Minor Field Study

The Impact of Remittances on Labor Supply: The Case of Jordan

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Abstract

One aspect of how migration can affect countries' economies is through the labor income sent from the emigrant back to the source country. These are called remittances and constitute an important income post for Jordan, the country which is the subject of this study. This study aims to investigate how the received remittances are affecting the recipient households' labor supply by applying the neoclassical model of labor-leisure choice, and by analyzing data on household income and expenditure surveys from the Department of Statistics in Jordan. The multiple regressions show that remittances affect labor supply negatively for both men and women and these results thereby contribute to the understanding of how this aspect of migration affects the source country's economy.

Keywords: Neoclassical Model of Labor Leisure Choice, Labor Supply, Remittances, Jordan, Migration.

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1. Introduction

The growth of international migration has been accelerating at a steady pace in recent years and is a becoming an important and emphasized issue, especially for the developing countries (Eversole 2008, p 94, World Bank 2008). It is therefore interesting and of importance that we learn about the effects of migration. Flows of people between countries affect the economy of both the receiving and the source countries. Due to the differences in income per capita among countries with a large immigration or emigration, the movement of populations raises several questions about what effects migration has on countries' economies and the impact migration can have on development. Can migration lead to income convergence between source and host countries and foster economic development in the source countries (Gubert 2007, p 94-95)? One possible way in which migration could have these kinds of effects is by generating flows of remittances. Remittances are flows of capital defined as: "money earned or acquired by migrants that are transmitted back to their country of origin (United Nations Population Information Network)." According to Adams (2003, p 4-5) remittance is the most visible product of international migration and one of the best measure of the aspects of migration. Remittances represent one of the largest sources of financial flows to developing countries (Barajas et al 2009, p 3) and the flows have increased rapidly in recent years; from 2001 to 2007, worldwide remittances more than doubled to US$336 billion (IMF 2009, p 1). These numbers present just the flows through official channels. The sum is probably a lot larger considering the unofficial channels that can not easily be measured and registered, e.g. when they are sent through postal service and sent through borders by friends e.g. (Barajas et al 2009, p 3). The receipts from remittances even exceed receipts from the export of goods and services and from financial inflows of foreign direct investment for some countries (IMF 2009, p 1). For developing countries remittance surpasses official development assistance and is second to foreign direct investment (Jadotte 2009, p 2). More and more policymakers and economists emphasize the importance of remittances to development (Barajas 2009, p 4, IMF 2009, p 12) and therefore it is critical to see if this optimism is warranted.

There exists no widespread consensus of the effects of remittances on a country's economy. Some researchers argue that remittances as additional capital can reduce poverty and increase economic growth if invested (Russel 1986, p 686). Other studies have shown that this type of capital is not invested, but used for consumption of imported goods, and therefore is not good for the recipient country's economy (Barajas et al 2009, p 16-17). Central to the

understanding of the efficacy of remittances receipts as a catalyst to growth are the ways in which remittance receipts affect household decision-making (Airola 2008, p 70). One way remittances could affect household decision-making is by impact on recipient households' decision on how much labor it should supply, depending on if the receiving households see it as more profitable to supply more leisure after the extra type of income or not (Jadotte 2009, p 5). The effect of remittances on labor supply is therefore unpredictable, thus becoming an empirical question. This study will examine the effects of remittances on labor supply in Jordan. Jordan qualifies as the fourth country on a list of the world's most remittances dependent countries, measured as a percentage of the GDP (Chami et al 2008, p 13). Jordan has a high dependency on remittances and this is, according to some researchers, a challenge to the Jordanian economy (World Bank 2010, Russel 1986). It is therefore interesting to dig deeper into the effects of remittances and investigate if it is a benefit, or a burden, to the country.

But why should we care about how remittances may impact the labor supply of remittance-receiving households? Empirical findings on the outcomes of remittances on household behavior would add to our understanding of the costs and benefits of this aspect of migration. If labor supply decreases in recipient households, these families may continue to depend on remittances to meet their needs. This strong dependence is not expected to decline in the future (Acosta 2006, p 2-3). The objective of this thesis is to contribute to the understanding of the impacts of migration on the source country's economy, which will be done by studying how remittances are affecting labor market outcome. The research question that will steer this thesis is:

What are the impacts of remittances on the labor supply in Jordan?

By using the neoclassical model of labor-leisure choice, and the established assumption that leisure is a normal good, the hypothesis of this study is that the remittances lead to a decline in the remittance-receiving households. Even if several studies of remittances and migration in Jordan have been carried out by other researchers (see Kirwan 1981, El-Sakka 2007, Sondos and Kharmeh 2010), there has still not been any study of how remittances affect the country's labor supply. Some earlier studies, summarized in chapter 3, do however show that remittances will increase labor supply for certain countries. It is therefore interesting to examine if my results of the Jordanian labor supply will support the hypothesis or correspond to some of the earlier studies. To examine the consequences remittances have on labor supply

the approach is to utilize data on income and expenditure on households in Jordan. Initially, the characteristics and labor market outcomes of households that receive remittances will be compared to households that do not receive remittances. This will be shown in tables with descriptive statistics. I will also conduct regression analysis to get a clearer idea of how remittance can influence the working decision. The data used is collected by the Department of Statistics of Jordan (DOS). The household surveys are from 2002, 2006 and 2008 which can be said to be relatively close in time. The limitation of 2002-08 as the primary time period for my analysis can be motivated by the unstable pattern of the received remittances that existed earlier (see e.g. Chaterlard 2002).

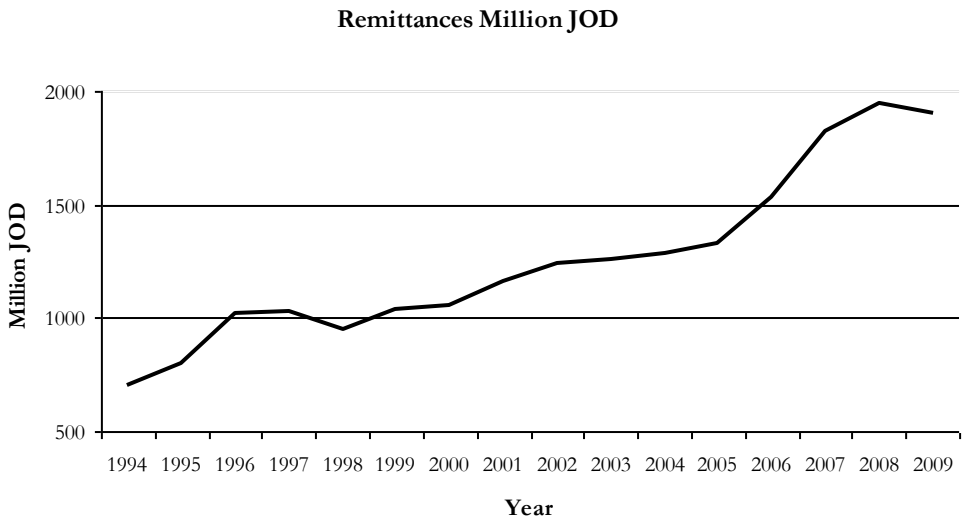
The disposition of the thesis is as follows: chapter 2 presents empirics on what the Jordanian migration pattern looks like and on the situation in Jordan considering the received remittances. Chapter 3 gives a short description of earlier research; both what has been studied in the field of remittances and labor supply, and what has been done considering the effects of migration in Jordan. A theoretical description is found in chapter 4. The method and data are presented in chapter 5 and the descriptive statistics are described in the following chapter. The regression analysis is presented and discussed in chapter 7, followed by a conclusion in chapter 8.

2. Background: Migration and Remittances in Jordan

Jordan is classified as a lower middle income country (World Bank 2011) and it has shown strong economic performance since 2000 with an annual GDP growth averaging 7.5 percent and per capita GDP more than doubling. Due to the economic slowdown in 2008, and the unstable situation in the region, Jordan is now meeting several challenges, including vulnerability to fluctuations in the international oil market, high unemployment and dependency on remittances from the Gulf States (World Bank 2011).

Migration from Jordan has been important for the economic development in the country as it has functioned as a labor exporter to the oil rich countries and a receiver of remittances in the form of labor income. In spite of its small population, Jordan is one of the key labor exporting countries in the Middle East. It is the third largest remittance receiving country in the Middle East following Egypt and Morocco (El-Sakka 2007, p 5). In 1984 remittances accounted for one-fourth of Jordan's GDP. In the end of 1980 the return migration from the Gulf started and accelerated during the Gulf War. This return of migrants increased the population of Jordan by ten percent and the fall in remittances accounted for ten percent of GDP. In the mid-1990s the stability of the region increased and again, the Jordanian skilled labor started to migrate to the Gulf States. As we can see in figure 2.1, the flow of remittances to Jordan has increased the last 15 years and a plausible explanation for that could be a decrease in the transfer cost for sending money back home, due to technological improvements and more competition among financial institutions (Acosta 2006, p 11).

Figure 2.1. Received remittances in Jordan in million JOD (Jordanian Dinars).



Source: Author's calculation from The Central Bank of Jordan (2010).

According to some estimates, if one takes the unofficial remittances into account, the actual remittances should be about 60 percent higher (El-Sakka 2007, p 5). Remittances per-capita in Jordan is also the highest among labor exporters in the Middle East (ibid. p 5).

Jordanian labor remittances are among the most important economic variables that contribute to the growth of the national economy. It represents an important economic resource in the Jordanian balance of payments, because of the high ratio of the total value of receipts that reached 25 percent of the current balance of payments. The remittances contributed to more than 40 percent of the balance of services, and more than 20 percent to GDP in the beginning of the 21st century (Central Bank of Jordan, 2010). The Jordanian Central Bank's reports indicated that the average of remittances received has increased from 420 million Jordanian Dinars (JOD) during the second half of the 70s to more than 680 million JOD during the 80s and more than 800 million JOD during the 90s and to 1,225 million JOD during the period 2000 - 2006. 250,000 Jordanians are working abroad and the majority of them have relatively high educational qualifications like a university degree. A large part of the senders are working in the Arabian Gulf States (Sondos and Kharmeh 2010, p 122). Recent years have seen an improvement in relations between Jordan and the Arab Gulf States, which has led to an increased demand for Jordanian labor, thus increased remittances.

As we can see from this background, remittances play an important role for the Jordanian economy. Before we can start estimating what the impacts on labor supply look like, a

summary of previous studies in this field, and what has been written about Jordan and migration specifically, is relevant.

3. Earlier Research

Previous literature on remittances has to a large extent focused on the motives as determinants of remittances and on the effects of remittances on poverty, inequality and economic development (Docquier and Rapoport 2005, Russel 1986). Other studies have investigated the impacts of saving in Pakistan (Burney 1987), or on consumption, investment and imports (El-Sakka 2007, p 8). Some empirical evidence shows that remittances can increase economic growth by functioning as a multiplier in gross national output. It also shows that high proportions of employment can be supported by remittances (OECD 2006, p 155). Jadotte (2009, p 2) mentions a study by Lamaute-Brisson (2002) that shows that if remittances are targeted to financing economic activities, they are likely to be distributed to informal activities in the service sector with low productivity. Lamaute-Brisson (2003) has also done a study about remittances in Haiti where she finds that even though remittances allow some households to get away from poverty, they do not necessarily reduce inequality as these transfers often are provided to the wealthier households. Acosta (2006) shows that remittances decrease the liquidity restraints in El Salvador and therefore increase both consumption and investments. But after controlling for household wealth and using selection correction techniques, remittances are negatively correlated to child labor and adult female labor supply. Average male labor participation is unaffected and an increase in girls' education level is increasing with remittances. Rodriguez and Tiongson (2001) find that the migrant and non-migrant labor participation is not separable and that remittance has a negative impact on labor supply but remittances are affecting men's, rather than women's supply of labor. Kim 2006, Bussolo and Medvedev (2008) have shown that remittances reduce the labor supply of mainly female, but sometimes also male workers. A study of the effect of remittances on the Mexican household labor supply has been conducted by Airola (2008), who finds that remittance is affecting the hours of work negatively, particularly for women.

There are researchers who present different results. Funkhouser (1992) observes that, in Nicaragua, remittances improve the entrepreneurial activities for men (even if reducing labor supply for women). The result that Kim (2007, p 12-14) finds from a simple cross sectional study is that remittance is negatively affecting labor market participation at the individual level. The weekly hours worked by employed people, however, are not affected. The panel data at the cluster level shows a negative impact of remittances on the labor force mainly because people receiving remittances have higher reservation wages., A survey by Cox-

Edwards and Rodríguez-Oreggia (2008) on households in Mexico finds no differences in labor participation between receiving and non-receiving households. For women in the urban areas remittances increase labor participation, and the possible explanation is that remittance contributes to the establishment of family owned enterprises which could improve the labor market opportunities for women.

Earlier research of remittances in Jordan shows that they are positively related to economic growth (Chatelard 2010). Another study investigates how the macroeconomic policy in Jordan affects the inflows of remittances (El-Sakka 2007). Other research regarding the impacts of migration and the inflows of remittances on the Jordanian economy during the 70s is done by Kirwan (1981) and he finds that the unemployment rate decreased because of the emigration and through the increase of domestic demand for labor. He also finds that a period of rapid growth was partly due to the high level of remittances. A study conducted by Ilahi and Shendy shows that there exist spillover effects from the oil-rich countries to the regional countries (among these Jordan). In other words, the growth in GDP in the Gulf States is correlated with the neighboring countries which supply the additional labor's received remittances (Ilahi and Shendy 2008, p 5, 13). According to a study conducted by Sondos and Kharmeh (2010) the impact of Jordanian workers' remittances on macroeconomic variables was significant. The household's final consumption expenditure increased by 33.6 percent per year, the government final consumption increased by 35.1 percent yearly, the total exports decreased by 39.5 percent per year and the gross capital formation increased by 31.4 percent, all due to remittances. Remittances contributed to increase in GDP by 7.1 percent. The impact of the high rate of Jordanian workers' remittances on the households' final consumption expenditure was due to a high ratio of marginal propensity to consume in Jordan, which is estimated to be more than 90 percent (Sondos and Kharmeh 2010).

After reviewing the different results from other researchers, it seems hard to predict how remittance is affecting the labor supply of a country. To my knowledge, there has not been any previous study on remittances' effects on household labor supply. This means that this study fills the void in this research field for Jordan. However, before I can start presenting my results for Jordan, there is a need to see on what grounds I can build my method to examine the issue. Therefore, a presentation of the theory used in this study follows in the next chapter.

4. Theory

The relationship between migration and economic growth is quite complex. Barajas et al (2009) describe remittances' effects on economic growth through different channels that can be said to belong to a "growth accounting framework", which means that the effects operate through capital accumulation, total factor productivity (TFP) and labor force growth (ibid p 5). Remittances can affect the capital accumulation in the receiving country in different ways. First, it can ease the poor households' constraints which can lead to an accumulation of their physical and human capital. Second, it may increase the creditworthiness of domestic investors, which potentially can lower the cost of capital in the domestic country. The lower cost of capital makes it then easier to borrow for more investments. A third way through which it can affect domestic capital accumulation is the effect on the macroeconomic stability. Inflows of remittances can make the domestic economy less volatile and therefore reduce the risk premium the firms demand to make investments, and thus it makes domestic investments more attractive. However, there exist potentially negative effects of remittances on growth. Remittances may be received by households which already have a large propensity to consume and are therefore possibly directed to more consumption rather than additional investments (ibid, p 5-6). The extra flow of foreign exchange from remittances can, without affecting the inflation rate, lead to the national currency appreciating, which may diminish the competitiveness of tradable goods and hence cause a deficit in the external current account, e.g. Dutch Disease (see Bourdet and Falck 2006).

The way remittances can affect growth through TFP growth is by influencing the efficiency of domestic investment, as well by affecting the size of the domestic production that generates dynamic production externalities (Barajas et al 2009, p 7-9).

Remittances can also affect economic growth through labor force participation. By stimulating productive investments that can create jobs. But there exists a moral hazard problem connected to remittances. When receiving an extra income the recipients' wealth increases, which can undermine their incentives to work, which in turn, would slow down economic growth (Naiditch and Vranceanu 2009, p 61, Barajas et al 2009, p 6-7). It is this negative aspect of remittances that I will look more closely into by using the neoclassical model of labor-leisure choice.

4.1 The neoclassical model of labor-leisure choice[1]

When analyzing the labor supply behavior, economists typically use the neoclassical framework which is called the *neoclassical model of labor-leisure choice*. By isolating the factors that shows what decides and impacts whether the individual chooses to work or not, and if so, how many hours she chooses to work, this model can help us predict how changes in economic conditions can influence the individual's work incentives (Borjas 2008, p 27). What is particularly interesting with this model is that it shows what can happen if the non-labor income increases. Remittances are a type of non labor income for the receiving households in the source country.

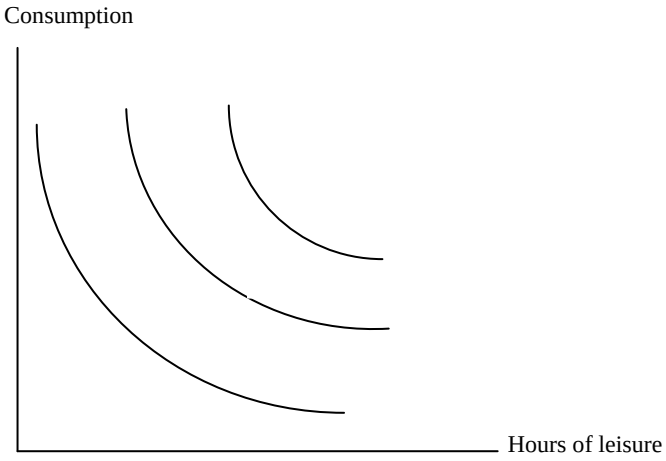
To understand the model one needs to start by introducing the term utility. The model presupposes that an individual gains utility (U) from consumption (C) and leisure (L), summarized by the utility function:

$$U = f(C, L) \qquad (1)$$

The higher level of utility U, the more satisfied the person. The model makes the assumption that the person's utility increases from both more consumption (the more goods she can buy), and more hours of leisure. Another assumption is that different combinations of consumption goods and hours of leisure might yield the same level of utility. A person can for example be indifferent to consuming a certain level of goods and leisure or consuming another level of goods and leisure (Borjas 2008, p 27-31). The many combinations of C and L, and the way a particular worker views the trade-off between leisure and consumption, can be illustrated by indifference curves as in figure 4.1.

[1] Information about this theoretical framework is taken from Borjas (2008, p 21-39) and from Björklund et al (2006, p 22-34).

Figure 4.1 Indifference Curves[2]



Different workers will probably view this trade-off differently. In other words, some may like to devote a great deal of time and effort to their jobs, whereas others would prefer to devote most of their time to leisure. Therefore, the indifference curves may look quite different for different workers. Interpersonal differences in the "tastes for work" are important determinants of differences in labor supply in the population but the interpersonal differences are very hard to observe for economists. Therefore, other variables that are much easier to observe, such as wages and income that may affect the labor supply, are instead stressed in economic models. Also, since these variables can be observed and measured, the predictions made by the model about which types of workers who will tend to work more are testable and refutable (Borjas 2008, p 29-30).

There is a limit to how much a person can consume goods and leisure, namely by her income and by her time. Some part of her income is not affected by how many hours she works. This part of her income can be property income, dividends, inheritance and lottery prizes and is called "nonlabor" income, denoted by *V*. The number of hours that the person will allocate to the labor market is denoted by *h*, and *w* is the hourly wage rate. These variables can form an equation called a person's *budget constraint*:

$$C = wh + V \qquad (2)$$

The equation shows that value of expenditures on goods (C) must equal the sum of labor earnings (wh) and nonlabor income (V). This model also implies that the person does not save. The worker spends all of her income in the period under analysis. To simplify the model

[2] The figures in this chapter are all made by the author.

we assume that the wage rate is constant for a particular person so the person receives the same hourly wage regardless of how many hours she works. There are two alternatives for the worker on how to use her time: work or leisure. The total time allocated to each of these activities must equal the total time available in the period with *T* hours per week, so that T = h + L. The budget constraint can then be rewritten:

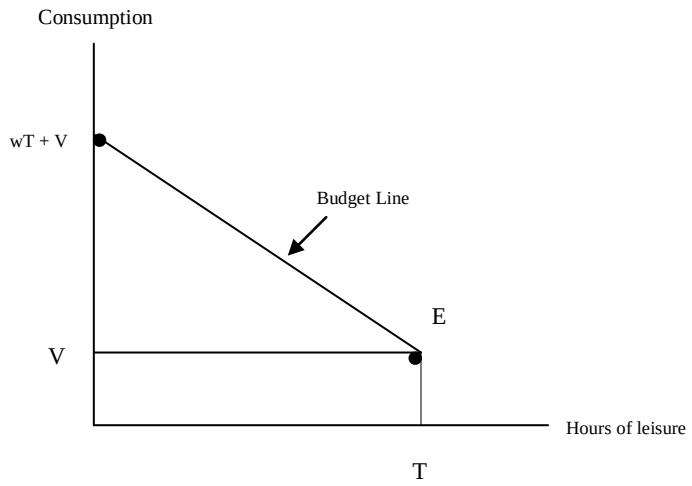
$$C = w(T - L) + V \quad (3)$$

or

$$C = (wT + V) - wL \quad (4)$$

Equation (4) is in the form of a line with a slope negative with the wage rate. This line is called the *budget line* and is illustrated in figure 4.2.

Figure 4.2 Budget Line

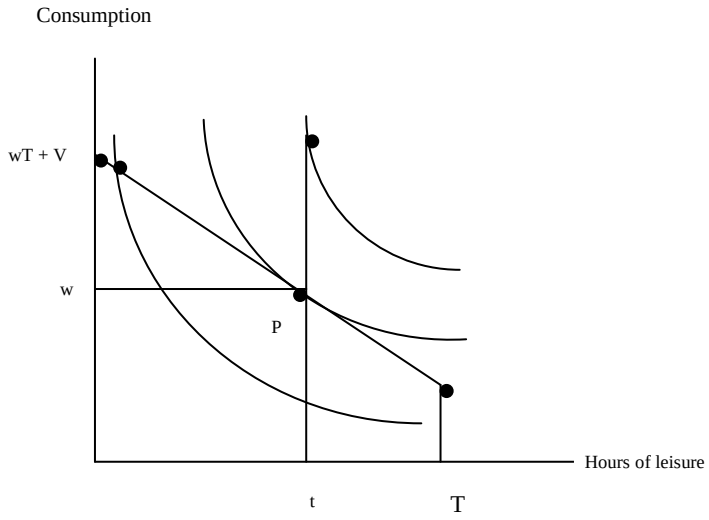


Point *E*, the endowment point, is where the person decides not to work at all and devotes *T* hours to leisure. At this point she can still purchase a value of *V* of consumption goods. Each hour of leisure consumed has a price and the price is given by the wage rate. At the intercept of the budget line the person can buy a value of (wT + V) of goods and this means she gives up all her leisure activities. The budget line shows the worker's opportunity set, the set of all consumption baskets that a particular worker can afford to buy (Borjas 2008, p 31-33, Björklund et al 2006, p 25-26).

This model makes another crucial assumption: the worker wants a certain combination of goods and leisure that maximizes her utility. Given the limitation of the budget constraint the

person will therefore choose a level of goods and leisure that gives the possibly highest utility level *U:* the highest possible indifference curve. Figure 4.3 shows a solution to this problem.

Figure 4.3 A Solution to the Labor-Leisure Decision

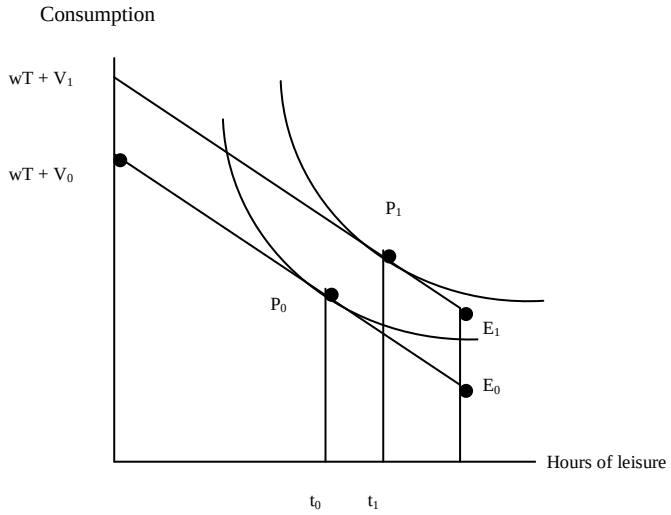


The optimal consumption bundle for the utility-maximizing worker is in this case at point *P*, where the budget line is tangent to the highest possible indifference curve. At point *P*, the worker will consume *t* hours of leisure and *w* worth of goods (Björklund et al 2006, p 26-27).

Using this model one can see what happens to the consumption of goods and hours of leisure if the wage or the non-labor income changes. As mentioned above, interesting to us is how changes in non-labor income (V) will affect how much the worker chooses to consume hours of leisure since *V* represent remittances.

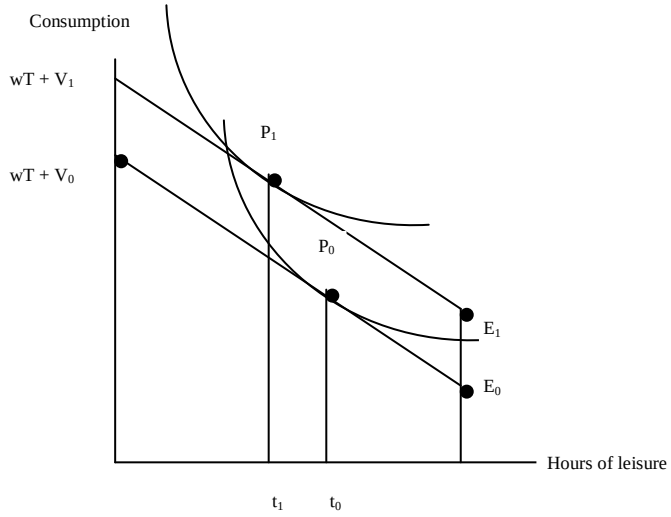
The value of expenditures on goods (C) must equal the sum of labor earnings (wh) and non-labor income (V). The choice of how many hours a person will work is when the value of expenditures equals the utility: U = C + L. If the remittances increase, this means that V increases. If the consumption is higher the utility will also be higher. But what will happen to the hours of leisure? There can be two possible effects: the hours of leisure can increase or decrease depending on what the utility function looks like, and this depends on whether leisure is a normal or an inferior good. When V increases, the worker can jump to a higher indifference curve such as point P_1 in Figure 4.4.

Figure 4.4. The effect of a Change in Nonlabor Income on Hours of Work. Leisure as a Normal Good.



Increased non-labor income then makes the worker better off. In Figure 4.4 we can see that at point P_1, the worker increases consumption and decreases working hours. Here leisure is a normal good which means that an increase in income will lead to an increase of the consumption of the good. In Figure 4.5, another scenario is illustrated.

Figure 4.5 The Effect of a Change in Nonlabor Income on Hours of Work. Leisure as an Inferior Good.



A rise in non-labor income would still increase the consumption of goods but decrease the hours of leisure since it is now an inferior good. An inferior good is when an increase in income will decrease its consumption. The impact of the change in non-labor income (holding wages constant) on the number of hours worked is called the *income effect.* The other effect,

called the *substitution effect*, could be illustrated as follows: as the wage rises, a worker faces a larger opportunity set and the income effect increases her demand for leisure and decreases labor supply. As the wage rises, however, leisure becomes more expensive and the substitution effect generates incentives for that worker to switch away from the consumption of leisure and instead consume more goods. This shift frees up leisure hours and thus increases hours of work. In this model however, we assume that the wage is held constant and therefore the substitution effect will be zero (Borjas 2008, p 35-39, Björklund et al 2006, p 31-34).

If one starts to ponder whether leisure is a normal or an inferior good, must of us surely value it as a normal good. If you were wealthier, you would probably demand more leisure. If the migrants' remittances function as a major source of non-labor income for the recipients, an income effect is expected with reduced labor supply of non-migrants. This is called the "dependence" effect of international migration. Whether this effect is strong or even present depends on family ties and dynamics; strong family connections mean larger and more stable flows of remittances which tend to stimulate the dependence effect (Rodriguez and Tiongson 2001, p 713).

In the absence of remittances, emigration would probably increase the households' labor supply since wages would rise due to the emigrated labor force, and since the households would have to replace the migrated family members' labor income. With remittances, however, migrant families may feel less need to work outside the home. For women, in particular, remittances can often decrease incentives to participate in the labor force and increase incentives to allocate more time to home production (Hanson 2007, p 3). Barajas et al (2009) argue that remittances are expected to have a negative influence on labor participation due to the fact that recipient households may substitute unearned income (remittances) from labor income. Remittances may also be plagued by severe moral hazard problems because of the asymmetric information of these flows, which leads to the recipient consuming more leisure than labor hours (ibid p 6-7). The effect of remittances on labor supply can however be positive if the households have the possibility of using the remittances for entrepreneurial or commercial activities (Jadotte, 2009 p 5).

Applying the model of the labor-leisure choice, we can form an econometric model of what impacts the decision of how many hours the individual should work. This will also give us an idea of whether the Jordanian households view remittances as a normal or an inferior good. The econometric model will constitute the method of this study.

5. Method and Data

5.1 Method

The method of this study is to first show the difference between heads of households that receive remittances to those who do not by demonstrating descriptive characteristics in tables. For the regression analysis, I will use a typical regression model which is represented by the following equation:

$$h_i = \beta w_i + \gamma V_i + \text{other variables} + \varepsilon_i \quad (3)$$

h_i is the number of hours that person i works, w_i gives her wage rate, and V_i is the non-labor income. The coefficient β measures the impact of a unit wage increase on hours of work, holding non-labor income constant, and the coefficient γ measures the impact of a unit increase in non labor income, holding the wage constant. The neoclassical model of labor-leisure choice implies that the sign of the coefficient γ depends on whether leisure is a normal or inferior good. According to this study's hypothesis and most of the empirics, leisure is regarded as a normal good which means that γ should be negative since workers with more non-labor income consume more leisure (Borjas 2008, p 27-37, 45-47).

The equation of the neoclassical labor supply model (3) will be applied in a modified form with more explanatory variables that indicate the type of characteristics that presumably affects the outcome in the labor market. It would have been more optimal to have the model above (3) where labor supply is measured by hours worked, but since the data I got permission to use from DOS does not contain this information, labor supply is estimated by using income from employment as a proxy. The following regression for labor supply will be used on data of household migration behavior:

$$L_s = \alpha + \beta_1 R_h + \beta_2 X_h + \varepsilon_h \quad (4)$$

where L_s is labor supply of households in the source country (income from employment is used as a proxy for labor supply), R_h is the amount of received remittances from migrants and X_h is a vector of the household's observable characteristics. As mentioned above, the variable

R_h is the same as non-labor income, V, which should, according to our hypothesis, decrease the number of hours worked and should therefore have a negative sign. The broader definition of remittances is taken from IMF's compilation of remittances (2009, p 1): "it essentially represents household income from foreign economies, mainly from temporarily or permanently moved people to those economies (...) Remittances include funds that flow through formal channels, such as electronic wire, or through informal channels, such as cash carried across borders in pockets. They may consist almost entirely of funds sent by individuals who have migrated to a new economy and become residents there, and of net compensation of border, seasonal, or other short-term workers who are employed in an economy in which they are not residents" (IMF 2009, p 1). The variable for remittances in the data used for this study is compatible with this definition.

Since income from employment is used as a proxy for labor supply, it is not possible to see to what extent each independent variable affects labor supply. However, the information can reveal if the effect is negative or positive, which then helps us understand this aspect of migration on the Jordanian economy.

The control variables that are included in the vector are chosen because of the assumption that they are likely to affect the labor supply in direct or indirect ways. This assumption is based on earlier research (e.g. Hanson 2007) and on the neoclassical model. One of the variables that the vector covers is the education rate of the receiving head of household (measured in years of schooling). The reason why we should control for the recipient's education rate is based on the assumption that the years of schooling a person has can have an effect on how many hours she works. According to Borjas (2008, p 499-500), the more educated a person is, the less is her risk of being unemployed. One can also relate it to the neoclassical model that says that if the income effect dominates, the higher the wage, the fewer hours will be spent working. The empirics demonstrate that the wage increases with higher education (ibid p 253-255). But because of the substitution effect that makes the hours of work increase due to a rise in the wage rate, being educated could also mean supplying more hours of labor. A more intuitive relation between education and labor supply is that a more educated person has higher ability and therefore more easily finds employment. The difference in education rate could also imply that the more educated people are, the keener they are to advance their careers and therefore work more (Björklund et al 2006, p 132-137). Hence, one needs to control for education in the regression analysis. It can also be convenient to control for the age profile of the recipient because it is likely that it has an effect on the labor supply with the hours worked increasing with the age (at least up to a certain level)

(Borjas 2008, p 64). Variables such as the receiver's number of children, the marital status of the head of household, if the household is situated in an urban or a rural area, and the nationality of the remittance-receiving household, are also likely to have an impact on the decision to work. These variables are chosen based on earlier studies on what affects the recipient households' (and individuals') choice of how many hours to spend working. The number of children plays an important role in determining the labor supply. Empirical studies of both developing and industrial countries show that more children in a household will decrease the mothers' labor supply, and some empirical studies also indicate a negative effect on the fathers' hours worked (Kalb 2009, p 278). For men, being married means supplying more labor according to several empirical analyses. For women, on the other hand, being married means working fewer hours to allocate their time to housework (ibid p 18). Including nationality (or ethnicity) in the regression analysis could also be important since this is likely to affect the labor supply. Earlier studies on the role of nationality in labor supply show that natives are more likely to be employed and therefore supply more labor (see for example Borjas 2011). Living in an urban or rural area could affect the labor supply depending on if the areas are more conservative (when it comes to allowing female labor participation), what type of industries there are and what the working opportunities look like (see for example Yukiko 2011).

The result of this regression will give an estimation of a correlation. A regression analysis that gives an estimation of the causal effect would require a solution to an omitted variable bias. Omitted variable bias is a common problem in migration and remittances analysis since there could be unobserved differences between households with migrant members and households without migrant members. These differences explain why households have migrants in the first place (Thapa 2008, p 15-16 and Rodriguez and Tiongson, 2001, p 719). Furthermore, migration is not a random event. Households choose to send migrants abroad based on the perceived gains from doing so. Observable characteristics such as income, education and wealth, and unobservable such as ability and income shocks for the remittances sender, are all likely to affect the decision to migrate (Hanson 2007, p 3 and Acosta 2006, p 3). This study takes the heterogeneity of the households into account by adding observable household characteristics in the regression analysis but does not account for any other household characteristics that are not observable. A panel structure could be a solution to the omitted variable bias by including households' fixed effects and, in this way, exploit the variability of remittances within a household across time. However, there exist no panel data on household income and expenditure in Jordan so this is not a possible solution.

5.2 Data

The data used for this study is taken from the income and expenditure surveys conducted in 1966, 1980, 1986/1987, 1992, 1997, 2002, 2006 and 2008 by the Department of Statistics (DOS) in Jordan. I got permission to use the surveys from 2002, 2006 and 2008. The sample of 2008 was designed by using a two-staged cluster stratified sampling method. The questionnaire of 2008 included three integrated questionnaires: a general questionnaire with the housing unit characteristics, the household members' characteristics and the income comprising three parts (household ownership of assets, household productive activities and current income sources), expenditure on food items and recurring goods and expenditure on non-food items. The questionnaires for 2002 and 2006 were similar and all the questions I used for my analysis were included in all of the three surveys.

The surveys are on the level of heads of households and the numbers of households investigated in the surveys are different from each survey but are between 10,500 to 11,100.

The households' current income generally consists of six types. The first one is the income from employment that includes cash salaries and wages, in-kind benefits and income from own-account workers and of employers. Cash wages and salaries consist of cash income accruing to a person in return for work he performs for others, whether that work is major or secondary, including any kind of allowances and remunerations. Severance pay and wages and salaries during illness leave exceeding one month including maternity leaves, are excluded from in cash wages and salaries. Cash salaries and wages also include the accruals to individuals in return for part time job performed to others, such as private tuition teacher, or accountants for short periods etc. The in-kind benefits consist of estimated cash values for in-kind items provided by employers to employees as an alternative or in addition to in cash salaries or wages, such as housing for work, meals, transportation from and to work and travel tickets. Income from own-account workers and employers is the mixed cash income from wages and ownership accruing to any household member from an establishment he owns. These incomes (net income after deducting the production intermediaries) are realized from private professions, such as doctors, engineers, lawyers, and from non–organized private family establishments whether commercial, industrial or agricultural.

The second one is rental income divided into building rents and other rents (non-building items). The third is property income which is defined as payments due to an owner of a

financial or non-financial asset in return for providing money or keeping the non-financial asset at the disposal of others. It consists of land rent, interests and dividends and profits of shares and partnerships. The fourth one is transfer income and it is in this post that we find what constitutes remittances. The transfer income is total cash amounts plus estimated cash value of goods and services received by a household from others, without any commitment to work or providing financial or non-financial asset (free of charge). These amounts are usually transferred periodically for financing the consumption expenditure of the household. They are divided into pension income, social security dues, accrual insurance compensation, gifts and other current transfers. Other current incomes are cash amounts received by a household member, not as a gift, or in return for previous work or damage caused to him, but basically for assistance. These transfers could be from resident or non-resident parties. The transfers from non-residents constitute remittances. The fifth and last type of household income is other incomes, which include cash amounts or the estimated cash value of what is presented in-kind to a household from income sources other than those mentioned earlier, such as in-cash or in-kind prizes (DOS 2008).

One can define labor supply in different ways and the most common measure of labor supply is the labor force participation rate, which is usually measured in numbers of hours worked. Since the surveys from which I get my data do not include information about hours worked for the head of household, I use income from employment as a proxy for hours worked.

One possible bias with the variable that represents the amount of received remittances is that remittances often tend to be underreported in household survey data when compared to macroeconomic balance of payments (Acosta 2006, p 22). Measurement errors in the reported amount received in remittance might lead to a downward bias in the coefficient of the impact of remittances on households' outcome.

The analyses are done separately for women and men, for different age groups, for urban and rural situated households and for households with and without children. I will also make regressions separately with and without the different types of transfers to control that the transfers are not variables that need to be included in order to get more significant results (see Westerlund 2005, p 127-128). The analyses are made separately for each survey, and the years are not merged since the aim is to see if there is any difference between the years. The data is first selected to avoid excluding those heads of households that are outside the labor force. Students, pensioners and unemployed are withdrawn in the analysis by excluding those with pensions and insurance pensions, those over the age of 15 years, those who are still in

school and those who have not worked during the last seven days. By making these restrictions the effects of unemployment are avoided in the analyses. After these restrictions, the number of male heads of households in 2002 is 5,385 and the female heads of households 50. For 2006 the male heads of households are 5,790 and female 61. For year 2008, 5,812 male head of households and 62 female are in the sample. The female heads of households decrease considerably after doing these selections, which is shown by the fact that the total number of female heads of households that for 2002 is 1,109, for 2006 it is 1,365 and for 2008 it is 1,359. The main reason for the decrease is most likely the selection where the female heads of households not employed are excluded. This is a reasonable effect since Jordanian women face several obstacles (like prohibitive norms) when trying to enter the labor force (Economic and Social Council, Jordan 2011).

When doing the regression I constructed dummy variables of marital status, nationality and if the household was situated in an urban or in a rural environment since these variables were string variables in the data. Other variables that I transformed were a variable for logarithmic income and a quadratic age variable.

6. Descriptive Statistics on Remittances

Before starting with the analysis it could be interesting to present the remittance-receiving and labor participation pattern to see if there is any kinds of heads of household that tend to receive more remittances than others, and if there is any group that seems to supply more labor. Table 6.1 shows that among the total number of heads of households the percentage of households receiving remittances declined from 2002 to 2008. This result is a bit surprising since the oil price boom during 2003 to 2008 led to a strengthened economy among the Gulf countries (IMF 2010, p 4) which should have increased the demand for labor from Jordan and hence also increased the flows of remittances to Jordan. If the head of households are separated to see if there is any difference in remittance-receiving between men or women, one can see that it is much more common that the households receive remittances if the head of household is a woman.

It could also be interesting to make a distinction between whether the household is in an urban or a rural area. One could think that receiving remittances should be more common in rural areas as these kinds of transfers can work as an insurance mechanism in volatile environments with incomplete credit markets (Acosta 2006, p 19). This is not the case in Jordan when looking at the results in table 6.1. The households situated in the urban areas are more likely to receive remittances than those in the rural areas. One possible explanation could be that since migration is costly, those households that can afford a family member migrating are more likely to receive remittances. The urban areas in Jordan have wealthier inhabitants (DOS 2011a).

Table 6.1. Head of households receiving remittances

	Year		
	2002	**2006**	**2008**
Remittance-receiver in %			
Total	11.1	8.0	5.4
Men	9.6	7.0	4.2
Women	23.5	17.9	14.2
Urban	13.1	9.4	6.5
Rural	6.1	2.8	1.3

Source: Authors calculation based on data from IAES, DOS, Jordan, 2002, 2006 and 2008.

Table 6.2. Labor Participation for Head of Households.

	Year		
Labor participation (worked last 7 days)	**2002**	**2006**	**2008**
Non-receiving remittances (in %)			
Total	61.6	57.0	59.1
Men	68.2	64.0	66.6
Women	6.0	4.7	4.9
Receiving remittances (in %)			
Total	47.7	34.7	30.1
Men	60.1	44.9	42.0
Women	4.2	6.1	5.2

Source: Authors calculation based on data from IAES, DOS, Jordan, 2002, 2006 and 2008.

Table 6.2 shows the difference in labor participation between the households that receive remittances and the households that do not. As expected, men are more likely to be currently working. Around 60 percent of the male heads of households claim that they have been working the last 7 days prior to when the survey was conducted relative to 4-6 percent of the female head of households. There seems to be a tendency of less labor supplied if receiving remittances for both men and women. For both the recipients and the non-recipients, women supply less labor than men. From a traditional perspective, men are more likely to undertake work outside the household and assume the responsibility of providing for the family. Men may be considered more productive in undertaking work outside the household, while women are left in charge of home production (Rodriguez and Tiongson 2001, p 713-714). A regression analysis could now be appropriate to use to see if this tendency could be somewhat confirmed.

7. Results and Discussion

As can be seen in table 7.1, the coefficient of remittances is significant at a 1 percent level with a negative sign for all the years, for both men and women and this is in line with the study's hypothesis that remittances affect labor supply negatively. This also supports some of the earlier empirical findings that leisure is a normal good. The results do not change appreciably for men when including other types of transfers shown in table 7.2.

Other interesting findings that we can see in table 7.1 are that significant results show that being married decreased the labor supply for men. For women on the other hand, being married increased their labor supply during the years 2002 and 2008. These findings are a bit unexpected since, as discussed in chapter 5.1, empirical analyses have shown that married women are more likely to supply less labor, while the opposite is the case for men.

From table 7.1 we also see that labor supply seems to be increasing with age (except for women in 2008) and you are more likely to supply more labor if you have Jordanian nationality. Having more children means less labor supplied if you are a woman for the years 2002 and 2008. This is also the case for men for all of the years, contradicting earlier studies saying that having more children means working more hours.

The higher education both female and male Jordanian heads of households have, the more likely they are to supply more labor. The probable explanation is that the more educated a person is, the more likely it is that she has a higher wage and therefore she will supply more labor.

Urban situated male households tend to supply less labor than the rural. This could possibly be explained by the higher unemployment in the urban areas (see DOS 2011a where the governorates with larger urban areas have a much higher percentage than those with more rural areas). For female heads of households there seems to be a tendency of supplying more labor if situated in an urban area for the years 2006 and 2008, and this is likely since unemployment for women for these years were higher in the rural areas than in the urban (DOS 2011f and DOS 2011g).

Table 7.1: Regression results of head of household labor supply

Variables	2002		2006		2008	
	Men	**Women**	**Men**	**Women**	**Men**	**Women**
Age squared	-0.167***	-0.293	-0.184***	-2.612***	-0.213***	1.763***
	(0.011)	(0.183)	(0.008)	(0.107)	(0.007)	(0.110)
Age	0.032***	0.021	0.032***	0.239***	0.034***	-0.124***
	(0.001)	(0.015)	(0.001)	(0.009)	(0.001)	(0.009)
Married	-0.072***	0.082***	-0.021***	-0.521***	-0.107***	0.362***
	(0.009)	(0.029)	(0.008)	(0.024)	(0.007)	(0.023)
Urban	-0.054***	-0.368***	-0.031***	0.287***	-0.041***	0.257***
	(0.003)	(0.030)	(0.003)	(0.037)	(0.002)	(0.029)
Number of children	-0.007***	-0.032***	-0.022***	0.054***	-0.023***	-0.034***
	(0.001)	(0.006)	(0.001)	(0.007)	(0.001)	(0.006)
Years of schooling	0.070***	0.047***	0.065***	0.021***	0.066***	0.131***
	(0.000)	(0.002)	(0.000)	(0.003)	(0.000)	(0.002)
Jordanian	0.249***	0.495***	0.117***	0.826***	0.144***	-0.006
	(0.006)	(0.079)	(0.004)	(0.036)	(0.004)	(0.036)
Remittances	-0.061***	-0.064***	-0.018***	-0.072***	-0.092***	-0.289***
	(0.002)	(0.007)	(0.001)	(0.007)	(0.002)	(0.008)
R square	0.210	0.212	0.227	0.416	0.228	0.581
Number of observations	5,385	50	5,790	61	5,812	62

Note: * Significant at 10 % level. **Significant at 5 % level. ***Significant at 1% level. Standard errors in parentheses.

From table 7.2 we can see that the coefficient of determination, R square, is larger for women than it is for men. The different transfers included can then better explain the labor supply of women but do not show any difference between the effects remittances have on women's and men's labor supply.

What table 7.2 also demonstrates is that information on how social benefits affect labor supply only could be found for male heads of households for 2002 and 2006. The reason for this could be that I excluded the unemployed heads of households before running the regressions. The social benefits are paid out from the Jordanian Social Security Corporation to workers after the termination of their services or as a result of an occupational accident which could lead to the worker not being able to work for a period. It is more probable that the unemployed receive support like social benefits, and when excluding these, few heads of households receive these transfers.

The variables of other current transfers from the government for women in 2006 and 2008 and non-governmental transfers for the same years are missing. This could imply that women do not receive this type of transfers. Other significant results from table 7.2 are that most of the different transfers affect labor supply negatively. The exceptions are gifts in cash for all of

the years and for both men and women (except for women in 2006). This could be due to the fact that if a household receives extra income as gifts, the members have more opportunities to engage their time in entrepreneurship which then raises the labor supply.

Table 7.2: Regression results of head of household labor supply including different types of transfers

Variables	2002		2006		2008	
	Men	**Women**	**Men**	**Women**	**Men**	**Women**
Age squared	-0.151***	-0.311**	-0.175***	-2.445***	-0.202***	1.782***
	(0.011)	(0.145)	(0.008)	(0.096)	(0.007)	(0.111)
Age	0.030***	0.030**	0.030***	0.225***	0.033***	-0.124***
	(0.001)	(0.012)	(0.001)	(0.008)	(0.001)	(0.009)
Married	-0.105***	-0.104***	-0.031***	-0.715***	-0.133***	0.522***
	(0.009)	(0.030)	(0.008)	(0.024)	(0.007)	(0.025)
Urban	-0.060***	-0.116***	-0.025***	0.219***	-0.043***	0.187***
	(0.003)	(0.043)	(0.003)	(0.037)	(0.002)	(0.032)
Number of children	-0.006***	0,021***	-0.020***	0.119***	-0.022***	-0.005
	(0.001)	(0.006)	(0.001)	(0.007)	(0.001)	(0.006)
Years of schooling	0.069***	0.022***	0.063***	0.026***	0.065***	0.124***
	(0.000)	(0.003)	(0.000)	(0.002)	(0.000)	(0.002)
Jordanian	0.253***	0.278***	0.127***	0.947***	0.150***	-0.097***
	(0.006)	(0.057)	(0.004)	(0.032)	(0.004)	(0.032)
Remittances	-0.064***	-0.056***	-0.020***	-0.076***	-0.091***	-0.358***
	(0.002)	(0.006)	(0.001)	(0.007)	(0.002)	(0.007)
Transfers (gifts, cash)	0.145***	1.236***	0.219***	-0.833***	0.036***	-0.422***
	(0.008)	(0.136)	(0.005)	(0.082)	(0.007)	(0.073)
Transfers (gifts, in kind)	-0.029***	-0.101***	0.182***	-0.101***	0.007***	0.079
	(0.008)	(0.031)	(0.006)	(0.095)	(0.005)	(0.096)
Transfers (other current transfers, govt)	-0.611***	0.217***	-0.276***	-0.026	-0.252***	-0.256***
	(0.014)	(0.027)	(0.013)	(0.100)	(0.009)	(0.023)
Transfers (other current transfers, govt, other govt)	0.289***	1.232***	-0.062***	-	-0.491***	-
	(0.010)	(0.192)	(0.011)		(0.039)	
Transfers (other current transfers, non-govt, households)	-0.045***	-3.378***	-0.163***	-0.615*	-0.103***	-0.163***
	(0.005)	(0.078)	(0.003)	(0.028)	(0.002)	(0.021)
Transfers (other current transfers, non-govt, non-profit inst)	-0.183***	-1.056***	-0.476***	-	0.875***	-4.138***
	(0.044)	(0.396)	(0.054)		(0.069)	(0.133)
Transfers, social benefits	0.008***	-	-0.084***	-	-	-
	(0.001)		(0.024)			
Transfers, non-govt, others	-0.157***	-0.028	0.070***	-	0.315***	-
	(0.019)	(0.037)	(0.005)		(0.010)	
R square	0.218	0.630	0.241	0.540	0.252	0.686
Number of observations	5,385	50	5,790	61	5,812	62

Note: * Significant at 10 % level. **Significant at 5 % level. ***Significant at 1% level. Standard errors in parentheses.

To see if there is any difference in how labor supply is affected by remittance between age groups, regressions are done for the following age groups: 16-24, 25-34, 35-44, 45-54 and 55-64. Since there are not enough female heads of households in the youngest age group, 16-24, and in the oldest, 55-64, regressions for these group are not done. What we can see from the results in tables 7.3 to 7.7 is that remittances affect labor supply negatively for men for all of the years and age groups with significance at a one percent level. The exceptions for the male heads of households with a significant positive effect are for the age groups 16-24 (survey year 2006) and 25-34 (survey year 2008). The other exceptions do not have significant effects (see tables 7.5 and 7.7). An extra income in the form of remittances increases the labor supply in the younger age groups which means that for them leisure is an inferior good. For women labor supply is affected negatively by remittances except for the age groups 25-34 for the year 2008, the age group 35-44 for 2006 (not significant) and the age group 45-54 for the years 2006 and 2008. The positive sign for some of the female age groups could be somewhat surprising since one would expect the women to be more involved in parenting and home production activities (see Acosta 2006, p 42) and with an extra income (remittances) this is more affordable. But as discussed earlier, remittances may help some female heads of households to engage in entrepreneurial activities.

Another result from these regressions is that male labor supply is increasing with age except for some cases (see table 7.4, 7.5 and 7.7). The exceptions are somewhat difficult to explain since labor supply usually increases with age up to a certain age. However, for the oldest age group where age has a significant negative sign for year 2002 and 2008 this could possibly be explained by the retirement age in Jordan being quite low (60 years for men and 55 for women) (Fanek 2011). For the other groups where age has a positive effect on labor supply, these results can be supported by the available evidence from earlier studies. Male participation rates generally rise from when they are 15 years old and peak at the age of 25 to 45. After 45 years, the participation rate starts to decline (Borjas 2008, p 66-68). The results in tables 7.4 to 7.6 for women show that a rise in age increases labor supply except for the age group 25-34 (only for 2008). The positive effect age has on labor supply for some of the older female age groups is in line with the empirical research that says that since women's participation rate probably is affected by child-raising-activities, their rates peak later than men's (Borjas 2008, p 67-68).

According to the results, there does not seem to be any clear tendency that being married means supplying more labor or not. For the older age groups (see tables 7.5, 7.6 and 7.7) where the variable married has a negative sign, one possible explanation could be that if a

man is married he most likely has a family so that his grown up children can give him financial support which could make him supply less labor. There does not seem to be any clear tendency that being married as a female head of household means supplying more labor.

For both women and men, and for all the survey years, having more years of education means more labor supplied. Only for women in the age group 25-34 (survey year 2006) and 35-44 (survey year 2002) having more education means supplying less labor. However, none of the effects are significant.

To live in an urban area means mostly supplying less labor. This could be explained by the higher unemployment in the urban areas (DOS 2011b, DOS 2011c, DOS 2011d, DOS 2011e).

When it comes to number of children for male heads of households, this means that most of the age groups supply less labor. One would think that having more children as a male head of household would mean working more hours as the head of household has more people to support. This does not seem to be the case for the male heads of households when looking at the results in table 7.3 to 7.7. There does not seem to be any clear tendency of supplying less labor when having more children for the female head of household. Results from other studies with similar regressions have shown that the female labor supply usually declines with the number of children since the female members have to spend more time taking care of their children, which reduces hours of work (see Thapa 2008 p 24).

Tables 7.3-7.7 also show that if the head of household is Jordanian the household will supply more labor. The exceptions are for some of the male heads of households for survey years 2006 and 2008 for the age group 16-24 and for the oldest age group for all the years (survey year 2008 is not significant). A probable explanation for this could be that if you belong to the younger age group and are Jordanian, you are more likely to spend your time on education or be supported by your family, which could mean supplying less labor. If you are not Jordanian, you probably are a working immigrant, which means you supply a lot of labor to be able to send home income to your family abroad. This is often the case for the many Egyptians and people from Asia who work in Jordan (Chatelard 2010). If you are in the oldest age group, however, being Jordanian means you have the right to a pension which allows you to supply less labor.

Table 7.3: Regression results of male head of household labor supply. Age group 16-24

Variables	2002		2006		2008	
	Men	**Women**	**Men**	**Women**	**Men**	**Women**
Age squared	-23.573***	-	-14.358***	-	2.406	-
	(2.730)		(2.031)		(1.726)	
Age	1.092***	-	0.585***	-	0.019	-
	(0.119)		(0.088)		(0.076)	
Married	-0.440***	-	0.300***	-	-0.095***	-
	(0.019)		(0.017)		(0.011)	
Urban	-0.069***	-	-0.306***	-	-0.180***	-
	(0.017)		(0.017)		(0.010)	
Number of children	-0.061***	-	0.197***	-	-0.074***	-
	(0.007)		(0.009)		(0.004)	
Years of schooling	0.072***	-	0.061***	-	0.046***	-
	(0.003)		(0.002)		(0.002)	
Jordanian	0.362***	-	-0.323***	-	-0.428***	-
	(0.043)		(0.018)		(0.018)	
Remittances	-4.311***	-	1.496***	-	-0.129***	-
	(0.836)		(494)		(0.003)	
R square	0.204	-	0.232	-	0.377	-
Number of observations	119	-	81	-	116	-

Note: * Significant at 10 % level. **Significant at 5 % level. ***Significant at 1% level. Standard errors in parentheses.

Table 7.4: Regression result of head of household labor supply. Age group 25-34

	2002		2006		2008	
	Men	**Women**	**Men**	**Women**	**Men**	**Women**
Age squared	0.884***	-	-2.002***	-0.328***	1.999***	17.707***
	(0.234)		(0.177)		(0.170)	(1.974)
Age	-0.033**	-	0.134***	0.025***	-0.096***	-1.045***
	(0.014)		(0.011)	(0.000)	(0.010)	(0.114)
Married	0.043***	-	0.063***	-	-0.261***	0.819***
	(0.011)		(0.008)		(0.007)	(0.025)
Urban	-0.058***	-	-0.023***	-	-0.031***	0.848***
	(0.004)		(0.003)		(0.003)	(0.026)
Number of children	0.003**	-	-0.016***	-0.013***	-0.010***	-0.244***
	(0.001)		(0.001)	(0.000)	(0.001)	(0.009)
Years of schooling	0.069***	-	0.063***	-0.019***	0.063***	0.145***
	(0.001)		(0.000)	(0.000)	(0.000)	(0.003)
Jordanian	0.212***	-	0.129***	0.268***	0.209***	-
	(0.009)		(0.006)	(0.000)	(0.006)	
Remittances	-0.111***	-	-0.216***	-0.120***	0.065***	0.050**
	(0.005)		(0.012)	(0.000)	(0.008)	(0.020)
R square	0.171	-	0.198	0.569	0.196	0.865
Number of observations	1,788	-	1,668	9	1,713	13

Note: * Significant at 10 % level. **Significant at 5 % level. ***Significant at 1% level. Standard errors in parentheses.

Table 7.5: Regression result of head of household labor supply. Age group 35-44

	2002		2006		2008	
	Men	**Women**	**Men**	**Women**	**Men**	**Women**
Age squared	-0.892***	-25.950***	6.327***	-3.370	2.063***	-56.162***
	(0.227)	(1.915)	(0.179)	(2.159)	(0.173)	(2.718)
Age	0.081***	2.090***	-0.478***	0.347**	-0.147***	4.169***
	(0.018)	(0.151)	(0.014)	(0.172)	(0.014)	(0.207)
Married	-0.093**	-0.295***	0.029*	-0.112***	0.098***	0.289***
	(0.042)	(0.025)	(0.018)	(0.035)	(0.018)	(0.056)
Urban	-0.023***	0.016	0,005	-	-0.021***	0.286**
	(0.004)	(0.016)	(0.004)		(0.004)	(0.035)
Number of children	-0.014***	-0.015***	-0.014***	-0.052***	-0.005***	-0.054***
	(0.001)	(0.006)	(0.001)	(0.015)	(0.001)	(0.008)
Years of schooling	0.076***	-0.003	0.071***	0.114***	0.074***	0.152***
	(0.000)	(0.003)	(0.000)	(0.007)	(0.000)	(0.005)
Jordanian	0.191***	0.470***	0.170***	-	0.135***	0.133***
	(0.011)	(0.054)	(0.006)		(0.006)	(0.036)
Remittances	-0.163***	1.088***	0.005	0.049**	-0.059***	-0.355***
	(0.006)	(0.071)	(0.003)	(0.020)	(0.003)	(0.016)
R square	0.210	0.448	0.214	0.353	0.219	0.869
Number of observations	1,881	19	2,259	20	2,122	18

Note: * Significant at 10 % level. **Significant at 5 % level. ***Significant at 1% level. Standard errors in parantheses.

Table 7.6: Regression result of head of household labor supply. Age group 45-54

	2002		2006		2008	
	Men	**Women**	**Men**	**Women**	**Men**	**Women**
Age squared	-1.058***	-21.171***	-6.480***	-14.028***	-5.684***	-19.054***
	(0.412)	(2.603)	(0.348)	(1.162)	(0.302)	(0.902)
Age	0.132***	2.136***	0.649***	1.342***	0.573***	1.870***
	(0.041)	(0.257)	(0.034)	(0.114)	(0.030)	(0.088)
Married	-0.300***	0.396***	-0.387***	-0.915***	-0.198***	-2.406***
	(0.033)	(0.072)	(0.046)	(0.024)	(0.044)	(0.143)
Urban	-0.093***	-2.262***	-0.019**	-0.060**	-0.083***	-
	(0.009)	(0.055)	(0.008)	(0.029)	(0.007)	
Number of children	0.003	-0.380***	-0.027***	0.028**	-0.043***	1.640***
	(0.002)	(0.014)	(0.002)	(0.011)	(0.001)	(0.076)
Years of schooling	0.070***	0.134***	0.066***	0.021***	0.062***	0.080***
	(0.001)	(0.007)	(0.001)	(0.002)	(0.001)	(0.002)
Jordanian	0.484***	-	0.163***	1.202***	0.098***	2.001***
	(0.016)		(0.011)	(0.028)	(0.011)	(0.045)
Remittances	-0.145***	-0.041**	-0.019***	0.028***	-0.169***	0.125***
	(0.005)	(0.019)	(0.005)	(0.005)	(0.006)	(0.014)
R square	0.173	0.784	0.163	0.842	0.141	0.851
Number of observations	966	19	1,152	23	1,208	19

Note: * Significant at 10 % level. **Significant at 5 % level. ***Significant at 1% level. Standard errors in parentheses.

Table 7.7: Regression result of head of household labor supply. Age group 55-64

	2002		2006		2008	
	Men	**Women**	**Men**	**Women**	**Men**	**Women**
Age squared	-2.934***	-	2.867***	-	-0.679	-
	(0.750)		(0.650)		(0.546)	
Age	0.339***	-	-0.355***	-	0.086	-
	(0.088)		(0.077)		(0.065)	
Married	0.265***	-	-0.687***	-	0.436***	-
	(0.044)		(0.058)		(0.038)	
Urban	-0.203***	-	-0.053***	-	-0.036***	-
	(0.017)		(0.015)		(0.013)	
Number of children	0.019***	-	-0.029***	-	-0.036***	-
	(0.003)		(0.003)		(0.003)	
Years of schooling	0.060***	-	0.052***	-	0.058***	-
	(0.001)		(0.001)		(0.001)	
Jordanian	-0.121***	-	-0.315***	-	-0.018	-
	(0.027)		(0.022)		(0.019)	
Remittances	-0.035***	-	-0.020***	-	0.002	-
	(0.002)		(0.001)		(0.006)	
R square	0.113	-	0.122	-	0.136	-
Number of observations	481	-	518	-	491	-

Note: * Significant at 10 % level. **Significant at 5 % level. ***Significant at 1% level. Standard errors in parentheses.

Table 7.8 shows regression which includes households without children and table 7.9 households with children. There is no difference in the effect remittance has on households' labor supply. Remittances affect the households' labor supply negatively regardless if the households have children or not.

Table 7.8: Regression result of head of household labor supply. Households without children

	2002		2006		2008	
	Men	**Women**	**Men**	**Women**	**Men**	**Women**
Age squared	-0.042*	0.466***	0.180***	0.113	0.324***	1.581***
	(0.023)	(0.048)	(0.019)	(0.161)	(0.013)	(0.127)
Age	0.017***	-0.040***	0.032***	0.020	0.044***	-0.142***
	(0.017)	(0.004)	(0.002)	(0.014)	(0.001)	(0.011)
Married	-0.088***	-	-0.041***	-0.626***	-0.096***	-
	(0.014)		(0.011)	(0.086)	(0.009)	
Urban	0.069***	-	-0.193***	0.160***	0.022***	-
	(0.012)		(0.010)	(0.055)	(0.012)	
Number of children	-	-	-	-	-	-
Years of schooling	0.063***	0.024***	0.070***	0.056***	0.058***	0.148***
	(0.001)	(0.001)	(0.001)	(0.004)	(0.001)	(0.002)
Jordanian	-0.093***	-	-0.040***	0.672***	0.253***	0.770***
	(0.034)		0.013)	(0.038)	(0.012)	(0.048)
Remittances	-0.015***	-61.981***	-0.088***	-0.500***	-0.095***	-0.059***
	(0.002)	(0.523)	(0.005)	(0.024)	(0.003)	(0.021)
R square	0.136	0.976	0.226	0.663	0.224	0.737
Number of observations	597	16	720	29	819	28

Note: * Significant at 10 % level. **Significant at 5 % level. ***Significant at 1% level. Standard errors in parentheses.

Table 7.9: Regression result of head of household labor supply. Households with children

	2002		2006		2008	
	Men	**Women**	**Men**	**Women**	**Men**	**Women**
Age squared	-0.125***	-0.998***	-0.067***	-0.766***	-0.170***	2.346***
	(0.013)	(0.262)	(0.010)	(0.232)	(0.010)	(0.182)
Age	0.030***	0.063***	0.023***	0.092***	0.031***	-0.141***
	(0.001)	(0.021)	(0.001)	(0.019)	(0.001)	(0.015)
Married	-0.138***	0.075**	-0.367***	-0.324***	-0.154***	0.434***
	(0.016)	(0.030)	(0.018)	(0.018)	(0.015)	(0.030)
Urban	-0.058***	-0.377***	-0.013***	0.051	-0.050***	0.132***
	(0.003)	(0.030)	(0.003)	(0.036)	(0.002)	(0.028)
Number of children	-0.017***	-0.064***	-0.033***	0.005	-0.018***	-0.001
	(0.001)	(0.007)	(0.001)	(0.006)	(0.001)	(0.009)
Years of schooling	0.070***	0.045***	0.064***	0.062***	0.068***	0.161***
	(0.000)	(0.003)	(0.000)	(0.003)	(0.000)	(0.004)
Jordanian	0.278***	0.572***	0.142***	-	0.126***	-0.467***
	(0.006)	(0.079)	(0.004)		(0.004)	(0.059)
Remittances	-0.142***	-0.068***	-0.017***	-0.008	-0.084***	-0.338***
	(0.003)	(0.007)	(0.001)	(0.005)	(0.003)	(0.011)
R square	0.228	0.270	0.234	0.495	0.226	0.623
Number of observations	4,788	34	5,070	32	4,993	34

Note: * Significant at 10 % level. **Significant at 5 % level. ***Significant at 1% level. Standard errors in parentheses.

Only data for male heads of households could be found for both the selection of urban and rural households. Tables 7.10 and 7.11 show that there is no difference when it comes to the effects remittance has on the labor supply between the rural and urban households. For both rural and urban households, remittances affect the labor supply negatively.

Table 7.10: Regression result of head of household labor supply. Urban households

	2002		2006		2008	
	Men	**Women**	**Men**	**Women**	**Men**	**Women**
Age squared	-0.033***	-0.011	-0.218***	-2.363***	-0.184***	2.141***
	(0.012)	(0.200)	(0.009)	(0.109)	(0.008)	(0.115)
Age	0.021***	-0.005	0.034***	0.213***	0.032***	-0.160***
	(0.001)	(0.017)	(0.001)	(0.009)	(0.001)	(0.010)
Married	-0.109***	0.028	0.003	-0.596***	-0.052***	0.594***
	(0.010)	(0.032)	(0.008)	(0.026)	(0.008)	(0.026)
Urban	-	-	-	-	-	-
Number of children	0.001	-0.007	-0.021***	0.055***	-0.022***	-0.105***
	(0.001)	(0.008)	(0.001)	(0.007)	(0.001)	(0.007)
Years of schooling	0.072***	0.055***	0.068***	0.023***	0.068***	0.137***
	(0.000)	(0.003)	(0.000)	(0.003)	(0.000)	(0.002)
Jordanian	0.248***	0.503***	0.132***	0.827***	0.122***	-0.003
	(0.007)	(0.085)	(0.005)	(0.036)	(0.004)	(0.036)
Remittances	-0.125***	-0.062***	-0.018***	-0.061***	-0.088***	-0.288***
	(0.002)	(0.007)	(0.001)	(0.007)	(0.002)	(0.008)
R square	0.224	0.169	0.240	0.421	0.233	0.611
Number of observations	4,014	37	4,770	52	4,709	52

Note: * Significant at 10 % level. **Significant at 5 % level. ***Significant at 1% level. Standard errors in parentheses.

Table 7.11: Regression result of male head of household labor supply. Rural households

	2002		2006		2008	
	Men	**Women**	**Men**	**Women**	**Men**	**Women**
Age squared	-0.871***	-	0.176***	-	-0.420***	-
	(0.025)		(0.023)		(0.017)	
Age	0.089***	-	0.003	-	0.052***	-
	(0.002)		(0.002)		(0.001)	
Married	0.044**	-	-0.309***	-	-0.340***	-
	(0.020)		(0.023)		(0.013)	
Urban	-	-	-	-	-	-
Number of children	-0.034***	-	-0.019***	-	-0.036***	-
	(0.001)		(0.001)		(0.001)	
Years of schooling	0.056***	-	0.040***	-	0.054***	-
	(0.001)		(0.001)		(0.001)	
Jordanian	0.424***	-	0.008	-	0.721***	-
	(0.037)		(0.012)		(0.019)	
Remittances	-0.017***	-	-0.390***	-	-0.889***	-
	(0.002)		(0.028)		(0.021)	
R square	0.163	-	0.144	-	0.220	-
Number of observations	1,371	-	1,020	-	1,103	-

Note: * Significant at 10 % level. **Significant at 5 % level. ***Significant at 1% level. Standard errors in parentheses.

From the regressions presented in the tables above, there does not seem to be any clear trends from year to year. This could possibly be explained by the fact that the time period 2002-2008 is relatively too short for more important changes to be observable. As discussed in 5.2 above, the number of female heads of households is very limited since they do not participate in the labor force as much, and since they meet a higher unemployment rate. For many of the subgroups it has not been possible to make regressions since the number of observations has been too small. However, since there are significant results in the main group for female heads of households (see table 7.1), one can therefore still make assumptions of how remittances affect the labor supply for women.

8. Concluding Remarks

Remittances are probably one of the more important ways in which emigration affects the Jordanian economy. Since the beginning of the 1990s, remittances have been rising steadily. This study has investigated how remittances affect labor supply in Jordan by applying the neoclassical model of labor-leisure choice and using data from household surveys of income and expenditure. The results from the regressions show that remittances affect labor supply negatively for both men and women and for all of the years 2002, 2006 and 2008 and this is consistent with the traditional assumptions of leisure as a normal good, which strengthens this study's hypothesis. These findings indicate that the positive effects of remittances may be offset by lower labor force participation. Earlier estimates of the contribution of remittances to the macroeconomic outcome in Jordan may then be overstated. The result is interesting since it somewhat confirms the view that Jordan's dependency on remittances is a challenge to the Jordanian economy.

When dividing the heads of households into different age groups, one can see that remittances affect labor supply positively for some of the age groups, but there does not seem to be any consistent trend of supplying more labor in any age group. Therefore, the conclusion remains that remittances overall affect labor supply negatively. The households tend to supply less labor when receiving this extra type of income instead of using it to engage in entrepreneurial activities.

A possible solution to reduce this negative effect could be to adopt mechanisms that benefit the entrepreneurial activities in which remittances could be invested. In this way, the remittances would increase productivity and contribute to the economic growth of the country.

The results of this study could be affected by omitted variable bias and therefore extended data is needed. In order to clarify the long-term implications of remittances for the Jordanian economy, other development impacts of remittance, like the effect on poverty or children's school attendance, could be subject to further research. The research on how remittances affect the Jordanian labor supply could be extended to include uncertainty of the future streams of remittances in the analysis, since this will probably affect the labor supply decision of households as well.

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