SIDE EFFECTS OF THE 2009 NOMINAL EXCHANGE RATE VOLATILITY IN MEXICAN REMITTANCES´ PURCHASING POWER

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Abstract:

The Great Recession emerged as an usual world macroeconomic imbalance, determined by an exchange rate volatility and severe setbacks in international trade, foreign direct investment and flow of labor force. As Western countries tackle their high fiscal deficit and public debt problems, they face historical levels of unemployment. That has made them constrain international immigration, both legal and illegal. Mexico has experienced in this context a fall in remittances as well as in the number of workers leaving for the USA. On the other hand, exchange rate volatility has affected purchasing power of the remittances´ recipient families, making them supposedly better off when the MXN depreciates. In order to estimate the net changes in purchasing power, incomes coming from remittances have to be matched with domestic prices, especially of those items which households consume the most.

Key Words: Nominal exchange rate, side effects, Mexican remittances

Introduction

Migration has been an important topic since the 90´s due to the increasing number of people moving around the world trying to escape poverty, climate change or political restrictions. In hindsight, present migration is still below the dimensions reached at the beginning of the XX century. Abramitzky (et al, April, 2012: 1) for instance, writes that the US absorbed 30 million immigrants between 1850 and 1913, and that by 1910, 22 percent of the US labor force was foreign born, compared with 17 percent today. Based on the results of several studies, the liberal British magazine The Economist (January 5th 2008: 16) concluded that, "if labour flowed without restrain, social and political systems would be disrupted on a huge scale, but global poverty would be vastly relieved". The same magazine emphasized, "because immigrants see the world through more than one cultural lens, they often spot opportunities invisible to their monocultural neighbours" (The Economist, November 19th 2011). Bo and S. Jacks (2012: 28) find also that migration has a powerful effect in economic growth and foreign trade. Furthermore, Alan Greenspan (2008) stated that migration also has a high potential to neutralize the economic setbacks derived from the aging population in the industrialized countries. However, the world economic crisis of 2007-2010, has unleashed a wave of protectionist policies that have restrained not only foreign direct investment (e.g. through expropriations and exclusion of strategic sectors), but the free flow of merchandise and services, as well as the labor force. Mainly the United States of America and Western Europe have recently implemented several restrictions to stop illegal migration, which turns people into criminals when entering their countries without permission. At the same time, this economic crisis has caused a volatility in the exchange rate market. Countries trying to offset the loss of competitiveness that appreciations bring with, interviene in the exchange rate market contribuiting to a currency war.

Several economic actors who trade in foreign currency see themselves seriously affected by the nominal exchange rate (NER) volatility. A sudden appreciation of the NER makes exports less competitive but relieve debtors who can buy foreign currency cheaply. On the other hand, a depreciation can make a dent in debtors and importers budgets but it benefits exporters and families receiving remittances, since their income in terms of local currency increases. In this paper, we

analyzed whether or not households receiving remittances become better off in real terms by a currency depreciation. Thus we pose the following questions: to what extend does the economic crisis of 2009 affect remittances in Latin America? How has the USA confronted the problem of illegal immigration and what is the main cause of this policy? How have anti-immigration laws, the economic crisis and exchange rate affected the recipient families of remittances in Mexico? What have been the effects of exchange rates volatility in the purchasing power of families receiving remittances? To answer these questions we have divided our paper into four sections. Section I gives a snapshot of the consequences the *Great Recession* (Krugman, 2009; Stiglitzt, 2010) had in remittances flowing to Latin American and the Caribbean. Section II outlines the main changes in US immigration policy, especially the recent antiimmigration laws and their side effects in Mexico. In Section III we analyzed the importance of remittances in the Mexican economy and foreign exchange reserves, the correlation between NER volatility and remittances and the purchasing power of remittances in terms of food and fuel, taking as an example the price of tortillas and gasoline. In Section IV we explain what kind of strategies families depending on remittances have implemented in order to offset an income drop caused by the Great Recession. Section V summarizes and draws the main conclusions of this analysis.

Remittances in Latin America

The 2009 economic crisis considerably affected several countries of Latin America and the Caribbean, mostly those for which the share of remittances amounts to more than 10% of their GDP like El Salvador, Honduras, Guatemala, Nicaragua, Haiti and Guyana. Haiti, for instance, received 2.1 billion (bn) USD in 2010 an equivalent of more than 25% of its GDP. According to FOMIN (2009), the flow of remittances to Latin America diminished by 15% in 2009 as a consequence of the economic crisis. However, the depreciation of national currencies made it possible to increase the amount of remittances in terms of local currencies, counterbalancing the losses. Between 2002 and 2008 remittances increased from 31.2 bn USD to 69.2 bn USD or by 17% (FOMIN). Other sources such as the BID, state that Latin American remittances went from 28 bn USD in 2002 to 64.9 bn USD in 2009 (MDZ). Because of the 2009 economic crisis, this amount dropped by 15%, descending from 69.2 bn USD to 58.8 bn USD. Also the number of transfers diminished from 15.3 money orders a year in average in 2008 to only 12 money orders during 2009. Of all the countries receiving remittances in Latin America and the Caribbean, Mexico was the most affected in 2009 with a drop of 16%. Central American Countries registered a contraction of 9%, whereas the Caribbean, the Andean Region and South America experienced setbacks between 11% and 12%, except in the case of Brazil where remittances fell by 20% due to the return of a great number of immigrants who were enticed by the Brazilian Economic boom, as well as the loss of opportunities in the host countries. The government of Japan for instance, refused to renew the working visa for Brasilian imimmigrants. The Brazilian workers who came back home, brought savings with, propping up the amount of remittances in 2011 to almost 2.1 bn USD. It is worth mentioning that the main destinations of the majority of Latin American immigrants are The United States, Japan and Europe, especially Spain. Since those countries were affected by the crisis with a time span, the effects in remittances were, as well, different. Countries like Ecuador, for example, where remittances are distributed half and half between the United States and Spain, experienced a fall in money orders proceeding from the United States, but an increase by those coming from Spain.

The economic crisis depleted an important number of jobs in sectors where imimmigrants are usually employed like construction and agriculture. Many imimmigrants who were laid off, looked for alternatives in other sectors like sales and service. Employment for Latinos decreased by 3.71% on average during the first three quarters of 2009. By August 2009, the unemployment rate among Latinos skyrocked to 13%. A poll directed by FOMIN shows that 25% of imimmigrants who had lost their jobs still sent money back home to their relatives. The same source states that in spite of the losses in employment, the average income of immigrants in the US didn´t change throughout 2009. It has been observed that the amount of money sent by imimmigrants has a seasonal behavior; it is usually higher during traditional festivities like Christmas and Mother´s Day; however, this amount also decreased by 15% in 2009.

In 2011 remittances grew by 6% reaching 61 bn USD. Almost three-fourths of the regional remittances came from the United States and only 12% from Spain. This rebound can be attributed mostly to the economic recovery of the US economy, since the number of foreign workers in Spain

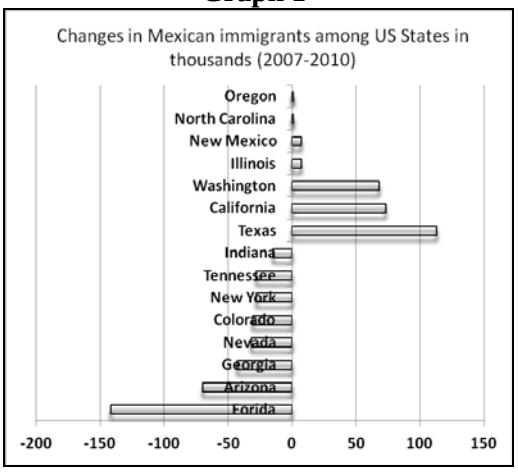
has diminished up 2009 by 2%. To begin with, this improvement in 2011 benefited Mexico and Central America which experienced an increment of 6.9% and 7% to reach 22.7 bn USD and 13.1 bn USD respectively. Secondly, Guatemala and El Salvador are the most important recipients with 4.3 bn USD and 3.6 bn USD respectively. Exchange rate variations benefited those countries which saw their currencies depreciate like Mexico whose remittances value in local currency increased by 17.5%. Countries like Brazil whose Real appreciated lost 15% of the value of remittances.

US Economic crisis and Mexican immigration

Illegal workers are the most vulnerable to economic crisis, but at the same time, they are the first to get back to work as soon as the economy rebounds. The construction sector, for instance, lost more than 600 000 jobs, downsizing the share of Mexicans from 25% to 17% in 4 years. Due to the recent economic recovery, the construction sector has reached the bottom line and has, ever since, begun to stir up again. Other waning sectors affecting Mexican workers have been tourism and entertainment as well as manufacturing with more than 100 000 and 150 000 fewer jobs between 2007 and 2011. These workers have found opportunities in sectors like services, education, health, agriculture, fishing, and forestry and information technology. Mexicans of second and third generation have lost their jobs in construction and found new chances in the mentioned sectors as well as entertainment and tourism. This phenomenon is not new; Hilary (et. al, March 2011: 21) states, for example, that the economic crisis in the USA from 70´s onward have particularly affected men, black and Hispanic workers. This is due to the fact that these groups are normally employed in highly cyclical industries such as construction and manufacturing. The already unusual 99 weeks long unemployment insurance benefit, represents an evidence that the US economy is facing a long-term unemployment problem.

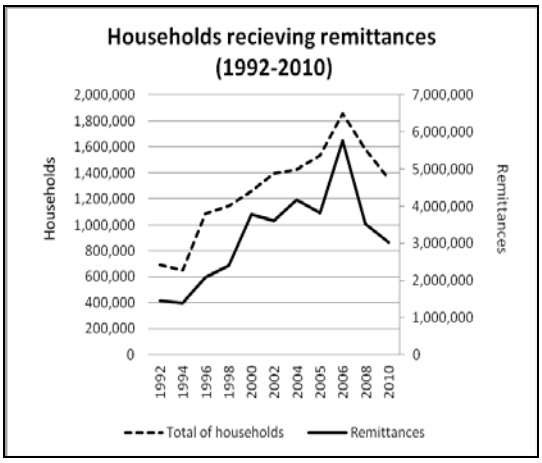
It is estimated that Mexican immigrants are concentrated in US States like California, Texas, Illinois, Arizona, North Carolina, Georgia, Florida, Washington New York, Colorado, Nevada, Oregon, New Mexico, Indiana and Tennessee. According to BBVA (junio de 2011), Mexican immigrants have left those US States where laws against illegal immigration have been issued. That is the case of the SB2040 in Florida approved on the May 3, 2011, by which authorities verify immigrant status of those who apply for public services or when detained by the local police because of a minor felony. If that person is illegal, he or she can be sent to the immigration office and be deported to her o his country of origin. This law was planned to be enforced on of July 1, 2011. In Indiana, the Congress approved the SB590 law on May 10 to be enforced by July 1, 2011, by which any person incurring a minor problem, even a traffic incident, can be arrested. Enterprises of this state working for the government will use an E-Verify system to monitor their associates and make sure they are not illegal immigrants. The governor of Georgia issued the HB87 law on May 13, which entitles the local police to check the migration status to anyone who breaks the state law, or punishes people who shelter or transport illegal immigrants. In Alabama a law was passed June 3 that allows the local police to stop any car or citizen suspicious to be an illegal immigrant; immigrant have therefore left Arizona, Florida and Georgia.

Graph 1



Source: BBVA (Junio de 2011).

Graph 2



Source: CONAPO (2012).

As we can see in graph 1, more than 140 000 immigrants left Florida, 70 000 Arizona and 40 000 Georgia between 2007 and 2010. Many have moved to neighboring States like New Mexico, Texas and North Carolina. Other States like Oklahoma are discussing laws like the HB14462 by which any passenger travelling in a public or private transportation could be stopped to be asked about his or her immigrant status. Besides the fact that employers would have to verify the immigrant status of his associates, the state of Oklahoma could be entitle to confiscate any assets belonging to an illegal immigrant like cars, houses, money, etc. The State of Tennessee was discussing the HB1380 law to be approved in 2012 by which anyone committing a crime or being suspected to be an illegal immigrant can be arrested.

This policy has begun to affect Mexican immigration. According to Passel (et al, 2012: 9), deportations of unauthorized Mexican immigrants – some of them picked up at work sites or after being convicted for other criminal violations – have risen to record levels. In 2010, 282 000 illegal Mexican immigrants were deported to Mexico. The same source affirms that the number of Mexicans trying to cross the border illegally dropped from 1 million in 2005 to 286 000 in 2011. Border Patrol apprehensions are now to the 1971 levels.

According to BBVA (Junio 2011), the growth of Mexican population in the US from 2002 to 2005 was fostered mainly by an increasing number of immigrants, while the second half of the 00´s the children of Mexicans born in the USA led that growth. Passel (et al, 2012: 9) states that from 2000 to 2010 births of Mexicans in US surpassed immigration as the main reason for growth in the Mexican-American population[85]. The BBVA (Junio 2011) report reveals that 55% are men and 45% women; the share of immigrants younger than 30 years old has diminished, whereas that between 30 and 64 years old has grown whereas the group over 64 has remained stable. The average age of immigrants grew by 3 years from 2000 to 2010 ending at 37 years old. The same source points out that Mexican immigration to the USA not only has diminished due to the economic crisis and the laws against illegal migration recently passed in the USA, but has unleashed a wave of Mexican returnees back home. It is estimated that from 2007 to 2011 the number of illegal Mexican immigrant has remained in 11.8 million. This information seems to coincide with Jeffrey Passel´s (et al, 2010: 11-15) report. He points out that the Mexican-born population grew 23% from 2000 to 2005, peaked in 2007 at 12.6 million and stabilized for two years before declining slightly in 2010. In 2011, the Mexican born population in the U.S. decreased still further, to 12.0 million; 58% of them are estimated to have an illegal status. Passel (et al, 2010: 17) estimates that 5% to 35% of 1.4 million Mexican adults who returned back to Mexico between 2005 and 2010 may have been forced to do so, either by deportation or expedited removal processes. An interview applied in 2010 showed that 20% of the repatriated Mexicans said they would never go back to the USA, while only 7% gave the same answer in 2005. He also writes, that the annual inflow of Mexican immigrants to the US went from 370 000 in 1991 to 770 000 in 2000, but from that year on that number started to decline sharply to only 150 000 in 2009 and even lower in 2010. He thinks that the return flow to Mexico might have exceeded the inflow from 2009 onwards.

The number of household receiving remittances went from 692,676 in 1992 to 1,858,758 in 2006, which equals a yearly average growth of 7.31%. Its share in the total Mexican households grew from 3.7% in 1992 to 4.7% in 2010, but it reached its highest participation in 2006 with 7%. That means, it dropped between 2006 and 2010 by -27%, going from 1.858 to 1.3 million or from 7% to 4.7%. This fall can be explained by a higher number of Mexicans losing their jobs as a consequence of the economic crisis. According to BBVA the rate of unemployment among Mexicans went from 5.5% in IIQ07 to 12.9% in IIQ09, while for the average American worker the same indicator was 4.5% and 10% respectively. Conversely, the amount of remittances grew at an annual rate of 15.32% going from 3 bn USD in 1992 to 26 bn USD 2006. The steepest increments were scored in 2003 and 2001 with 54% and 35.3% respectively and both were related with a US economic take off.

The BBVA (Junio 2011: 25-29) report shows that the primary receivers of remittances are households living in rural areas. The Federal State of Zacatecas scored the highest in terms of receiving remittances in 2010, with 11%, followed by Michoacán, Nayarit, Guanajuato and Guerrero. At the same time, Zacatecas showed the highest share of households (17%) benefiting from foreign

[85] Passel (et al, 2012: 35) states that Mexican born immigrants are younger, less educated and less likely to speak English very well in comparison with other foreign born residents of the USA.

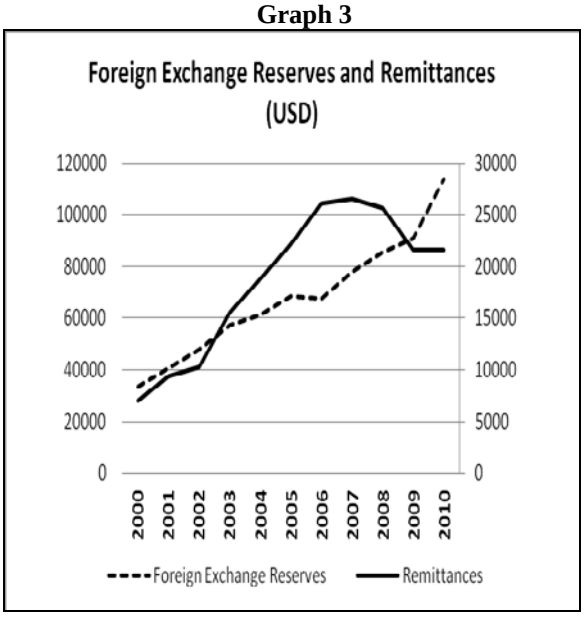
money transfers, followed by, Michoacán, Nayarit and Jalisco. This same report found that more than 50% of the households led by women and receiving remittances were in Tabasco (60%), Distrito Federal (52%), Tlaxcala (51.6%), Veracruz (50.9%) and Hidalgo (50.1%). The national average being 45.0%, Durango, Campeche und Baja California showed the lowest share: 36.3%, 36.4% and 37.5% respectively. The same report states that these households don´t belong to the poorest levels classified as *marginalized population*, but to the low-income tenths. As a matter of fact, by plotting the percentage of households receiving remittances against the marginalization level, we observe an upside down "U" shape, meaning that as income increases the majority of these households receiving remittances are located in the middle levels of marginalization. However, there are families for whom remittances are of the highest importance and therefore, become vulnerable to external shocks. CONAPO (2010: 48), for example, states that the share of households depending on remittances for more than 75% of their whole income reached 16.5% out of 1.1 million households registered in 1996. In 2006, when the number of families receiving remittances scored 1.9 million, this share was 13.8%. In 2008 the proportion fell to only 6.3%. This significant drop is attributed to the fact that most of the families who stopped receiving remittances were those depending on them for more than 75% of their income. Finally, it is important to emphasize that remittances make at least 50% of the whole rural households´ monetary income.

Changes in remittances´ purchasing power

Sources quoted at the beginning of this paper, posed the hypothesis that exchange rate depreciation had positive effects in purchasing power in terms of local currency and therefore, higher unemployment and a decline in remittances, were partly offset by a depreciation of the local currency, allowing the correspondent households to acquire more goods and services at the domestic market. According to the BBVA report (Marzo 1, 2012), Mexican remittances grew by 7.2% annually in January 2012, and twice as much in terms of pesos. The annual amount totaled 22.8 bn USD, which is 2.2 bn USD above the level reached before 2007 and 3.2 bn USD below its highest record in December 2007. This rebound is explained by the fact that more than 50% of the jobs lost during the crisis in the USA have been recovered and 20% of them have been covered by Mexican immigrants.

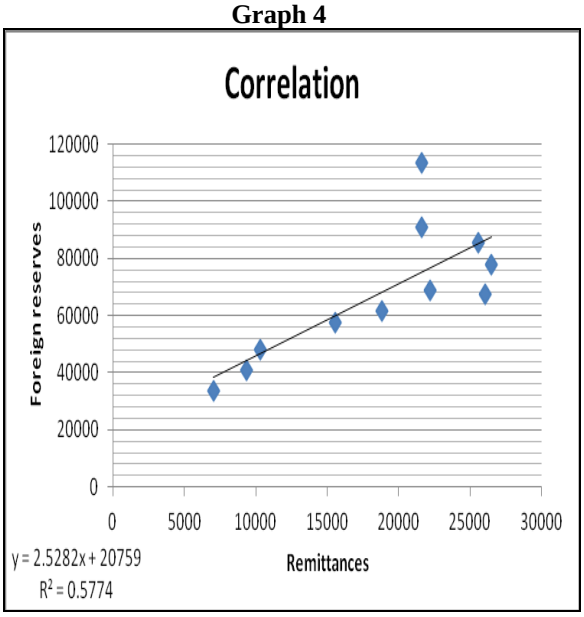
As we can see in the graphs 3 and 4, remittances have been growing along the 00´s, supporting the appreciation of the MXN through an increasing amount of foreign reserves. The Pearson correlation between foreign reserves and remittances equals 0.75 or a R^2 of 0.57, which means they are highly correlated. According to the equation in bottom left side of graph 4, for every billion USD increase in remittances, the foreign reserves of Mexican Central Bank are augmented by 2.5 billion USD. Conversely, the monthly amount of remittances in terms of MXN and the NER has a Pearson correlation of 0.87. A regression between the two variables states $y = 594.9 + 276.7x$, which means that for every unit that the MXN depreciates against the USD, the average nominal value of remittances increases by 276.7 MXN as plotted in graphs 5 and 6. It is also evident that the economic crisis, which triggered a depreciation of the MXN by almost 40% at the end of 2009, increased the monthly average amount of remittances in terms of local currency. That also occurred at the end of 2011, as we can see in graph 5. The 27% drop in the number of households receiving remittances between 2006 and 2010 was supposed to be counterbalanced by a more powerful dollar resulting from a depreciation of the NER. In order to see whether or not, these families obtained a better purchasing power, we must match that income with prices of products these families buy everyday. According to the Economist, (January 5th 2008: 11), 90% of remittances worldwide are spent on consumption. In Mexico, CONAPO (2010: 66) reports that more than 80% of remittances are used to buy food, pay rent or repair the house; only 6.5% are used to set up a business or to buy a property, and another 5% to pay debts.

Graph 3



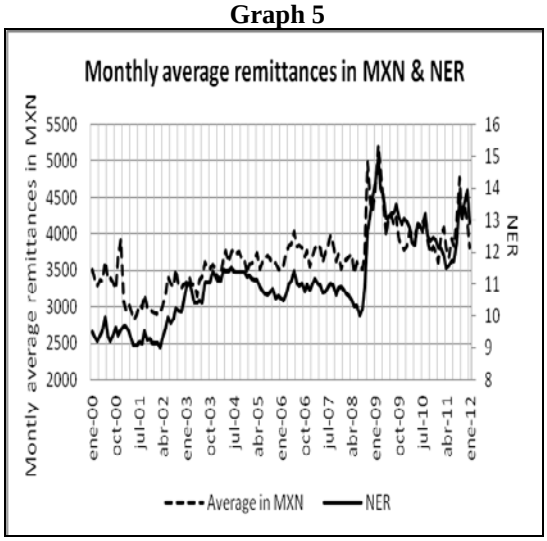
Source: Banxico (2011) Informe anual 2010.

Graph 4



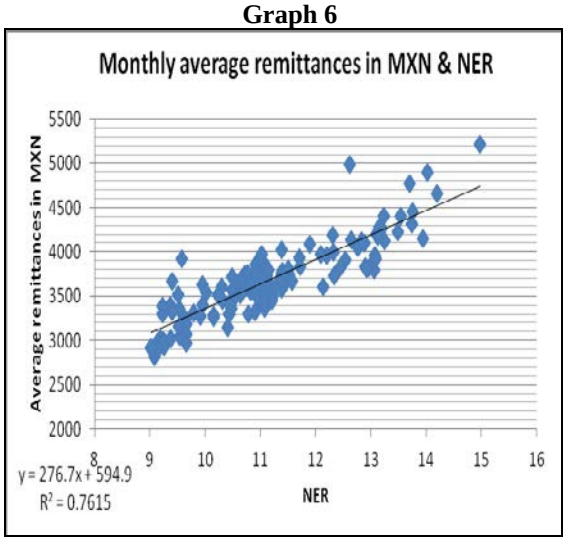
Source: Banxico (2011) Informe anual 2010.

Graph 5



Source: Banxico (2012) CE81 ingresos por remesas.

Graph 6



Source: Banxico (2012) CE81 ingresos por remesas.

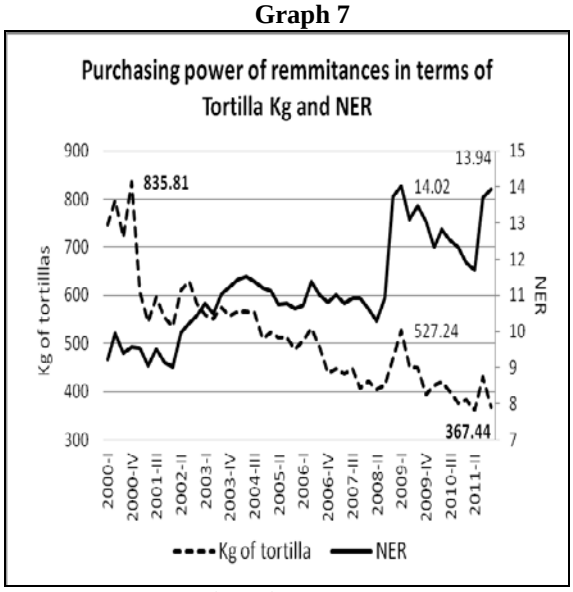
To conduct this analisis we have choosen two leading items of the Mexican basic consumption basket: energy (gasoline and Diesel) and Tortilla. According to the INEGI (julio de 2011: 15) households´ income is composed by 75% cash and 25% in kind. For instance, food, beverage and tobacco represent 33% of the monetary expenditure, whereas transportation represents 18.5%, making both together 50% of the expenditure. According to Irma Martinez (2003: 31), Tortilla appears in the first place among the 20 most important food products bought by an average Mexican family nation wide and it is essential to the poorest people´s diet. Eventhough both products, Tortilla and fuel, are heavily subsidized by the government[86], they still represent a strong driving force by which prices of a great variety of products in the food chain and transportation change. Mexican Central Bank (Banxico, 2011: 38) acknowledges a high rate of inflation in food, beverage and

[86] The total governmental expenditure to subsidize gasoline and Diesel from 2007 to 2011 was 530.23 bn MXN. In times where international oil prices are high, the subsidy increases, since more than 40% of the domestic consumption of gasoline must be imported. At the IQ12 the subsidy for gasoline and Diesel was 51.5 bn MXN, an amount that had already surpassed the whole budged for that year. So it is highly probable that energy domestic price increases continue in the future. The Secretary of Finance (SHCP) states that 50% of this subsidy benefits 20% of the population with high income, whereas only 4% on the population with low income take advantage of this governmental aid (El Financiero, 2 de mayo de 2012: 3).

tobacco. This soared to almost 10% annually at the beginning of 2008 and went below 4% at the end of 2009 but rebounded again to reach more than 7% in December 2011.

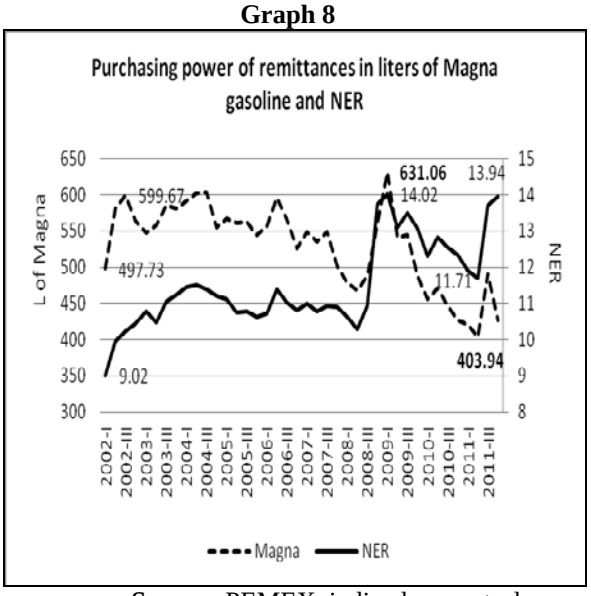
In 2008 and 2010 international prices of basic grains like wheat, rice and corn increased as a consequence of the food crisis. Prices of energy and precious metal soared as well; therefore, eventhough remittances increased in terms of MXN due to the depreciation, that did not mean the households could automatically acquire more goods and services. In order to gauge to what extend the depreciation of MXN meant a higher purchansing power for the respective households, we must match that income with price increases in Tortilla and gasoline. Based on the average monthly amount of dollars[87] sent by immigrants to their families in Mexico as plotted in graph 5, we can estimate the purchasing power in terms of food and energy. For instance, in graphs 7, 8, 9 and 10 we can see the behaviour of NER and the purchasing power of remittances in terms of Tortilla Kilograms (Kg), liters (L) of Magna gasoline, L of Premium gasoline and L of Diesel. In all items a depreciation of the NER seems to be reflected by substantial loss of purchasing power, except during 2008-9 when the crisis struck the hardest.

Graph 7



Source: Banxico (2012) CE81 ingresos por remesas.

Graph 8

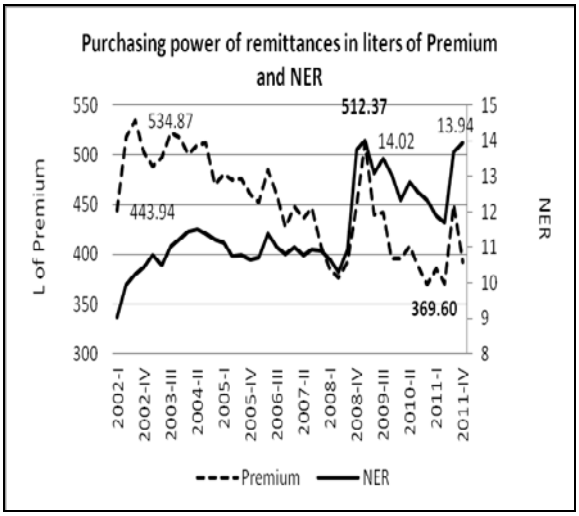


Source: PEMEX, indicadores petroleros.

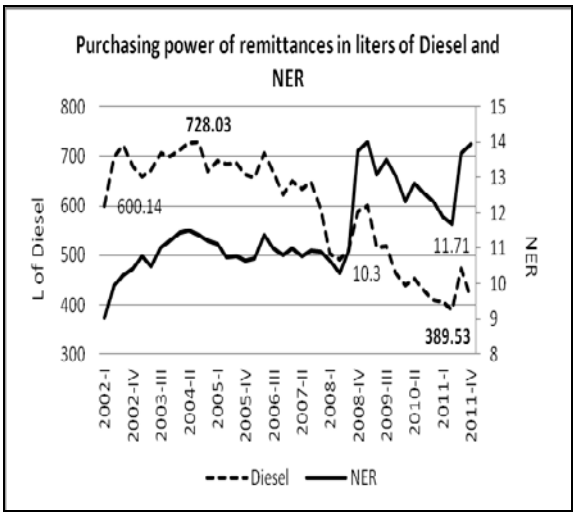
From IVQ00 to IVQ11 the average monthly amount of remittances declined by -27.28% going from 409.61 USD to 297.85. At the same time NER depreciated from 9.57 MXN per USD to 13.94 or by 45.66%. In terms of MXN this represented an increase of only 5.92%, going from 3920 MXN to 4152 MXN in the same period. However the price of a Kg of Tortilla rose from 4.60 MXN/Kg to 11.30 MXN/Kg or by 145%. Dividing the amount of remittances by Kilograms of Tortillas, we see a loss of 56% as shown on the left side of graph 11 since households could buy only 367.4 Kg of Tortillas in IVQ11 instead of 835.8 Kg as they did in IVQ00 (see also graph 7). By extrapolating values, we can say that households could buy 631 L of Magna gasoline in IQ09 when the average NER was 14 MXN per USD, but at the IIQ11 they could only afford to buy 404 L, a loss of 36% (graphs 8 and 11). For Premiun and Diesel, households could buy 512 L and 729 L in IQ09 and IIQ04, but 369.60 L and 389.53 L in IVQ10 and IIQ11 respectively, a loss of 27.8% and 46.5%. As shown in graph 11, the largest purchasing power loss these families had, was of Tortillas, followed by Diesel, Magna and Premium.

Graph 9 **Graph 10**

[87] The net amount is highly controvertible. But we use here data published by the Mexican Central Bank. CONAPO, (2010: 51-52), for example, states that the average annual remittances amounts 2000.00 USD per family in the rural sector and 2400.00 USD in the non rural sector. The same source specifies that the yearly amount of remittances in rural sector increased from 496 million USD in 1992 to 1,350 million USD in 2008, whereas non rural sector went from 968 million USD to 2,176 million USD in the same period. In year 2006, both sectors reached their highest level with 2,705 and 3,058 million USD respectively. Finally, additional cuts resulting from commission charged by businesses like Western Unions must be considered as well.



Source: PEMEX, indicadores petroleros.

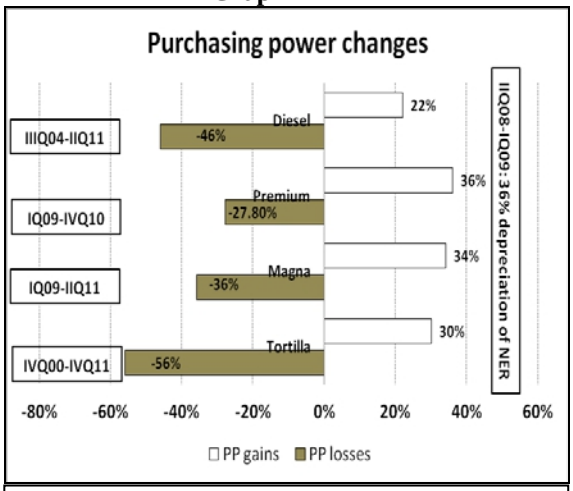


Source: PEMEX, indicadores petroleros.

Table 1

Correlation NER vs Tortilla and fuel			
Item Time span	Slope	Pearson C.	R^2
Tortilla 00-11	y = -47.941x + 1048.1	-0.60	0.35
Magna 02-11	y = -11.07x + 657.87	-0.22	0.05
Premium 02-11	y = -10.866x + 575.84	-0.26	0.07
Diesel 02-11	y = -50.238x + 1172.4	-0.54	0.29
Source: Own calculations with data of PEMEX			

Graph 11



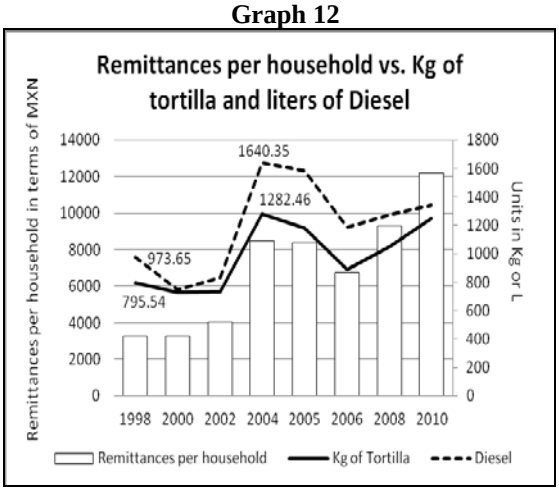
Source: Own calculations with data of PEMEX.

The items we have chosen are inversely correlated with the NER. That means that as the nominal exchange rate depreciates, purchasing power diminishes. Table 1 shows that Tortilla has the highest correlation with -0.60, followed by Diesel: -0.54; Premium:-0.26 and Magna -0.22 with their respective R^2 :0.35, 0.3, 0.070 and 0.052. Supossing all money from remittances are used to buy these items separately, we can say that for every unit the MXN depreciates, households lost purchasing power in terms of 48 Kg of Tortillas , 50 L of Diesel, 10.8 L and 11 L of Magna. This means that the largest price increases have taken place in Tortilla and Diesel. Apart from Tortilla, beans, white bread, chicken, tomato, sugar, milk and vegetable oil scored the highest price hikes between 2006 and 2011, affecting the purchasing power of the lowest levels of income. Diesel is used by a broad number of economic actors under which logistics and trucks have been most affected.

On the other hand, graph 11 shows on its right side how a 36% depreciation of NER between IIQ08 and IQ09 allowed families to improve their purchasing power by 36% in Premium; 34% Magna, 30% Tortilla and 22% Diesel. But this windfall could not offset the losses accumulated between the highest and lowest purchasing power levels pointed out on the left side of the same graph, except for Premium with a net gain of 8.2%. This effect was the result of the fact that prices rose more rapidly than the purchasing power of the MXN derived from the NER long term depreciation, except for the period between IIQ08 and IQ09, when a severe depreciation came so unexpectedly that domestic prices could not catch up.

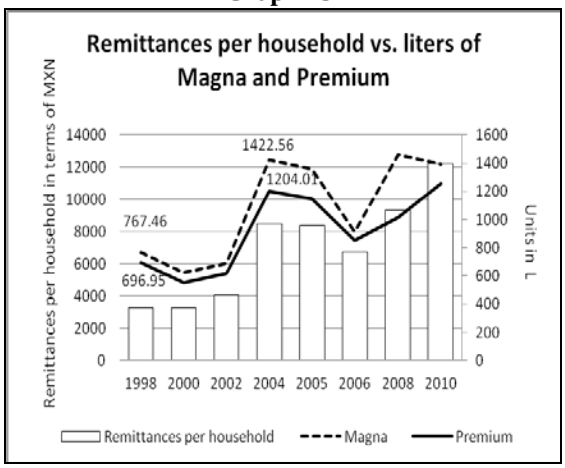
There is still an aspect that could change the view of this analysis substantially. As we stated before, the number of households receiving remittances dropped by 27% going from 1.85 million in 2006 to 1.35 million in 2010, while remittances on a yearly basis also fell, but only by 16% from 25.5 bn USD to 21.3 bn USD in the same period. If we divide the amount of remittances by the smaller number of households, we come up with a higher amount of income per head. Graphs 12 and 13 show how a fewer number of households receiving a higher amount of remittances in terms of MXN due to the depreciation were able to buy more units of tortillas and fuel. Especially in the case of tortilla and diesel, where the aforementioned analysis showed a substantial loss, there is a clear betterment of the purchasing power from 2006 onwards. The recovery is stronger by Magna and Premium as graph 13 shows. Calculating the monthly amount of remittances from this angle we come to a quiet different result. For instance, the average monthly amount[88] rose from 408 USD (3,718.35 MXN) in 1998 to 1322 USD (14,736.85 MXN) in 2008 and to 1308 USD (16,494 MXN) in 2010, which is a lot more than the statistics that the Mexican Central Bank and INEGI report. This is an open question that has still to be addressed since it might have to do with high levels of inequality or the participation of organized crime, both factors capable explaining why monthly remittances could be that high.

Graph 12



Source: Banxico and INEGI.

Graph 13



Source: Banxico and INEGI.

Effects of remittances on employment and education

If households receiving remittances had a real net loss either by a smaller amount of remittances; by an interruption of any help from abroad or by a deterioration of their purchasing power as the above analysis shows, they must have looked for alternatives to redeem these losses. According to CONAPO (2012: 45-47), the share of remittances in the total monetary income of the correspondent households soared from 44% in 1992 to 53% in 1996. The following years it dropped going from 40% to 48%, except in 2008 where it reached 27% due to the economic slump. But households seemed to have found ways to counterbalance variations in the flow of remittances. For example, the share of remittances in comparison with other sources of income (e.g. non monetary income; own business, and salaries) was 40% in 1996; 33.6%: 2006: and 21.2%: 2008, while the share of job retributions and revenues from their own business in the total income was 18.3%, 25.2%: 1996; 29.5%, 9.8%: 2006 and 9.9%; 11.9% in 2008. This effect was even larger in the rural sector. That means that family members started to work or set up a business as they saw the flow of remittances languish. However, we must notice that none of them could fully substitute the importance that remittances had in 1996. Since some households could have stopped receiving remittances completly, we can observe a general deterioration of their standard of living.

In this same context, a research conducted by BBVA (junio 2011:17-24) using the *logit* and *probit* models find a relationship between remittances and employment as well as remittances and school attendance. The results point out that the probability of a household finding a job reduces by between 7 and 8 percent if it gets money from abroad. This was observed in both genders, either male or female, running a household, but more intensively by those in which the responsible was a male.

[88] Remittances in 2008 amounted 25.134 bn USD; households were 1.58 million, which means that every household received an average of 15 874 USD or an equivalent of 1322.88 USD monthly.

The same report states that between 2007-2010, the number of women belonging to these householdes and started to work, increased by 3%. CONAPO (2010: 59) states that the number of families led by women increased constantly along the 00s, and in 2006 there were almost 964 000; two years later and as a consequence of the economic crisis, this number was reduced to 738 000, which suggests that the most affected households were thouse led by women. On the other hand, BBVA (junio 2011:17-24) states that municipalities with high rates of remittances reception show at the same time, high levels of unemployment. Two hypotheses attempt to explain the phenomenon; on the one hand, people receiving remittances are less motivated to work, making it easier for the rest to find a job and therefore showing sinking levels of unemployment; on the other hand, the smaller the number of people working, the less is produced and the less the labor force is required.

In respect to the effect of remittances in school attendance, the same report found a positive relationship between remittances and school attendance among children below 15 years old and youths between 15 and 19 years old. Other estimates coincide with the results leading to the conclusion that remittances have fostered the formation of human capital, which at the same time constitutes a significant contribution to long-term development (Sachs, J.: 2005). However, an other important finding was that middle levels of education seem to foster immigration more intensively than higher ones. Thus, the report concludes that education and reception of remittances have a positive correlation. That means that remittances allow and animate households to send children to school, opening them up a chance to immigrate when they reach the middle levels of education. That will assure, at the same time, the future reception of money from abroad. Recent data have shown that immigrants older than 15 living in the United States have an average of 9 years of school attendance. If this effect supersedes the former, the long term human capital formation in Mexico that remittances seem to foster could be counterbalanced through a brain drain process. However, this seems to be a world tendency; according to The Economist (5th June, 2008: 5), the Word Bank found that 32% of 52 million immigrants in 2000, had a college education, a share which represented a sharp rise in comparison to a decade earlier.

Conclusion

On April 25th 2012, the Mexican President Felipe Calderon Hinojosa, stated in a G-20 Summit in Washington, that Mexican immigration to the USA had come to a halt in net terms, due to the fact that employment opportunities and health services in Mexico had substantially improved. That might be the case of Brazil, since our paper doe not seem to support the President´s declarations. The present analysis shows that immigration has indeed diminished through two mechanisms, by the drop in the annual number of people leaving for the US and by an increasing the number of Mexican returnees. However, this drop is the consequence of the recent anti-imimmigrant laws and the Great Recession in the USA. Of course, other factors like the decline in Mexico´s birth rates and a slight economic improvement in some regions might have also played a role. But in general, the unemployment rate in Mexico has remained above 5% annually since the Great Recession broke up in 2009; a level that is still very high when compared in length with the 1995 recession. If we take into account that 28.8% of the working population is employed in the informal sector, and more than 7 million young people neither work nor study, it is hard to support the hypothesis that better labour conditions have stopped immigration in the last years. Immigration has diminished, but it is still an important alternative for many Mexicans to improve their income and help their families. It depends more on the USA economic performance than the dynamic of the domestic labour market.

Remittances and immigration will eventually rebound as the US economy starts to overcome its present structural crisis. Remittances alone cannot be by themselves the main development factor, but they have proved to be until now a powerful driving force to deter or reduce poverty in Mexico. CONAPO (2011: 64) for example, points out that a 30% drop in remittances would condemn 30 000 Mexican households to poverty. Those families for which remittances do not represent the main source of income normally strengthen their economic status by acquiring tangible assets like property and business. The present essay posed the hypothesis that NER depreciation translated to an increase in purchasing power in terms of local currency, which at the same time meant an improvement for families receiving USD from abroad. As we saw based on domestic price changes of Tortilla and fuel, the additional nominal income derived from such depreciation was offset by a larger domestic price increase, so that at the end, households became poorer. An additional factor which might have worsened the familie´s income was that remittances lowered in average and that several household

stopped receiving them all together. An exception took place during 2008-9, where NER depreciation allowed families still benefiting from remittances to buy more units of Tortillas and fuel, as prices could not adjust so rapidly.

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