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**ADVERSE EFFECTS OF SUFFERING FROM CLINICAL  
DEPRESSION IN THE LABOR MARKET:  
A CHILEAN CASE**

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## **Abstract**

Medical conditions can be very detrimental for individual's development of their daily activities, specially when they influence people's mood states, deterring them from accomplishing their labor goals or the things they would like to do just for fun, in a healthier context. Through this working paper we hope to deliver a useful parsimonious approach aimed to disentangle the impact of having ever suffered from clinical depression in relevant labor market outcomes, such as employment and income from labor. For our salary variable we built a classic OLS model and found that depression accounts for a 18% reduction in income in comparison to healthy people (people without a depression diagnosis in the past). For our second approach, we formulated a probit and a logit model by regressing our unemployment binary variable (that takes the value 1 for individuals prone to be unemployed) against our depression indicator. Our findings suggested a slight 1.8% increasing in the likelihood of being unemployed for people who was ever diagnosed with depression. With these findings we hope to give some support for policy makers to include in their agendas, as a top medical priority, depressive conditions. A final contribution of our findings would be the much greater identified tendency to suffer from depression for females, which naturally would demand differentiated treating between both genders when it comes to policy makers for addressing their efforts to minimize the social cost of this disease, given that public resources are scant (specially for emerging economies) and must therefore be focused on the ones that require them the most.

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## **I. Introduction**

Depression is by far one of the most relevant diseases in the world either in terms of its adverse impact on people's health, happiness or their pockets (income). The first two of these concepts are very hard to measure as any economist would recognize that happiness cannot be measured through our famous "Utility function" due to the fact that this approach can only give us some awareness of ordinal (but none cardinal) dimensions.

So by admitting this restriction, if we believe that every individual's income could serve as a proxy variable for welfare, then it becomes far easier to measure the impact of suffering from a limiting disease in labor market outcomes that could be an impediment for the individual's seeking for happiness. This of course is supposing that you have the correct data and capability to isolate the effects of medical diseases (which is commonly very hard to pull, due to unobserved heterogeneity).

As economists, we were very curious in general about the deterring effects of medical conditions in economical outcomes. This hunger for health economics investigation came from various fronts: First, until now, there was no much elaborated research related to the Health Economics field in Chilean society. To this regard we could only find work related to either pure economics or social protection or adverse effects of diseases in health. We hope then with this paper to make a first kick toward much health economics research left to be done, as a way to motivate other colleagues in though this fascinating field.

Second, we found that depression was one of the most frequent conditions present in Chilean society (specially for women) which encouraged us to try making robust findings

that could possibly serve as empirical support for policy makers to take depression as a first medical priority into their agendas.

In this paper we make an effort (hopefully a good one) to identify the effect of having been diagnosed of any type of depression in some relevant labor market outcomes: income and employment. Specifically, for the first purpose we built a traditional OLS model to isolate the effect of having ever been diagnosed with depression, in income. Regarding our employment variable, we built it as a dichotomic one that takes the value 1 if the given individual is prone to be unemployed, so as to model it as a probit or logit model and therefore to identify the effect of depression in employment.

After controlling for gender, age, age squared, marital status and being a professional, we found that having ever been diagnosed with depression counts for a 18% less perceived income per hour, and increases probability of being unemployed in a modest 1.8%.

The rest of this working paper goes as follows: Section II presents a minimum medical background to develop a little of intuition about depression mechanisms. Section III reviews related research made in the past that served us as a guide and also as a benchmark to make real contributions to academy with this work. Section IV revises some general descriptive statistics that gives us some lights to where or what would be interesting to look for in the data. Section V presents the model and our major findings. Section VI concludes.

## II. Understanding Depression (Background)

Sadness and euphoria are two natural possible mental states in a single person and they constitute a very important part of their regular life time, but nonetheless these states sometimes turn into being more present or observably more frequent than what it supposes to, when this occurs we are often in presence of a mental disorder, such as depression.

Depression is perhaps the most known disease by general population. It is commonly understood as a disease that causes frequent, permanent or last longing mood states related to sadness and lost of interest or capability of enjoying daily life activities that were realized by the diagnosed person before he or she got sick.

However, what we as regular people (not professionals related to the field of medicine) often call depression it many times constitutes no more than an emotional alteration episode triggered by some stressful specific event such as the loss of a relative or as a consequence of other psychiatric illness. In general terms, this pathologies that involve changes in mood states are often characterized by specialists under the name of *Mood Disorders*.

A mood state refers to a long lasting emotion that affects the entire psychical nature of the person under question. Therefore contemporaneous psychiatry has chosen the term “mood disorder” to delimitate this concept to the most important alterations related to emotional life, which are characterized by the long lasting overbounding of the lower limit of mood states (sadness) which has an effect on the conduct or regular functions of the affected individual (Heerlein, 2000).

To continue with, mood disorders can be divided into the following:

- Major depressive disorder
- Dysthymic disorder
- Atypical depression
- Bipolar disorder I
- Bipolar disorder II
- Bipolar disorder, unspecified
- Cyclothymic disorder
- Mood disorder due to medical illness
- Mood disorder induced by ingestion of substances
- Mood disorder, unspecified

Now, in addition to this, as a fundamental to the diagnosis of these disorders, we can also identify what specialists call “*Emotional episodes*” which can be presented in their individual form or in their collective variation, depending of the specific disorder suffered by the individual. These episodes are divided as follows:

- Major depressive episode
- Manic depressive episode
- Mixed episode
- Hypomaniac depression

For the development of this empirical work, we are interested in all of these pathologies which are in practice diagnosed as depression, whether this diagnose is made under the basis of real symptoms or by the common fallacy by which doctors tend to diagnose depression for patients who are actually not really suffering from this disease, which is

done to avoid major reaction crisis by the extreme concern of a patient who is being told that he is sick of some strange unknown mental disorder (in simple words, doctors often diagnose patients with rare mental disorders as if they suffered from depression), so by these terms, patients are usually more familiar with depression disorders and therefore are more reluctant to react adversely to it.

Generally speaking, people who are diagnosed as suffering from depression are in most cases due to have presented a *major depressive episode*. This episode is presented in some of the stages of the *major depressive disorder, dysthymia, bipolar disorder (I and II) and mood disorders induced by ingestion of substances, other medical illnesses or vital danger events*.

The main characteristic of a major depressive episode is a period of at least two weeks in which there is a constant depressed mood state or a lack of interest or capability of enjoying almost all regular life activities. The subject in question must also experiment at least other four symptoms of a specific list which includes: changes in appetite or physical weight, alteration of dream hours and psychomotor activity, lack of energy, deteriorated self-esteem or guilt, cognitive thinking difficulties related with thinking, concentrate or making decisions, and constant thoughts related with death or suicidal plans. In addition to this, it must be accompanied by a significant clinical discomfort and deterioration in social, labor or other areas self perceived as important in the regular activity of the individual. (DSM-IV-TR, 2004).

Factors that could trigger Major depression are of diverse nature, and in many of them there is still not heavy convincing evidence that could confirm they act really by causing this

pathology. Within the main triggering factors we can find: genetics (family history), biologies (brain lesions), chronobiologies (alteration of dream), seasonal (autumn-winter / spring-summer), personality of the individual and vital events (lost of job, death of a relative or a closest, and so on).

Before getting to see the distribution of this disease in general population, it is of major importance to notice or outstand the fact that nowadays the definition known as *endogenous depression* is no longer used by specialists. It has been studied, but not fully proved, that every depressive episode involves a biological alteration in the individual in which the change in mood state is presented. Therefore, in relation with diagnosis of depression, it is irrelevant if it is caused by external factors or reasons inherent to the individual, symptoms and treatment are similar for both.

- International evidence

Mood disorders are the psychiatric most frequent disease within general community. These pathologies have a strong negative impact over activities and life quality of individuals affected by them, in a way that could be comparable to diabetes or heart diseases sequels (Kaplan & Sadock, 2009).

Estimations made by the World Health Organization (WHO) by the year 2002 showed that 154 millions of people in the world suffer from depression, and the burden that these types of illnesses represent is rapidly increasing. Indeed, it has been estimated that by the year 2020 depression would occupy the second place in the ranking of global burden of diseases,

or in other words, it would be the second most common global disease.

According to the Global Burden of Disease (GBS) 2001 study made by the Harvard University and the WHO, depression itself represents a 12.15% of the total of the Discapacity Adjusted Life Years (DALYS) and occupied the third place in the global burden of diseases.

Moreover, the GBD conducted with data of year 2004 showed a world prevalence of depression estimated at the amount of 151.5 millions of people. The deepest prevalence were found in the Asian Southeast and in the Western Pacific, as it is shown on Table II.1.

**Table II.1: Prevalence of Depression Worldwide (people in millions) by region, year 2004**

<b>Around the world</b>	<b>Africa</b>	<b>America</b>	<b>Mediterranean East</b>	<b>Europe</b>	<b>Asian Southeast</b>	<b>Western Pacific</b>
151,2	13,4	22,7	12,4	22,2	40,9	39,3

**Source:** Global Burden of Disease

Another study showed that psychiatric disorders are the most important cause of disability, representing around a third of the Discapacity Lost Life Years (DLLYS), in population with 15 years old and more. The weight of the burden of psychiatric disorders is high for men and women as well, but for the later it is a 50% higher than for the male opposing party, as it is shown on Table II.2.

**Table II.2: Main causes of Disability Lost Life Years around the world, by sex, year 2004**

MEN			WOMEN		
Cause	DLLYS (millions)	% of total DLLYS	Cause	DLLYS (millions)	% of total DLLYS
1. Depression	24,3	8,31	1. Depression	41,0	13,4
2. Abusing and dependency in alcoholism	19,9	6,8	2. Refraction problems (eyes illnesses)	14,0	4,6
3. Loss of hearing (only adults)	14,1	4,8	3. Loss of hearing (only adults)	13,3	4,3
4. Refraction problems (eyes illnesses)	13,8	4,7	4. Cataracts	9,9	3,2
5. Schizophrenia	8,3	2,8	5. Osteoarthritis	9,5	3,1
6. Cataracts	7,9	2,7	6. Schizophrenia	8,0	2,6
7. Bipolar disorder	7,3	2,5	7. Anemia	7,4	2,4
8. Pulmonary obstructive chronic disease	6,9	2,4	8. Bipolar disorder	7,1	2,3
9. Asthma	6,6	2,2	9. Asphyxia and perinatal trauma	6,9	2,3
10. Normal Falls	6,3	2,2	10. Alzheimer's and other dementia diseases	5,8	1,9

**Source:** Global Burden of Disease study.

Major depression is 2 to 3 times more frequent in females over males in almost every culture. The explanation for this could be accounted for factors that go from the social ones, as the society role undertaken by each of the genders, and family relations, to biological-

hormonal factors, as for instance, postpartum depression. In the group of patients diagnosed with depression, prevalence in women is of about a 66% of the total population compared to men (Heerlein, 2000). In the case of bipolar disorders, the population is similarly distributed between male and females.

The major depressive episode starts to be observed in average between the ages of 30 and 35, and in the absence of a related family history, it could be presented a few years later. Initiation of bipolar disorders spins around the neighborhood of the twenties, and men usually present an initiation 4 to 5 years earlier than women (Sadock, Sadock and Ruiz, 2009).

In general terms, Major Depression is more frequently presented in persons who are either single, separated, widow or widower, or a linear combination of some or all of the above, however, a single female is less likely to fall into depression than a single male. In Bipolar Disorder something similar takes place, although in this case it is assumed that marriage separation is the social outcome of the disease.

A very relevant factor of which we have not yet said anything is the socioeconomic status. Depressive Disorder and Bipolar Disorder had both been defined as variables which are independent of socioeconomic reality. Although some studies have found a weak correlation between these two variables, the main reason of these findings is that subjects with a lower socioeconomic level tend at the same time to have lower educational attainment, lower level of income and therefore lower quality of life, as well as a higher rate (or long lasting) of unemployment. It has been demonstrated in previous studies that

the proportion of people who suffers from Major Depression is approximately 3 times higher for unemployed individuals in relation to the ones who do have a job. Regardless of this fact, there is still not enough evidence to corroborate this assumptions and it is still of general consideration for specialists to assume that Depression is still independent of socioeconomic status, at least until it is prove otherwise.

- Evidence from Chile

As this work is conduct using a Chilean representative data sample it becomes useful to analyze the Chilean context in relation to the distribution of depression in the population. In Chile epidemiology related to major depressive episodes is similar to the one observed in the rest of the world. This means that is more frequent for women than men, it is more frequently presented in the ages between the third and fourth life decade and it is most commonly observed in single (not married) people. Finally, the socioeconomic factor appears to be independent of the pathology.

Nowadays, in this country there are two official prevalence studies<sup>1</sup> of psychiatric disorders in general population. One is the study of Common Mental Disorders in Santiago (“*Estudio de Trastornos Mentales comunes en Santiago*”), which delivers indicators of prevalence in the period of a week for depressive episodes, which includes the main categories. The second one is the Chilean Study of Prevalence in psychiatric pathologies (“*Estudio chileno de prevalencia de patología psiquiátrica*”), which is conducted in four big Chilean cities

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<sup>1</sup> Prevalence is defined as the number of existing cases of a certain disease or condition in a certain population at a given time divided by the numbers of individuals in the population (I.e.: Prevalence of life, total period is total life)

including Santiago, the capital. The main results of this last study are provided in Table II.3.

**Table II.3: Prevalence of Life and 6 months of depressive disorders in Chile, according to DSM III-R**

Depressive disorder	Men		Women		Total	
	life	6 months	life	6 months	life	6 months
Major Depressive Disorder	6,4	3,0	11,3	6,0	9,0	4,6
Dysthymia	3,5	1,5	12,1	4,8	8,0	3,2

**Source:** Chilean Study of Prevalence in psychiatric pathologies

There are also other studies in specific populations, such as the study of prevalence of Depressive Disorders (*“Estudio de prevalencia de Trastornos Depresivos DSM III-R”*) conducted in patients of a general polyclinic, which showed a prevalence of 14.7% for men and 30.3% for women.

By the year 1996, the first Study of Burden of Diseases (*“Estudio de Carga de Enfermedad”*) conducted in Chile was realized, which revealed that depressive manifestations occupied the 10th place within the main causes of discapacity for general population, the unit of measure used was the Discapacity Adjusted Life Years (DALYS), which includes life years lost due to premature death and life years lost due to discapacity. The data, disaggregated by sex, revealed that depressive disorders had taken the second place within the female gender. Considering only the Discapacity Lost Life Years (DLLYS) depressive disorders occupied the third general place and the first one for women.

More recently, the Study of Burden of Diseases and Attributable Burden (*“Estudio de Carga de Enfermedad y Carga Atribuible”*) conducted with data of the year 2004, showed that unipolar depressive disorders, are accountable for the 4.5% of the total of the DALYS. In relation with the subgroup of diseases, either for age group 20-44 or 45-59, the first subgroup of causing of DALYS was attributed to psychiatric conditions, which burden is influenced mainly by mood disorders and alcohol dependency.

### **III. Empirical considerations and previous literature**

As we well previously declared, our topic of interest or working focus is the relevance of existence or prevalence of depression in society and the social cost for which this particular disease could be accountable for, and well, given that we are economists, our interest specifically comes from identifying the direction and impact through which clinical diagnosed depression might affect different outcomes in the labor market for an average affected individual, given that clinical depression, when defined as a medical condition that alters mood states daily, it is expected to alter labor market outcomes for the sick individual as well. Well documented by Frijters, Johnson y Shields (2010), is the fact that apart from a potential or possible loss of income due to the non participation in the labor market or the marked absenteeism provoked by this disease, it is also possible to identify a loss of daily structure (habits), sense or proposal of life and opportunities in society. The erosion of life at the working place could subsequently exacerbate even more the already deteriorated mental health of an individual who suffers from depression.

Now, as stated in the previous sector, there are numerous types of depressions, which are triggered by diverse reasons and due to different contexts, so it is to be expected that they present differences in the way by which they could affect our field of study (Health, labor economics). We are not particularly interested in these differences, or well, we actually are, but for the sake of this working paper, these differences would not be studied, because it could become very complex to figure out which kind of results would be more common in one type of depression or the other, mainly for two reasons:

First, even for the most specialized experts, given that they have come to be aware of general medical consensus and have common notions regarding features that are typically attributable to either type of depression, or that they might actually know for certain which type of depression a certain patient is suffering from, it is very hard for them to know for certain in which proportion you would observe each of these features in each affected patient. For instance, if a certain expert determines correctly that a certain patient suffers from Manic depression and another one is suffering from, let us say, Bipolar depression, just by knowing this (as what one could observe in a limited data base), it would be very hard for him to find out in which proportion would one of those patients be affected by dream alteration or appetite disorders (or vice versa) or how these particular features would affect labor market outcomes for each specific case.

So when confronting this problem, a medical expert can only hope to make estimations of what we cannot see well enough (as the human mind) and so an economist can only hope to make estimations about the estimations that this medical expert could make.

Second, given that our field of study corresponds to economics and the difficulties of making effective differentiations of the types of depression it even persists for the most specialized medical experts of different Health fields of study (such as psychology, psychiatry, endocrinology, and so on) we will, in a humble way, limit ourselves to what concerns us (estimate impacts or effects of certain events on other variables) and what we can measure in friendly numbers for economists.

The main idea is to try to understand the economical and statistical language delivered by the labor market, regarding the potential relevance of taking care or treating mental disorder

conditions of individuals (in this case, depression) in their own life (because one could also try to measure the effect of a single individual depression in the life of others but that could be the subject for another working paper), but measuring it in potential (or real) losses of income linked to the suffering of depression, degrading in levels of employment or continuity in the labor market.

Third, even if we would like to differentiate types of depression and make the assumption that after we do this, they would all be correctly differentiated, our data base would not allow to do this work, and this is due the fact that we can only observe people who suffers from the most common or relevant diseases for Chilean society or at least for the master minds that created the survey, so we can only account for limited information of which person suffers from which kind of disease from a list of important diseases, in which there is only one type of depression (depression, unspecified).

This information is captured by a representative Chilean data set obtained from de Social Protection Survey (“*Encuesta de Protección Social*” *EPS*) with several waves, which we use in this work and will be described in the next section and beyond. Regarding this matter, we could have used a different data set, which contained more specificity in relation to the data gathering of different types of depression suffered by the individuals surveyed, but the more specific medical information of this type that we could find it was only reduced to small and none representative samples and very difficult to link to relevant labor market information as the one we are trying to address, for example, data from an specific hospital or medical center, in relation to this regard, the *EPS* allow us to make useful inferences about the whole population minimizing the likelihood of bias, given its representativity and great amount of observations. Another advantage of our sample

relative to another one which could contain more specific medical information regarding different types of depression, is that our data allows us to cross one individual's specific disease with its specific job, salary, employment and many other demographic variables which we could use either as a control variable or as an instrument for an Instrumental Variables approach (IV), variables who could help us building a better background or helping us to understand better economical correlations that we could observe. This of course would be explained more exhaustively in the Data section (next section).

Therefore, we will address our analysis to identify the impact of just suffering from depression or being a healthy person (controlling for relevant observable variables such as sex, socioeconomic status, age, industry and so on) in its relevant outcomes related with the labor market, such as income and employment. Specificity of each type of depression would be ignored under the assumption that even if each type are different between each other, they have in common the fact that they all generate negative impacts in the labor market through relatively similar channels, which are the alteration of mood or sense of life (assumption that can be made without being an expert in the topic of mental disorders).

There have been many attempts of estimating the social cost that could be associated to mental illness and some other specific conditions like depression or alcohol abuse (the cost that could be attributed to labor market). These estimates range from US\$50 to US200 billion per year for the US (Rice et al., 1990; Harwood et al., 2000; Greenberg et al., 2003 and Kessler et al., 2008) which are large amounts that should not be underestimated. Depression itself can be understood as an extremely important factor of instability or precarious outcomes in the labor market if we think it in the way the specialists define it, which suggests that a mood disorder is very likely to converge in an alteration of the labor

performance of the one affected by it, this is supported also by the fact that this illness affect people through a large amount of hours, each day of a week, which makes it likely to act at least some hours in the labor period of each day.

The great difficulties that come up when trying to measure the impact of depression in the labor market reside in the high levels of inverse causality or unobserved individual heterogeneity. It has been well documented by experts in medical fields that depression could itself perfectly explain bad outcomes in the labor market if diagnosed (assuming that the diagnose takes place when the disease really appears and not too much time after) before entering a specific labor market or could well occur that a given individual comes into a depressive state due to the fact that he just does not feels attracted to his job (in this sense it would be very useful to control for differences between industries, type of work, socioeconomic status and education), in which this person it is obligated to remain at least 45 hours a week (Generally speaking Chile presents working journeys duration of at least 45 hours a week, which in practice or unofficial counting tend to be much larger), therefore by staying at the work place a high percentage of daily life, working in a position or department which is not of the taste of the individual in question, it becomes more likely for depression to be triggered for this particular individual in a hard working (or at least last longing labor journey) society such as the Chilean one.

A third explanation could be that a given person were diagnosed for depression due to an exogenous event that took place while this person was already participating in the labor market and that is related neither with having suffered from depression before or the subjective attractiveness of his job (for instance, a person which just passed through a bad break up or marriage ending).

In this context, some types of depression are more easy to identify as exogenous than others, given that they seem to appear more for reasons inherent to biogenetics than because of external events, and these potential events could affect the depressive state of the person affected for good or bad. An example for this would be a certain type of depression which traditionally is observed in the early age stages of its victims and seems to be related with mental disorders inherent to the patient natural mind and not to be triggered necessarily by external means, but as we have well made clear in the previous section, these assumptions had been invalidated by modern psychiatric theory.

Although by not having the possibility to separate by different level of exogeneity between types of depression (we only know if individuals are suffering from any kind of depression but we do not know which). Economists have tried to address the problem of endogeneity through different econometric techniques based in the traditional idea of finding an adequate instrument. For this particular approach, instruments used for economists in the past have been: psychological or psychiatric problems of parents, mental illnesses in the past (this could be a good instrument in our approach), religiosity, perceived social support and physical activity (this could be another instrument or variable that we could use in our data base). The idea then, would be to realize an instrumental variables analysis, in which as we economists know, especially for a complex case as depression could be, **it becomes a complex art finding a suitable instrument, that could be a good predictor of mental health and that could also be excluded from the main labor market equation.**

Another alternative could be trying to separate the analysis for patients who have suffered from depression before entering a certain labor market (so as to establish that it is depression which is affecting that specific labor market and not otherwise) in order to be

able to assume with greater certainty that the specific depressive diagnose in question is indeed exogenous (statistically speaking).

Now, going back to previous literature, while there are substantial studies that have established a causality relation between mental health and labor market in the last decade, few of them have done this through an instrumental variables approach, in a way that they could conclude in satisfactory terms that the findings or effects identified are indeed exogenous or absent of noise caused by other variables (see Ettner et al., 1997 Hamilton et al., 1997 Marcotte et al., 2000 and Alexandre and French 2001). Regarding this matter, the paperwork done by Friejters, Johnson y Shields (2010) presents an approach with more accurate findings through a IV analysis, the authors managed to find an exogenous variation of mental health which affects only labor market outcomes through its impact on mental health. The findings made by these researchers suggest a lack of mental health could converge into poor outcomes related to the labor market, such as low levels of participation and salaries or high absenteeism.

Specifically, using as an instrument the death of a close one (strong determinant for mental health but not necessarily for physical), they make an effort to solve the persistent problems of causality and selectivity, finding that a worsening of mental health leads to statistically significant deterioration in the individual's labor participation, and that this effect is greater for women and older people. The magnitude of these labor costs mentioned before however varies substantially within pertinent literature, which in many cases finds somewhat little effects of mental health in labor participation (Cornwell et al., 2009) and in other cases finds large effects for some particular groups of individuals (Chatterji et al., 2007, Zhang et al., 2009).

There is also vast literature that suggests that mental illnesses are strongly correlated with a wide variety of bad outcomes, such as the so mentioned poor labor market outcomes, worsening of family life, becoming homeless or being either perpetrator or victim of a crime. To this respect, Bartel and Taubman (1979, 1986) are examples of research in some of these areas. These author use twin samples of the National Academy of Science – National Research Council (NAS – NRC) to analyze the impact of different illnesses in labor market activity, focusing in other mental disorders like psychosis or neurosis, nonetheless, they manage to deliver substantial evidence suggesting that diagnoses of mental disorders were linked to a large and significant reduction in income in relation with the healthy individuals (healthy understood as without mental disorder diagnosis).

Additionally, Frank and Gertler (1987) land this subject to its labor field, very similarly as we will try to do (to be fair, we got the inspiration from them). Their outcomes suggest that the presence of anguish or mental distress reduces income level around a 21-33%. They use a data set that contained distress measures based on diagnoses made by a single same source, which therefore could accuse presence of measurement-error bias. This measurement arises due to the fact that mentally-ill individuals who did not seek medical support appear as “mentally healthy” in the data. To measure this bias the authors use estimation models based on two different approaches, which deliver outcomes similar enough to argue that very little bias is introduced when using the measuring method proposed. In this paper we also identify the existence of censored observations in our data set, to which the recently quoted authors also propose a classical solution which is typically oriented to eliminate this bias, this means that apart from their lineal estimation they add a Tobit model to their framework.

Benham and Benham (1981), using a small sample of 244 men who were studied in two different moments in time over a period of 30 year, analyzed that impact of psychosis, sociopathy, alcoholism and neurosis in labor market incomes. They find that more chronic diseases (such as psychosis) should have more pronounced effects than the more fleeting ones (such as neurosis) on income worsening independently of initial severity.

Now, once the potential problem of inverse causality has been identified, we still must take care of the traditional bias introduced by unobserved individual heterogeneity. One way to solve this is through the use of longitudinal data (panel data), which relies on trying to eliminate non observables differences between individuals that remain constant overtime. Frijter, Johnson y Shields (2010) also tried to address this problem in some of their specifications (they formulate a total of 7 different models) and in theory we could do so as well, given that the EPS (our data base) is conducted in several waves which follow individuals within a period of around 30 years.

Therefore, now that we successfully made clear the advantages of our data, we next analyze how feasible it is to address either endogeneity problem or the unobserved individual heterogeneity (or both), and if we focus only in income as the dependent variable or in employment or participation as well. In this last case a more complex model could be formulated, such as a Duration model, which would be perfect for the situation but again, the approach to take would be carefully revealed by our data set, and that analysis is not pertinent for this section yet.

So, regarding then our two tentative dependent variables used to isolate the effect of the depression in labor market, income and employment, for the second one we would take as

reference the great worked realized by Frijter, Johnson y Shields (2010) and for the first one we would use as basis the work done by Frank y Gertler (1987) which is substantially shorter and more concise but that nonetheless gives us useful guides to address the problem of censured data and good methods to measure mental health in a feasible way.

#### **IV. Data**

To study the effect of Depression in the Chilean labor market we will use the “*Encuesta de Protección Social 2009*” (Social Protection survey 2009).

The EPS gathers information about the labor market and the current social protection system in Chilean society. Its data is provided by same individuals in different moments of time, so as to build a panel data way of storing information.

In 2002, the *Ministerio del Trabajo* (Labor minister) and the *Previsión Social de Chile* (Chilean Social Welfare), through *Microdatos* (Microdata) of Universidad de Chile department of economics, and with the technical support of Pennsylvania University, designed and conducted the first Social Protection Survey, which by that time was called *Labor History and social security*. This survey was applied to a sample of 17000 members of the Chilean welfare system of pensions. Since 2004 a sample of none members was added to the previous sample, constituting it therefore into a national representative sample. By the years 2006 and 2009, this same sample was reviewed, which is of approximately 20000 observations distributed along the whole country.

The SPS have allowed us to obtain information about labor market fundamental data and the pension preferences of Chilean society, and also socioeconomic, demographic, property, human capital, financial literacy and awareness of the social security system valid in the country.

The modules of the survey that we will mainly use are the ones related to Labor History and Health. The first one is used to find out information about labor activities performed by the surveyed ones in the past and the present and remuneration perceived by them for these

activities. In the second one, individuals are asked about their medical history and their use of coverage provided by the social public system. In this module we can find for example the question: *¿Have you ever been diagnosed with any of the following medical conditions by a doctor?*. In which one of the options disposed for answering would be *Depression*, which is the relevant one for our study. As it is mentioned before, Depression would be understood by us as the presence of a Major Depressive Disorder, which can be expressed through different pathologies and mood disorders.

Even though it could be seen as a limiting factor in the data the fact that the answer related to a person suffering or not suffering from depression came directly from the person in question, we believed this issue is of minor scale, due to the fact that the question is addressed directly to find out if a doctor has made the diagnose (and therefore not the person being asked), so by this conjecture we could expect to minimize the bias provoked by answers given based on an erroneous conception or low information of the individual being surveyed.

*A priori*, we would expect that Depression would have a negative impact in employment and income of the individual directly affected. First, we could anticipate that individuals suffering from this disease are mentally handicapped to participate in the labor market or are more exposed to live the experience of unemployment. Secondly, is very likely that, because of depression, the individual in question could experience a worsening in his or her productivity, which could be translated afterwards into a lower salary, in comparison with his or her healthier peers.

### *Descriptive Statistics*

In this sub section we try to present our chosen sample in numbers, in a effort (hopefully a successful one) to guarantee a minimum of representativity of our data in relation with Chilean reality, and also, to reveal some lights suggested by the data before our empirical approach were executed.

In this country, population is equally distributed between men and women (nearly a 51% of women and a 49% according to the last census). So by calculating the proportion of genders in our sample and the shares for people who suffers from depression, we could find potential traces of what was theoretically stated at the medical background, which is specifically if it is actually correct to say that women *may* be more likely to suffer from depression than men. The following tables summarize what we are suggesting:

**Table IV.1**

Total population distributed by gender			
	Freq.	Percent	Cum.
sex			
men	7,077	48.93	48.93
women	7,386	51.07	100
Total	14,463	100	

**Table IV.2**

	Have you ever been diagnosed with depression? (%)			Total
	yes	no	no answer	
sex				
men	19.66	51.91	54.29	48.93
female	80.34	48.09	45.71	51.07
Total	100	100	100	100

As you can see, our sample is equally distributed in a very similar way to the whole country in terms of gender. But when we disaggregate it by people who have suffered from depression, it is the soft gender which carries the flag by far. More than 80% of people who has ever been diagnosed from depression are females, which could be a symptom of women's tendency to fall into this medical pattern.

Another question we would like to address in our study is if the socioeconomic situation has something to do with the propensity to suffer from depression. One could argue that poor people is more likely to fall into depressive behaviors because their basic needs are unsolved, or maybe due to the fact that they have achieved lower levels of education, and therefore fewer weapons to defend themselves against adverse situations randomly presented in life.

So what we did was to tabulate the sample, separated by quintiles, in terms of average monthly income by quintile and average percentage of depressed people by quintile. Our results, shown on Table IV.3, drive us to the conclusion that it might exist a relation between being poor and being depressed, which can be inferred due to the fact that the lower the quintile the greater the average depressed people you can find inside the sub sample. Nonetheless, this relation is broken once you get to the richer quintile, which shows a greater propensity through fall into depression than the fourth one. Those percentages correspond to the average level of our dummy variable, which takes the value 1 when the individual was ever diagnosed with depression before. So as you can see, in our lower quintile in terms of income, average people who has ever been diagnosed with depression is of 14.11% of the sample, and this amount decreases when income increases (a negative correlation), except for the richer quintile, a fact that could possibly be related to

different reasons that are not being analyzed in the data this time. It is very important to note that income distribution in Chile is the worst between the OECD countries, which could naturally intensify the correlation between income and depression.

**Table IV.3**

quintiles	monthly income	% of depressed people
1	47063.91	14.11%
2	146839.3	9.60%
3	191147.8	7.29%
4	283403.4	4.25%
5	723075.6	6.85%
Mean	273837.3	8.44%

We are also interested in finding out if depression has something to do with marital status. So, to this regard, we could argue that married people, given that they enjoy the company of their families (wives and sons), are less likely to suffer from depression than people who are single, separated or widow(er). Table IV.4 then shows the distribution of depressed people within not married people and then within married people.

**Table IV.4**

Have you ever been diagnosed with depression? (%) by marital status			
	not married	married	Total
no	89.57	91.83	90.7
yes	10.43	8.17	9.27
Total	100.00	100.00	100

As you can see, within not married people, a 10.43% of them have been diagnosed with depression in the past, but for married people, these proportion is slightly lower (8.17%). Nonetheless it seems a statistical difference that is probably irrelevant or not significant, which could be proved with a t test of significant difference. These results suggest that depression does not take into account marital status of people affected by it.

The same analysis could be extrapolated to differences in depression patterns between levels of education, so as to be able to conclude if having achieved superior education would give individuals useful tools to overcome potentially depressing periods.

Table IV.5 summarizes depression distribution within individuals with tertiary education and the rest of them.

**Table IV.5**

<b>Have you ever been diagnosed with depression? (%) by profession</b>		
	no profession	profession
no	90.72	91.61
yes	9.28	8.39
Total	100	100

**Table IV.6**

<b>Individual has completed at least one career</b>		
	Freq.	Percent
no	14,308	98.93
yes	155	1.07
Total	14,463	100

These numbers suggest that within professional individuals an 8.39% have been diagnosed from depression in the past, which is not much different from the 9.28% recorded for people without profession.

An additional issue would be that, given that professional people is only a 1.07% of the total sample (as shown on Table IV.6), results could not fully represent two comparable universes of people. For example, it could be that the so few individuals who are actually professional have all had a very hard time in their lives due to causes that are not related to their profession or not well captured by the data, but their education gave them tools to overcome their personal problems. So by looking only the average levels shown by data we could incorrectly assume that there is are no observable signs of correlation between education and depression. This issue of course would be addressed in this paperwork later (when we apply our methodology).

Another interesting analysis would be to find out if depression has something to do with age, so as to be able to disentangle if some age groups are more likely to suffer from depression. We took a similar approach that in the case of income, in the sense that we constructed ten age groups (deciles) and calculated the mean percent of depressed people within each age group. The results are shown in Table IV.7.

**Table IV.7**

<b>age decile</b>	<b>aver.age</b>	<b>% of depressed people</b>
1	27.8	5.33%
2	34.1	6.98%
3	38.5	8.72%
4	42.5	8.74%
5	46.5	9.46%
6	50.5	10.14%
7	54.9	11.28%
8	60.3	12.57%
9	67.7	10.34%
10	79.4	9.71%
Mean	50.22	9.27%

These results suggest that, as people gets old, their likelihood to suffer from depression increases until their starting sixties, and after that, it decreases a little. These results are coherent with some theories that postulate that elders get more depressed because as people get older they also get lonelier, however, our two higher deciles suggest otherwise, showing that there is a reversion in this tendency once individuals get to their sixties.

A final question to which we would like to reveal some useful descriptive lights would be to find out if there is a correlation between being unemployed and being depressed. Table IV.8 shows the distribution of depressed people separated by employment situation.

**Table IV.8**

Have you ever been diagnosed with depression? (%) by employment			
	employed	unemployed	Total
no	91.14	87.38	90.73
yes	8.86	12.62	9.27
Total	100	100	100

This numbers suggest a low prevalence of depressed people within the ones that are unemployed versus the ones employed, which can be inferred from the fact that 12.62% of our sample of unemployed people have ever been diagnosed from depression, against a lower 8,86% for people who has a job.

So to conclude with this section, we summarize our descriptive suggestions by stating that statistics seem to suggest that: **First**, depression appears to affect substantially more women than men. **Second**, depression seems to be less present as we go up in our income distribution, with exception of the last quintile, which shows a gentle upgrade in the proportion of depressed people in comparison to the previous one. **Third**, not married individuals are slightly more depressed in proportion than married ones, but this difference is not necessary statistically relevant. **Fourth**, professional people are also very similarly distributed in terms of depression in relation to none professional individuals, with a slight less probability of suffering from depression if individuals have completed superior education. Nonetheless this inference could be very well invalidated by the fact that so few people in our sample has been lucky (or capable) enough to complete a tertiary education program, and also, by the very low magnitude in the difference of depression distribution in comparison to none professional individuals. **Fifth**, depression within age distribution

suggests that, consistent with aging and depression theories, as individuals get older, they also get more depressed (in frequency), but this pattern is broken after once they get to their sixties. **Sixth**, Unemployed people seems to be more prone than employed individuals to suffer from depression, which is also consistent with the hypothesis we try to prove (or reject) empirically latter.

Regarding the construction of the variables and the assumptions taken into account to design them, a much exhaustive explanation would be delivered in the next section. So, if methodology doubts came out the surface, we hope to address them properly in the next section.

## V. Methodology and Results

This section is aimed to disentangle the way in which we proceeded with our study. What we did first was to figure out which would be some of the most important determinant factors of our disease in question, so as to be able to control for relevant sources of variation when we ran our models.

Specifically what we did first was to regress our dummy variable that takes the value 1 if that certain individual was ever diagnosed with depression, against our chosen independent variables which we concluded, after our revision of substantial and pertinent literature, that were relevant for explaining depression. These variables were age (edad), age<sup>2</sup> (edad2), dummy for marital status (Dcasado), dummy for being professional (Dcarrera), dummy for gender (Dsexo) and a variable that indicates frequency of physical activity practice (deporte), where 7 is none at all and 1 is 5 or 6 times a week.

This model we first ran was naturally a probit and our results, which are shown in the appendix (Model VI.A), basically point out to the fact that all of these variables were significant in explaining depression, excepting the dummy for being professional and our sport variable. So after these findings we immediately perceived some lights about the fact that maybe our sport variable was not such a good instrument at all for addressing the problem of endogeneity, due to the lack of relevance in explaining depression, for which we also found a very weak correlation with our depression variable (of about 0.02).

Another important light filtrated through this exercise was the fact that, according to the dummy for gender obtained coefficient, women are around a 70% more likely to be affected by depression than men. This last inference is perfectly consistent with our revised

medical literature, which suggested that women were somewhere between 2-3 times more prone than men to suffer from depression.

The approach we took to identify the effects of suffering from depression in the labor markets was basically concentrated in two main different outcomes, and therefore, two different approaches.

**The first one** was an attempt to disentangle the effect of having ever suffered from depression, in **income**. For this approach, we basically constructed the classic natural logarithm of the salary per hour ( $\ln(\text{ingreso\_hora})$ ), which was built up simply by dividing our variable of monthly income in 22 working days (average number of monthly working days), multiplying it by 5 (to get the weekly income) and then dividing it by the amount of hours worked each week on average, so as to finally apply a logarithm transformation to it.

It is important to notice that in the EPS it is possible for individuals to report more than 1 labor history, so what we did was to collapse all of these stories in 1, assuming that the monthly income would be an average of all those periods in which the individual was employed.

We then regressed, using a simple OLS approach, our income variable against our indicator of depression, which was a dummy that takes the value 1 if the individual in question was ever diagnosed with depression ( $D_{\text{diagnosdep}}$ ), the variables age ( $\text{edad}$ ),  $\text{edad}^2$  ( $\text{edad}^2$ ), dummy for gender ( $D_{\text{sexo}}$ , a 1 is assigned for men), dummy for marital status (1 if married and 0 for each other case), dummy for having completed a professional career and finally vectors of control dummies for geographic region of work, occupation or job by trade, and activity of the employer company.

The problems we had with our estimation was that we had to remove all our vectors of control dummies because by including them, all of our other variables of interest lost great levels of significance, given that STATA suggested that there were important issues of multicollinearity present in them (that were also evidenced when we calculated a VIF index) due to the poor quality of the data collected in this subjects. This could therefore be translated into a great deal of redundant categories (there were around 300 different categories for jobs and around 150 different categories for company activities). So to this regard, we had to sacrifice higher levels of R squared so as to be able to get significant findings in relation to our more important variables of interest (mainly depression).

Our findings were all consistent with their expected directions. We found that having ever been diagnosed with depression is translated into an 18.1% lower salary but only with a 90% of significance. Salary increases by a 4.9% for each additional year of age, but as people gets older the increase is every time lower, which is consistent with all labor or Mincer models that suggest that age increases an individual's salary but with a decreasing rate. Our dummy for gender is of the expected sign but surprisingly of not enough significance to be able to conclude statistical differences between men and women. Being married increases the individual's hour income by 11.5% at a 90% of significance. Finally, being professional increases the individual's salary by almost 58%, as one could reasonably expect. Our results are shown on Model 2 in the appendix.

**Our second** approach was focused on identifying the effect of depression, measuring it just like in our previous model, in the likelihood of being depressed. This model was specified with the same variables than before in the explanatory side. But our dependent variable was a binary one that took the value 1 if the specific individual was prone to be unemployed.

Given that in our data many individuals presented more than one labor history we had to collapse all of these records into one single variable for unemployment, which was naturally the average of this value for each individual in their different reported stories, and therefore oscillated between the values 0 to 1. So what we did, in order to transform this average into a binary variable, was to assume that all individuals with a value of 0.5 or more should be treated as unemployed, and all individuals with a value of less than 0.5 should be treated as employed. The intuition behind this strong assumption is that if a single individual was unemployed at least at half of his or her reported stories then it was clear that this person was more likely or had more tendency through being unemployed.

Specifically we ran a probit and a logit model, both including the same variables, and came up with the same issues than before, so our dummy control variables were removed due to collinearity. Our results can be found on the model 3 and 4, presented in the appendix section.

Our findings were all of in the expected direction (sign), but our coefficient associated to the impact of being depressed in the likelihood of being unemployed was far lower than expected in magnitude (although it was statistically significant). Specifically we found that having been diagnosed with depression in the past increases the likelihood of being unemployed in around 1.8%. Each year of age decreases the likelihood of being unemployed in 2.4 – 5.3%, which is a finding of substantial magnitude, but as people gets older this effect is every time more innocuous. Nonetheless this decreasing rhythm is too little in magnitude. Our dummy for gender suggests that men are about a 2.4% less prone to being unemployed. Being married reduces likelihood of having no job in a small 1.5%. A

similar magnitude was found for having a profession but with the exception that in this last case, we found no statistic significance.

We also mentioned before that it would have been interesting to address the problem of endogeneity between both of our labor market stochastic variables and our depression signpost, by instrumenting this last variable with a useful tool which in previous literature prove to be frequently a good one. This independent variable was the practice of physical activity or sports. So to this regard, we tried to ran a VI model similar to those we ran before but using our variable called “deporte” (sport) as an instrument (which was an indicator of physical activity frequency), just like the ones we identified that were use in previous health economics research.

Nonetheless, after we obtained the results of our first model we realized there could be some important issues with the validity of our instrument (in addition to the fact that the correlation between our sport variable and depression was very weak), and therefore, when we looked at the numbers delivered by our VI delivered regresors, we concluded immediately that our instrument got short of statistical significance. Short enough to be dismissed as an instrumental option.

So given that we were not able to address properly the potential presence of endogeneity in our model, one could wonder: Why wouldn't we try to attack the other relevant issue we have reiterated some times in previous sections? The issue of unobserved heterogeneity, which could be addressed through a panel data approach. The answer to this question is quite simple: Even if we had different waves of data for different moments of time and for the same individuals, the comparisons for these individuals and their evolution in time

would not have been possible with a minimum grade of guaranteed precision due to the fact that the expansion factors needed to ensure the quality of such a procedure were not constructed or at least available for public research by the time we wrote this empirical essay. So there is clearly much work of longitudinal data analysis that could be done with this same data, at least once the expansion factors were available for general population.

To sum up our empirical approach, we separated it in two parts. The first one consisted in a traditional OLS model which aimed to identify the effect of depression in the individual's income from labor and we found that individuals who were ever diagnosed with depression perceived an 18% lower salary than those who had not. Our second approach was a model that used the same variables than the first one in the explanatory side, but our dependent variable was a binary one that took the 1 value if individuals were prone to be unemployed (concluded by their reported labor stories). This model suggested that individuals who were ever diagnosed with depression were around a 1.8% more likely to be unemployed than those who had not. The rest of our explicative variables coefficients had the expected sign.

One empirical robustness impediment one could identify in our models is that, as we mentioned before, all of our vectors of dummy variables for control were loaded with substantial collinearity powder, possibly due to redundancy of many categories of type of job and activity of the company (bad data gathering). To this last regard, we had to remove all this variables, which gave statistic significance to our relevant variables (mainly depression) but, as a counter attack, undermined great deals of goodness of fit, represented by a lower R squared than we would have wished for.

These findings suggest then that depression, as a disease, even if an individual suffered it just in the past, has indeed adverse effects in the labor market, which are of great importance and amount in the case of labor income (of around a 18% decrease) and of minor relevance but still statistically significant for unemployment (increases probability of being unemployed in around 2%).

This of course, is without ignoring all the improving possibilities that could be suggested and applied to our model, with all of its flaws and virtues presented here. Which, as it is presented right here, we suggest it should be analyzed as a simple parsimonious model that can prove to be very valuable as an input or example for further research in the field of Health and Labor Economics.

## **VI. Concluding Remarks**

With this working paper, we have tried to take our best shot to make a rich contribution to the nowadays pueril field of Health Economics in Chilean academy, by suggesting a practical approach in order to identify the mechanisms and magnitudes in which depression, as a limiting health condition, can prove to be very detrimental for individual's welfare. This last idea is proxied, at least partially, through simple labor market outcomes such as income and employment.

Our results point out to what medical and labor theory would have predicted in general terms. We found that having ever been diagnosed with depression represents an 18% reduction in income and raises likelihood of being unemployed in a slight 1.8%. This last result was lower in magnitude than what one could have expected, but nonetheless our depression variable prove to be significant (although at different levels) in both of our empirical approaches.

These results are not only important in the sense that they prove (or at least suggest) that there is a direct link through which depression may deteriorate a certain individual's economic welfare. But it also shed lights for policy makers to start focusing their efforts in treating this costly disease or at least to upgrade its rank some levels in their medical priority agenda, especially when it comes to women, who appear to be a 70% more prone than men to suffer from this disease.

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### Model VI.1 (OLS income)

Linear regression

Number of obs = 9631  
 F( 6, 9624) = 12.92  
 Prob > F = 0.0000  
 R-squared = 0.0110  
 Root MSE = 2.7885

lningreso~a	Coef.	Robust Std. Err.	t	P> t	[95% Conf. Interval]	
Ddiagnosdep	-.1810066	.1100614	-1.64	0.100	-.3967502	.034737
edad	.0485599	.0188322	2.58	0.010	.0116448	.0854751
edad2	-.0007374	.0002066	-3.57	0.000	-.0011424	-.0003323
Dsexo	.085601	.0595159	1.44	0.150	-.0310628	.2022647
Dcasado	.1155712	.0599977	1.93	0.054	-.002037	.2331794
Dcarrera	.5795534	.2512926	2.31	0.021	.0869669	1.07214
_cons	5.542121	.4077788	13.59	0.000	4.742789	6.341454

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### Model VI.2A (probit unemployment)

```

Probit regression                               Number of obs   =    14463
                                                LR chi2(6)      =    226.02
                                                Prob > chi2     =    0.0000
Log likelihood = -4917.5755                    Pseudo R2      =    0.0225
    
```

dummyscesan~B	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
didiagnosdep	.1033562	.0251937	4.10	0.000	.0539776	.1527349
edad	.0240316	.0063481	3.79	0.000	.0115896	.0364735
edad2	-.0003475	.0000616	-5.64	0.000	-.0004683	-.0002268
Dsexo	-.1289084	.0283527	-4.55	0.000	-.1844787	-.0733381
Dcasado	-.0790561	.0289752	-2.73	0.006	-.1358464	-.0222659
Dcarrera	-.0928839	.1338579	-0.69	0.488	-.3552405	.1694728
_cons	-1.415447	.1535797	-9.22	0.000	-1.716458	-1.114436

end of do-file

. mfx

```

Marginal effects after probit
y = Pr(dummyscesanteB) (predict)
= .10472176
    
```

variable	dy/dx	Std. Err.	z	P> z	[ 95% C.I. ]		x
Ddiagn~p	.0187578	.00457	4.10	0.000	.009799	.027717	.111872
edad	.0043614	.00115	3.81	0.000	.002115	.006608	49.896
edad2	-.0000631	.00001	-5.70	0.000	-.000085	-.000041	2721.41
Dsexo*	-.0233641	.00513	-4.56	0.000	-.033415	-.013314	.489318
Dcasado*	-.0143674	.00527	-2.73	0.006	-.024697	-.004038	.512342
Dcarrera*	-.0159101	.02159	-0.74	0.461	-.058218	.026397	.010717

(\*) dy/dx is for discrete change of dummy variable from 0 to 1

### Model VI.2B (logit unemployment)

```

Logistic regression                Number of obs   =    14463
                                  LR chi2(6)         =    229.23
                                  Prob > chi2        =    0.0000
Log likelihood = -4915.9723       Pseudo R2      =    0.0228

```

dummyscesantEB	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
didiagnosdep	.1852735	.0430949	4.30	0.000	.100809	.2697381
edad	.0535027	.0127819	4.19	0.000	.0284506	.0785549
edad2	-.0007501	.0001268	-5.91	0.000	-.0009987	-.0005015
Dsexo	-.259384	.0542878	-4.78	0.000	-.3657862	-.1529818
Dcasado	-.1579614	.0553208	-2.86	0.004	-.2663881	-.0495346
Dcarrera	-.1704766	.2541692	-0.67	0.502	-.668639	.3276858
_cons	-2.601923	.3035824	-8.57	0.000	-3.196934	-2.006913

```

*
end of do-file

```

```

. mfx

```

```

Marginal effects after logit
  y = Pr(dummyscesantEB) (predict)
  = .10315611

```

variable	dy/dx	Std. Err.	z	P> z	[ 95% C.I. ]		x
Ddiagn~p	.0171406	.00398	4.30	0.000	.009334	.024947	.111872
edad	.0049498	.00117	4.24	0.000	.002661	.007238	49.896
edad2	-.0000694	.00001	-6.05	0.000	-.000092	-.000047	2721.41
Dsexo*	-.0239741	.005	-4.80	0.000	-.033769	-.01418	.489318
Dcasado*	-.0146432	.00513	-2.85	0.004	-.024699	-.004587	.512342
Dcarrera*	-.0147606	.02055	-0.72	0.473	-.055036	.025515	.010717

(\*) dy/dx is for discrete change of dummy variable from 0 to 1