(1.118)	(0.644)	(0.683)	(2.102)	(0.862)	(2.560)	(2.269)	(1.737)	(0.547)	(0.726)
A_1^2	1.422^{-}	0.056^{o}	0.171^{o}	0.315^{o}	3.101^{-}	$7.961^{\times}$	0.049^{o}	0.972^{o}	5.427^{o}	0.436^{o}	0.727^{o}	0.488^{o}
	(0.869)	(2.534)	(2.098)	(1.604)	(2.471)	(7.087)	(1.311)	(4.161)	(7.901)	(2.373)	(1.372)	(1.790)
A_2^2	5.515^{-}	11.503^{o}	7.606^{o}	4.102^{o}	2.794^{o}	17.199^{o}	14.651^{-}	13.212^{o}	9.463^{o}	$18.164^{\times}$	1.115^{o}	4.269^{o}
	(3.564)	(16.753)	(11.368)	(6.557)	(6.953)	(0.000)	(9.013)	(28.074)	(23.868)	(18.293)	(5.643)	(7.590)

Estimation results for the year 2008. All the models include the socio-demographic characteristics used in Table 7.3. Estimated standard errors in parentheses. The trade-off ratio of significant (at least at 10%) marginal income and relative standing effects is marked +/- (if positive/negative). If the marginal income effect is non-significant, the ratio is marked ×. If the marginal effect of the relative standing variable is not significant, the ratio is marked o.

8. CONCLUSIONES.

En este documento se han presentado los resultados de la investigación realizada sobre algunos de los determinantes del bienestar individual, aportando con ello evidencia empírica al análisis de la noción de utilidad en economía, dando respuesta a viejos interrogantes y abriendo la puerta al desarrollo de nuevas teorías.

Usando datos de corte transversal para América Latina, se han contrastado econométricamente algunos tópicos explorados previamente para países industrializados y se han presentado evidencias de la importancia de otros menos estudiados. El capítulo 5 está dedicado al análisis de la relación entre las características socioeconómicas individuales y el bienestar subjetivo, con especial atención en el efecto del autoempleo como una categoría heterogénea. En el capítulo 6 se estudian las interacciones sociales como un proceso que incluye las comparaciones y las relaciones sociales. Los resultados econométricos en ambos casos son obtenidos a partir del Latinobarómetro del año 2007.

En esta investigación también se usan medidas de bienestar subjetivo para aportar evidencia complementaria sobre el efecto de las comparaciones de ingreso en la utilidad individual. Para ello, en el capítulo 7 se usa la información del Panel Socio-económico Alemán y se estudian econométricamente dos posibles fuentes de asimetría en las comparaciones, la primera basada en el ingreso promedio del grupo de referencia y la segunda considerando toda la distribución del ingreso del grupo de

comparación. En este caso, la calidad y cantidad de la información disponible permiten controlar posibles sesgos de personalidad con la utilización de técnicas para datos de panel, así como la consideración de estructuras econométricas más generales que hacen posible identificar posible heterogeneidad en los efectos encontrados. A continuación se presentan las conclusiones de cada una de las aportaciones.

El capítulo 5 estudia la relación entre el estatus laboral individual y otras características socioeconómicas con dos medidas de bienestar auto-reportado: satisfacción con la vida y satisfacción con el trabajo. Usando información del Latinobarómetro 2007 se estiman modelos probit ordenados. Los resultados de este análisis son complementarios a los encontrados en estudios previos sobre América Latina (Graham y Petinato, 2001; Graham y Felton, 2005). En concordancia con la evidencia de estudios anteriores, cuando se analiza la diferencia en la satisfacción auto-reportada entre trabajadores asalariados y autónomos, se encuentra que en América Latina los trabajadores autónomos no parecen estar más satisfechos con su vida y con su trabajo que los trabajadores asalariados.

En este capítulo, se hace un llamado de atención sobre la necesidad de usar categorías laborales más específicas para el análisis de las preferencias laborales en los países latinoamericanos. Teniendo en cuenta que en la categoría *autoempleo* se incluyen profesionales (como médicos, abogados arquitectos, etc.), propietarios de negocio, agricultores y pescadores independientes, así como trabajadores ambulantes, ésta investigación hace uso de la clasificación de autoempleo que es incluida en una de las preguntas de la encuesta Latinobarómetro y estima el efecto desagregado de estos distintos tipos de autoempleo sobre el bienestar subjetivo individual.

Las evidencias encontradas en este capítulo muestran que los autónomos que se desempeñan como trabajadores ambulantes reportan significativamente menor satisfacción con su vida y con su trabajo que los empleados. Por otra parte, en promedio la satisfacción con la vida de los autónomos profesionales y los propietarios de negocios no es significativamente diferente a la reportada por los asalariados. Además, los propietarios de negocios están significativamente más satisfechos con su trabajo que aquellos que están empleados. Desde este punto de vista y comparando

con las evidencias sobre países industrializados, es posible afirmar que en América Latina, la autonomía y flexibilidad de algunos autónomos es considerada una ventaja si se comparan con los trabajadores asalariados. Sin embargo, para los autónomos que sufren condiciones laborales precarias asociadas al subempleo, ser *independientes* no es considerado una fuente de satisfacción, puesto que el efecto negativo del riesgo y la volatilidad del ingreso de este tipo de ocupación parece ser la influencia dominante.

El capítulo 6 incluye las interacciones sociales, entendidas como relaciones y comparaciones sociales, en la estimación de las ecuaciones de satisfacción individual usando también datos del Latinobarómetro 2007. Inicialmente, se analiza el efecto de los contactos sociales y las comparaciones sobre la satisfacción con la vida. Estudios anteriores han mostrado que relaciones sociales frecuentes se asocian con mayor felicidad individual, mientras las comparaciones con la riqueza de otros son consideradas una fuente de insatisfacción. Además de contrastar estas evidencias previas, la principal contribución de este capítulo es el análisis del efecto conjunto de las interacciones sociales, es decir, la importancia de las relaciones sociales como moderadoras o potenciadoras del efecto de la comparación sobre la satisfacción individual.

Los resultados iniciales confirman la importancia de los contactos sociales como uno de los correlativos más fuertes del bienestar subjetivo en América Latina. Así mismo, la evidencia señala que las comparaciones de riqueza tienen un efecto positivo, significativo y no-simétrico sobre el bienestar individual, es decir, el efecto de las comparaciones es diferente para individuos con riqueza superior e inferior con respecto al promedio. Adicionalmente, las estimaciones realizadas muestran que los contactos sociales intensifican el efecto de la comparación sobre el bienestar auto-reportado. El efecto de la diferencia entre la riqueza propia y la del grupo de referencia sobre la satisfacción es mayor para personas con relaciones sociales activas. Cuando la asimetría en las comparaciones es considerada, la evidencia sugiere que aquellos con condiciones materiales inferiores a las del promedio y que participan activamente en redes sociales, perciben como una externalidad positiva la mejora en la riqueza promedio del grupo de referencia.

Teniendo en cuenta estudios anteriores (Duesenberry, 1949; Ferrer-i-Carbonell, 2005) sobre el efecto relativo del ingreso en la utilidad individual, el capítulo 7 presenta los resultados de la contrastación de la hipótesis de ingreso relativo bajo dos enfoques distintos. El primero considera las comparaciones con respecto al ingreso promedio del grupo de referencia. El segundo incorpora la posición del individuo en la distribución del ingreso del grupo de referencia, usando una extensión del modelo de aversión a la desigualdad propuesto por Fehr y Schmidt (1999) en economía del comportamiento. La evidencia empírica en este capítulo se deriva del análisis de las respuestas a la pregunta sobre la satisfacción general en el Panel Socio-económico Alemán de 1992 a 2008.

En línea con previos estudios, los resultados de esta investigación muestran que el bienestar individual se ve influenciado por el ingreso de otros en el grupo de referencia. Adicionalmente, en este análisis se evidencian dos fuentes de asimetría en las comparaciones. Primero, el efecto del ingreso promedio del grupo de referencia sobre el bienestar subjetivo difiere entre individuos con ingresos por encima o por debajo del promedio. Los resultados sugieren que la pérdida de bienestar asociada a tener un ingreso inferior al promedio del grupo de referencia es superior a la correspondiente ganancia de aquellos que tienen un ingreso superior al promedio. Concretamente, un aumento en el ingreso de referencia está asociado a menor satisfacción para aquellos individuos cuyo ingreso es inferior al promedio, pero no tiene ninguna influencia en la satisfacción de los individuos con un ingreso superior al de referencia (en el caso del Oeste de Alemania y para la muestra completa).

La principal contribución del capítulo 7 es el estudio de una segunda fuente de asimetrías. En este capítulo se analiza si el bienestar individual se ve afectado de forma diferente dependiendo de si el individuo se compara con personas más ricas o más pobres que él. Mientras en el caso anterior dentro de cada grupo de referencia se hacia una clasificación ex-ante entre *ricos* y *pobres*, en este caso se construyen dos medidas específicas para cada individuo. Dichas medidas recogen la posición que ocupa el individuo en la distribución del ingreso e informan que tan *privado* o *prospero* es el individuo, en su grupo de referencia, en comparación a todos aquellos con ingresos superiores e inferiores respectivamente. La evidencia empírica sugiere que

aumentos en el ingreso de los más ricos generan un efecto negativo en la felicidad, pero aumentos en el ingreso de los más pobres influyen positivamente el bienestar individual. De esta forma, cambios en el ingreso de otros afectan el bienestar individual de todos los individuos, incluso de aquellos que se encuentran en la parte más alta de la distribución del ingreso en su grupo de referencia. Estos resultados sugieren que la redistribución de riqueza puede tener efectos positivos en el bienestar general de la población.

En el capítulo 7 también se presentan resultados adicionales sobre la heterogeneidad de las influencias del estatus relativo a lo largo de la distribución del bienestar subjetivo, usando modelos probit generalizados. Aunque este análisis se realiza para datos de corte transversal, los resultados preliminares sugieren que el efecto de las comparaciones de ingreso no mantiene la simetría que se asume en los modelos probit ordenados. Por ejemplo, cambios en el ingreso del grupo de referencia afectan la probabilidad de altos niveles de satisfacción, pero no tienen ningún efecto sobre la baja satisfacción. Este análisis preliminar resalta la necesidad de extender el análisis del efecto asimétrico de las comparaciones con el uso de modelos generalizados que permitan estimar de forma más flexible los efectos sobre las probabilidades marginales.

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