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# When the Tigers roar, what's labor market's answer? Conflict migration and social networks in Sri Lanka

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## Abstract

The civil war between the separatists Tamil Tigers and the Government has been plaguing Sri Lanka since 1983. It has caused death and destruction, and has affected society and economy. In my work I try to assess the effect of the conflict on labour markets at the micro level. The conflict influences labour market through the functioning of informal institutions, namely migrants' networks. By affecting internal migration, the civil war indirectly determines the size of migrants' networks, and the networks provide information and referrals and help migrants in finding a job. I use the variation in migration caused by the war to solve the endogeneity of the network in the employment equation by adopting an instrumental variable approach. In this way, I can test whether the networks enhance labour market outcomes for their members. I analyze data from the Labour Force Survey quarterly held in Sri Lanka from 1996 until 1998 and I present data on the conflict that I collected from news agencies. The results of my empirical analysis suggest that the conflict has a significant, negative effect on migration. I find that the migrant's probability of being employed is enhanced when his network is larger, by using conflict intensity in the province of origin as an instrument for the size of the network at the destination.

## 1. Introduction

The economic consequences of civil wars have recently become an issue in development economics, as ethnic conflicts continuously plague developing countries all over the world. Chechnya, Colombia, Sri Lanka and Sudan, for example, have been war-torn for years, most often in a cone of silence. The effects of a conflict on a country are clearly awful. Death, destruction of human and physical capital, and political instability are the most obvious (and studied) costs of war. It is straightforward that high military expenses crowd out investment and GDP growth, while battles and bombing destroy capital accumulation and infrastructures<sup>1</sup>.

Wars impose several restraints to human rights. During conflicts, the right to life, liberty and security of person is endangered, and individuals are no more protected by arbitrary arrest, detention or torture. Among others, the right to freedom of movement and residence is often disregarded during wars<sup>2</sup>. Conflicts can affect an individual's freedom of movement and residence by forcing him to leave the place where he is living, or, on the contrary, by preventing him from migrating. In my work I want to analyze how conflicts affect the mobility of the individuals, and how this indirectly influences labor markets at the micro level.

I focused my research on the case of Sri Lanka, where more than 64,000 lives were lost during 23 years of conflict between the Liberation Tigers of Tamil Eelam (LTTE), and the Government of Sri Lanka. The case of Sri Lanka is emblematic of a conflict that seems to never end. The war broke out in 1983 and lasted continuously until the February of 2002, when the government and the LTTE declared a ceasefire. Actually the situation was very fragile and although the agreement meant an end to large-scale militarized conflict, there have been high levels of political violence, including

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<sup>1</sup> Nevertheless, at micro level the effects of conflicts on firms' performance are ambiguous. While Abadie and Gardeazabal (2003) found a negative relationship between firms' conduct in the Basque region and the ongoing of the conflict between Spanish government and ETA separatists, La Ferrara and Guidolin (2005) showed that some industries thrive on war, and it is not only the case of defence and arm industry. Also the effect of conflicts on institutions is not clear at micro level. By analysing the aftermaths of recent civil war in Sierra Leone, Miguel (2005) found that local violence was associated with greater local mobilization and collective action postwar; thus, the conflict seems to have produced a heightened political awareness.

<sup>2</sup> Article 13 of the Universal Declaration of Human Rights states that:

- 1) Everyone has the right to freedom of movement and residence within the borders of each state.
- 2) Everyone has the right to leave any country, including his own, and to return to his country.

over 3,000 ceasefire violations. This period of "no war no peace" ended in April 2006, when the conflict began once again.

Violent conflict has had enormous costs in terms of physical, financial, human and social capital. Apart from the direct impact on human lives and suffering, it has cost approximately 5% of GDP per year. It has also undermined the development gains of previous decades and had a corrosive effect on institutions of governance. During the conflict, mobility within the country was severely constrained. Northern and Eastern provinces were completely controlled by LTTE and it is very hard for civilians to cross the borders and flee to Government controlled areas. High amounts of money were necessary to corrupt both the rebels and security forces at checkpoints, when the prospective migrants were not granted the essential permits. Not only the rebels, but also Sri Lankan Army and security forces tried to hinder migration from the areas controlled by LTTE, as the panic spread out all over the country because of many suicide attacks.

In my work I analyse the dynamics of labour market outcomes for persons who migrated within Sri Lanka. In particular, I analyse network effects among migrants and I test whether they improve labour market outcomes for their members. I expect the conflict to be strongly correlated with migration, so I use this statistical relation to solve the problem of endogeneity of the network in the employment regression.

Many studies in economics addressed the issue of migrants networks and their impact on labour market. Usually these works analysed networks among migrants who migrated in the U.S. or in Europe from poorer countries<sup>3</sup> and their effects on U.S. or European labour markets.

My analysis is different for two aspects. First of all I analyse network effects among individuals who migrated within the same country. Although fundamental cultural differences can occur between different regions in the same countries, some problems that typically affect international migrants, as for example language difficulties and illegal status/ clandestine/ residence permits, do not occur for internal migrants. By the way, the most innovative contribute of my work is that I assess the consequences of civil conflicts on a country by measuring their effect on some informal institutions that affect labour market. The effect of the war on migration

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<sup>3</sup> Some studies also explored networks among refugees in the U.S.(see Borjas, Beaman).



affects labour market outcomes through the functioning of social network. I find that the network improves labour market outcomes among its members. I also find that the conflict in the province of birth of the migrant is significantly correlated with the size of his/her network, and that the sign of this correlation is negative.

My work is organized as follows: in section two I shortly review literature on networks. In Section three I briefly describe the conflict and the data. In Section four I explain my identification strategy and in section five I discuss the empirical results. In section six I draw conclusions.

## **2. Literature review**

My work is closely related to the strand of literature that analyses the effects of social networks in labour markets.

The studies on network effects are connected to the renewed interest of economists towards the role of non market institutions as devices able to provide solutions to information, enforcement and coordination problems. Networks have an important role not only in labour market, but also in credit market and in welfare participation.

Fafchamps widely assessed the importance of networks and relationships in credit markets in developing countries. According to his work, search and screening costs are much higher than in developed economies, and the potential for opportunistic behaviour is higher. Consequently, market participants tend to operate in a highly inefficient way. Increased efficiency can be reached by emphasizing long term relationships with other agents, through networks and relationships.

As highlighted by Borjas (1992), it is natural to expect network effects to be stronger in migrant communities, because they tend to be more socially cohesive than native communities. Network effects can provide an explanation to ethnic clustering for migrants. The existence of beneficial network externalities influences the location decision of prospective migrants, because networks provide information about the host region labour market and help in the settlement process. Many studies

addressed the role of networks among migrant communities, and their effect on labour market and welfare assimilation.

Most of these works analysed the U.S. and European labour markets, where migrants usually come from developing countries and have lower educational attainments than native population on the average. In my work I analyse network effects among migrants who migrated within the same country, and have characteristics similar to the native population.

In labour markets, networks can be very effective in overcoming information problems. Their role was first analysed by Montgomery (1991). By developing an adverse selection model, which explicitly incorporates a simple social structure, he shows that the use of employed referrals is beneficial both for workers and firms, because it helps to overcome the problem of imperfect information about an unemployed individual's ability. For an unemployed person, thus, it could be easier to find a job if he has a network of friends and/or relatives with good connections in the job market. This is especially true for migrants because, since they are newcomers in the labour market, they are more susceptible to information problems.

The research of Munshi (2003) on Mexican migrants in the U.S. has been particularly valuable for my research. Munshi analyzes network effects among Mexican migrants in the U.S. labour market by using individual panel data from a small number of Mexican communities. The communities are set in a region that traditionally supplied a large share of migrants to U.S. His specific objective is to test whether the network improved labour market outcomes for its members. He constructs a simple model following the one created by Montgomery and then tries to test network effects through a linear probability model. The outcome of interest of the regression is the migrant's employment status in the U.S. and the explanatory variable is the number of people from his origin community that were established in the U.S. Migration from this region tends to be recurrent: individuals move back and forth between Mexico and the United States, and only a small fraction settles permanently abroad. If the individual's network at the destination consists of other migrants from his origin-community, then both the size and the vintage of the network would be changing over time. Munshi uses this variation within the community over time rather than across communities to estimate the network effects in this paper. Using variation

within each origin-community's network over time to identify network effects has two major advantages. First, the network at the destination is drawn from a well-defined and well-established social unit: the origin-community. The second advantage of his estimation strategy is that the econometrician is in a position to control for both selectivity in the migration decision, as well as for the endogeneity of the network itself, in the employment regression. The individual migrant's network is measured by the proportion of sampled individuals in his community who are located at the destination (the United States), at each point in time. The basic specification of the regression equation includes the size of the network, the individual's unobserved ability, and unobserved labor market shocks, as determinants of the migrant's labor outcome in the United States.

If migration is based on both the individual's ability as well as the size of the network at the destination, then changes in the size of the network will be associated with compositional change in the pool of migrants, biasing the estimated network effects. Since he has panel data, this selection bias can be corrected by including individual fixed effects in the employment regression, under the assumption that individual ability does not vary over time.

Endogeneity rises from correlation between the size of the network and an unobserved exogenous shocks to labour market at destination. Munshi solves the endogeneity problem due to correlation with external shocks by adopting an instrumental variable approach. He needs a statistical instrument that determines changes in the size of the network but is uncorrelated with market shocks in the U.S. The ideal candidate is a variable representing lagged rainfalls in the origin community of the migrant. He finds a strong negative correlation between lagged rainfall at the origin and the size of the network of migrants in the United States. Besides, the origin community and the destination were far enough to assume that rainfall at the origin could not be correlated with labour market at destination. Hence he ran an instrumental variable regression, using as outcome of interest at first the employment status of the migrant, and then his occupation. He found that the Network significantly improves labour market outcomes among its members: not only it finds job for its members, it also channels them into higher paying occupations.

In building my empirical strategy I followed Munshi's path and I adopted a two stages least squares approach. I use exogenous variation in migration caused by the conflict in the province of origin of the migrants to instrument for the size of the networks at destination. I expect the severity of violence to affect migration and thus the numerical strength of migrants' network. I analyse network effects among internal migrants in Sri Lanka using data coming from Labour Force Surveys, which are held quarterly in Sri Lanka by the Department of Census and Statistics<sup>4</sup>. I collected myself data related to the ongoing conflict in the period of interest using several media sources (see below for a detailed description).

### **3. The Institutional Setting and The Data**

#### **3.1 The conflict and the society**

##### **3.1.1 Historical review of the conflict**

Sri Lanka has traditionally been a multiethnic country. The Sinhala or Sinhalese (74%) constitute the major ethnic group; the Sri Lankan Tamils, who inhabit the north and east, form the 12.6% of the population and the group known as Indian Tamils (19th century migrants for work on plantations) account for 5.6% of the population. While Muslims constitute the third largest ethnic group (7.4%), there are also small minorities such as Burghers (people of mixed decent), and Malays. Each ethnic group has a distinct identity with strongly held myths of origin; the Sinhala are the descendants of Aryans migrants from Bengal, the Tamils claim pure Dravidian origin, and the Muslims aspire to descend from Arabs.

Sinhalese and Tamil communities largely have distinct religious affiliations - the Sinhalese are predominantly Buddhist, the Tamils mainly Hindu (with a small Christian minority) - but the confrontation is based largely on ethno-political rather than religious differences.

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<sup>4</sup> The Department of Census and Statistics (DCS) is the central statistical agency in Sri Lanka. It is responsible for collection, compilation, analysis and dissemination of all statistical data needed for planning, policy formulation. It is also with the function of monitoring the progress of various development activities and measuring the impact of various governmental policies.

Sinhalese and Tamils have inhabited Sri Lanka since ancient times and lived largely in harmony, with ethnic differences probably less important than a strong caste system and colonial dynamics, first with the Portuguese, then with the Dutch and finally the British. According to historians, the British colonial system contributed to the ethnic tensions that emerged after independence. The British favoured Tamils in the colonial bureaucracy, and their predominant position became a source of discontent among Sinhalese. After independence in 1948, however, it did not take long for ethnic and social tensions to overwhelm the barriers of parliamentary democracy. Democratic elections inevitably produced governments that tended to favour the Sinhalese majority. The first major discriminatory legislation came in 1956, when the SLFP replaced English as the official language with Sinhala, effectively excluding minorities. The 1972 Constitution further exacerbated the situation, changing the name of the country from Ceylon to Sri Lanka and assigning Buddhism "The foremost place" in the state. This was followed by attempts to roll back the dominant position of Tamils in state employment and education that produced a generation of Tamil educated youth with few job options. Tensions led to the emergence of small, militant ethnic nationalist groups in the Tamil cultural capital of Jaffna in the early 1970. Both the Tamil political parties and the militants began to put forward radical demands for a separate Tamil state but more as a bargaining position than a serious proposition. The refusal to take Tamil demands for autonomy seriously led to a deepening of the crisis and a move away from constitutional politics to violent militancy. Ethnic tensions reached a peak in the early 1980s, as sporadic clashes broke out between Tamil militant groups and the security forces. In the worst of these, in July 1983, Tamil militants murdered thirteen policemen in Jaffna. In response, Sinhalese mobs burned Tamil homes in Colombo and murdered around 1000 Tamils. This pogrom was a great shock to the country but Sinhalese-dominated governments did very little to resolve growing crisis. Instead, the clashes of the early 1980s developed quickly into a major conflict. Militant Tamil groups, which had been fairly marginal until 1983, quickly gained new recruits. They also benefited from training, weapons and money from India, whose involvement on the side of the Tamils was partly prompted by geopolitical concerns but also closely linked to domestic politics: its own 60-million strong Tamil population in Tamil Nadu

had considerable sympathy for the Sri Lankan Tamil cause. Gradually one group, the LTTE, emerged from among the Tamil militants as the predominant force, led by a young militant, Vellupillai Prabhakaran, who came to prominence through a series of daring attacks on security forces and government officials. As the conflict spiralled out of control in 1987, with the armed forces pitted against the LTTE, India intervened by despatching a military force (Indian Peace Keeping Force, IPKF) to the North East of the island and forced the government to accept constitutional amendments that promised a degree of authority for the Tamils. The intervention was a disaster, and IPKF left the country in disarray in 1989. LTTE launched an orgy of violence against the security forces, massacring hundreds of policemen in the east, bombing political leaders in the south and killing rival Tamil leaders in both Sri Lanka and India. Soon it had taken control of most of the Jaffna peninsula as well as large tracts of territory in the north and east. The government response to militancy involved mass human rights abuses, killings and "disappearances" and undermined much of the democratic nature of the state. During this period LTTE gained its reputation as one of the world's most ruthless terrorist groups, thanks to the use of suicide bombers and spread child soldiers recruitment. With the election of the charismatic Chandrika Kumaratunga as president in 1994, there was renewed hope for a resettlement. Talks began with LTTE but soon broke down. The "pro peace" policy of the President soon shifted to a "war for peace" policy, in which military action was meant to dislodge the Tigers, while a political solution was offered to the Tamil people. Most civilians in the north east only experienced the military aspects of the policy, and Kumaratunga's devolution proposals were overshadowed by the ongoing fighting. Although the military scored some quick victories, notably retaking Jaffna in December 1995, it soon got bogged down as LTTE returned to its guerrilla tactics. The Government reverted to media censorship to cover up military reversals and atrocities committed by the security forces against Tamils. Devolution proposals were stuck in Parliament, with the Sinhalese opposition unable to rise above party politics to support them. The LTTE also increased the frequency and intensity of its terrorist campaign in Colombo and the south. Hundreds died from a bomb explosion at the Central Bank in the capital in January 1996. In February 1998 the rebels bombed the centre of Sri Lankan Buddhism, the Temple of the tooth in Kandy, and

followed up in July 1999 by murdering Neelan Tiruchelvam, a Tamil member of parliament who supported a moderate devolution proposal. Finally the LTTE attacked President Kumaratunga herself: she escaped with serious wounds, while 23 others died. The attack increased public support for her, just ahead of presidential elections in December 1999, and she scored a narrow victory marred by allegations of fraud. In 1999 the LTTE also struck back in conventional combat, overrunning military bases in the north. In April 2000 it seized the most fortified army base in the country and regained control of the strategic Elephant Pass (that links the country to Jaffna peninsula); as many as 1000 government soldiers died in the fighting. The final indignity of the defence establishment came in July 2001, when, in its most audacious attack to date, an LTTE unit took over Katanayake airport near Colombo, the country's only international airport, and destroyed half the air fleet.

At that time the economy was in crisis, with a drop in GDP in 2001 of 1.5 per cent and the constant drain of military expenditure undermining financial stability. There was widespread war weariness in the country, and both sides were ready for a new approach. The LTTE wanted time to regroup and try to gain some political recognition; the Government wanted a breathing space in which to reinvigorate the economy. The result was a ceasefire agreement signed on 22 February 2002 that led to the longest period of peace since the 1980s, which lasted until April 2006.

### **3.1.2 Poverty in Sri Lanka and the effect of conflict on development.**

Approximately 21% of Sri Lanka's population live in poverty. However, the depth and geographical spread of poverty in Sri Lanka has been disputed. The 1995 World Bank report, for example, argued that there had been a significant decline in poverty between 1985-93, whereas other commentators paint quite a different picture of rural misery. However, most agree that there has been a real widening of regional income disparities. There has been a pronounced metropolitan bias in local investment, employment and incomes. The Western Province, in particular Colombo, has been the main beneficiary of growth, while in the south development has stood still. In the north east there has been a marked decline. The conflict has reversed

development processes in the north and east provinces and acted as a brake on development throughout the island. Therefore, the conflict has had a major impact on poverty, which aid donors with a poverty focus increasingly recognize. Debt servicing and the conflict absorb about 50% of budget outlays. Some of the human development gains of earlier decades are being undermined. The quality and efficiency of health care, for instance, has declined, the incidence of malaria has increased and there has been a slight worsening in the rate of malnutrition in children under the age of five years. The government has been suffering from a growing credibility gap related to its failure to tackle corruption, to end the war, to dynamise the economy and to ensure a fairer distribution of gains between rich and poor. Owing to the conflict, Sri Lanka has been unable to attract significant foreign direct investment and the current portfolio of investments is negligible. In addition, black economies have developed around the conflict. In the border areas and in the conflict regions, paramilitary groups have developed various systems of taxation of traders and civilians through control of the main transport routes (and the movement of persons and goods), and through an economy of terror, scarcity and fear. In the east, the Razeeq group – a Tamil militant group who are loosely controlled and paid by the Sri Lankan army – control the fish trade and in Vavuniya in the north, the PLOTE have a monopoly on the fish and coconut industry. Armed groups control major transport routes and have created new security structures and protection rackets. Therefore, conflict has created new opportunities for profiteering and one could argue that, increasingly, the driving force for the conflict has shifted from grievance to greed. Evidently it is more complicated than this, but one should not discount the economic motivations for continued violence.

### **3.1.3 Security dimension of conflict**

As far as it regards the security dimension of the conflict, Sri Lanka has become a highly militarised society. The use of terror and show killings is widespread. Increasingly violence has become normalised and routinised, not only in the north east but in rest of the country, where election violence and violent crime



(often from army deserters) have become endemic. In one-third of the island, it is the military that make key decisions. Since the breakdown of the 1995 peace talks, there has been an increase in the political weight of those who control the means of violence, including the LTTE, the security forces and politicians with connections to thugs and paramilitaries. The Sri Lankan conflict has been called a 'no mercy' war as out of 10 estimated casualties on the battlefield, only one survives as wounded – being killed by their own side of the enemy – compared to the accepted average of 7.16.

### **3.1.4 Social dimension of conflict**

As argued above, the label 'ethnic conflict' is misleading as it implies that ethnicity is the primary cause of the Sri Lankan conflict. The conflict is both a cause and a consequence of the 'ethnicisation' of social, political and economic life. While a political economy perspective points to the primacy of 'interests', rather than 'passions' in complex political emergencies, one should not ignore the importance of the 'emotional economy' of violence. The Sri Lankan conflict, for instance, cannot be understood without referring to the 'double minority complex': both Sinhalese and Tamil's perceive themselves to be minority populations under threat – the former in relation to the Tamil population in south India and the later in relation to the Sinhalese majority in Sri Lanka. This sense of being an embattled minority has fuelled competing Sinhala and Tamil nationalism, which have become entwined with religious and cultural discourses. Both draw on a mythical history, which emphasizes ancient enmities between Sinhala and Tamil kingdoms, in spite of the evidence of a long history of ethnic accommodation. The importance of history and symbolism is demonstrated by the LTTE bombing of the Temple of the Tooth in Kandy in 1998, which hit at the heart of Sinhala Buddhist identity and pride. As positions have become more polarised, counter-discourses, which emphasise accommodation and a common past, are increasingly squeezed out. Although the education system may have the potential to reduce conflict and build social harmony, in its current form it reinforces ethnic and language differences.

## **3.2 The Labour Force Survey**

### **3.2.1 The design of the survey and the questionnaire**

I analyse the data of the Labour Force Survey produced by the Department of Census and Statistics of Sri Lanka. This survey covers the whole island except for the Northern and Eastern provinces, that are the two most severely affected by the armed conflict<sup>5</sup>. It is conducted through a scientifically selected sample designed to represent the civilian non-institutional population. Respondents are interviewed to obtain information about the employment status etc. of each member of the household 10 years of age and older. The Labour Force Survey covers a total of 4,000 households per quarter. These households are selected based on a two-stage stratified sampling procedure with no rotation. A new random sample is therefore drawn each quarter.

The Labour Force Survey questionnaire is designed according to internationally accepted practices. Labour force is composed of the economically active population of 10 years of age and over. An individual is defined as economically active if he/she was employed or unemployed during the reference period of the survey. Persons available and/or looking for work, and who did not work, during the reference period are said to be unemployed. On the contrary, a person is defined as employed if, during the reference period, he/she worked as paid employee, employer, own account worker (self employed), or unpaid family worker. The definition includes persons with a job but not at work during the reference period. In the survey there are two reference period, "current" and "usual". The "current" reference period is the week preceding the week of the survey, i.e. last week. The "usual" reference period is the last 12 months. I used only the latter reference period, so I define as employed a person that is "usually" employed according to the questionnaire. I made this choice because there were too many missing values to define also the "currently" employment status, otherwise it would have been interesting to use both definitions in the analysis. Finally, persons who were neither working nor available/looking for work are classified as "not in the labour force".

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<sup>5</sup> The territory of Sri Lanka is divided into twenty-five districts, which are grouped into nine provinces.

### 3.2.2 Description of the sample

I constructed my database by appending data from eight surveys, from the second quarter of year 1997 until the first quarter of year 1999. Each individual was interviewed only once in his life, so I have a database made up of individuals interviewed at different points in time. Among the population I selected a sub-sample of migrants.

To better identify the network variable I defined a migrant as a person who migrated across provinces. That is I dropped the individual who moved in a different district within the same province.

For each migrant I created a variable measuring the size of his/her network. The variable was defined as number of individuals from the province of origin of the migrant that were living in the same province the migrant was located in. Since I want to estimate the effect of the network on the employment outcome of individuals, I took out of the sample individuals defined as not belonging to the labour force. In fact, it is obvious that the network cannot help a migrant in finding a job if he is not looking for it. The final sample I analysed is made up by 6248 migrants.

In table 1.a I reported the average location patterns of all observations of the original sample. That is, both migrants and non-migrants, and individuals in and out the labour force, are present in the table. In rows is reported the province of residence and in columns the province of birth of the migrants.

The more represented province is the Western one, with 3894 out of 14875 individuals living there. The table permits to focus easily on the migrants coming from the provinces affected by the war. In fact North and Eastern provinces were not covered by the survey and so the individuals that were born in those provinces are all migrants . 153 individuals out of 14875 were born in the Northern and Eastern provinces, and their preferred destination is Western province, followed by North-western and North-central provinces.

Table 1.b reports the frequencies of the destinations of migrants on the average among quarters<sup>6</sup>. Western province is by far the preferred destination among migrants. Between the second quarter of year 1997 and the first quarter of year

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<sup>6</sup> From now on, descriptive statistics are referred to the sample made up of all the migrants.

1999, 493 migrants (36.6% of the total of migrants population) were living there. North-central province is in the second place, with 21.5% of the migrant living there. The most neglected destination is the Southern province, that was chosen only by 5.2% of the migrants, while Central, North-western, Uva e Sabaragamuwa all have a “share” around 9%.

In table 1.c, instead, I reported the frequencies of origins of migrants in average. Central and Southern provinces are the most common origins among migrants, with respectively 22% and 20% of individuals that were born there. 15% of migrants were born in Sabaragamuwa. North-western, North-central and Uva, instead, originated much less migrants. This is the case also for the two provinces affected by the war, that is Northern and Eastern. Therefore, according to the sample, some provinces like Western and North-central are “net importer” of migrants, while others, like Southern, Central and Sabaragamuwa are “net exporters”.

A factor that is likely to affect migration is inequality in economic performance and poverty incidence across provinces. As table 1.d<sup>7</sup> shows, there is a sharp difference in poverty incidence across provinces. Poverty incidence was by far the lowest in Western province in 1996, with a poverty headcount of 11 percent, with North-central having the next lowest poverty incidence of 21 percent. In contrast, the poorest provinces of Sabaragamuwa and Uva have headcount poverty rates of around 35 percent. The low poverty incidence in the Western Province is largely due to the location of Colombo where most of Sri Lanka’s economic productivity is concentrated. The high incidence of poverty in some other provinces is consistent with the evidence on wide disparity in provincial share of GDP, with Western province accounting for almost half of the country’s GDP. It is clear that most migrants are attracted to Western province because it offers more opportunities in terms of income, while individuals migrate from Southern province, Sabaragamuwa and Uva to escape poverty. The large and increasing inequality is a policy issue in Sri Lanka. In the last decade reduction in income poverty has been modest and uneven, with the gains being largely limited to Colombo and its neighbouring districts. Not only the

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<sup>7</sup> The data were taken from the Department of National Planning and the Department of Census and Statistics of Sri Lanka. Unfortunately, Northern and Eastern provinces are still excluded from the table.

differences across provinces and districts, but also the gap between average urban and rural incomes has widened.

Another factor that is likely to affect migration is an uneven distribution of unemployment rates across provinces. Two facts need to be highlighted. First of all, the distribution of unemployment rates across provinces is less uneven than we could expect. Sri Lanka's unemployment rate is 8.8% and apart from Uva (6%) and Southern province (10.6%) , in the other provinces the rate is close to the average.

The second fact is that unemployment seems to be not correlated with poverty incidence. In fact, as Table 1.d shows, unemployment figures for provinces do not show any pattern of association with their ranking in terms of poverty incidence in Sri Lanka. In the Western province, for example, unemployment rate is slightly above the national average, despite its superiority in terms of GDP share. The Uva province, on the contrary, records the lowest unemployment rate (6%) despite having the highest poverty incidence (37%). Unemployment might be not correlated with high incidence of poverty in Sri Lanka for two reasons. Firstly, evidence suggests that many college graduates and highly educated young people are unemployed in Sri Lanka mainly because they can afford to wait for better job opportunities. Rama (1999) analyzes unemployment in Sri Lanka and concludes that a large proportion of the unemployed are young, relatively educated individuals who live with their parents and benefit from family support to continue their job search. Such unemployed individuals tend to seek a relatively good job, either in the public sector or private sector activities that are protected heavily by product and labor market regulations. Secondly, however low the wages are, the extremely poor must work simply because they cannot survive without a source of income<sup>8</sup>.

Tables 1.e and 1.f show individual characteristics of the individuals. The figures are average values computed across different surveys. Migrants tend to be in their thirties, with an average age of 37 years. Individuals from Eastern and North-central provinces are significantly younger, with an average age respectively of 31 and 30. About sex, women are prevalent in the sample. The group from North-central

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<sup>8</sup> The unemployment figures presented here however constitute a very partial picture. To understand better the links with poverty, it will be more useful to examine the relationships between wages, underemployment and poverty, which will require additional work since statistics on underemployment are not readily available.

province is the less heterogeneous, with 60% of individuals being female. On the contrary, the group from Southern province is the most balanced, with 51% of migrants being female. The situation changes completely when we exclude individual not belonging to the labour force from the sample. In this case, 65% of individuals are men. The group from North-central province is more balanced, with 43% of individuals being female. On the contrary, in the Northern 72% of migrants are male. The most represented ethnic group is Sinhalese. This is not the case for migrants coming from the Northern province, the historical hearth of Tamil Kingdom. Among them the most represented ethnic group is Sri Lanka Tamil. Also Eastern province is inhabited prevalently by Tamil, but migrants are mainly Sinhalese. We observe that among migrants from Northern and Eastern provinces there are many Moors (Muslim), who were persecuted by LTTE. Indian Tamil are the descendants of Indian labour force imported by the British in 1920s to work in tea gardens. They distinguish themselves from Sri Lanka Tamil as far as it regards social and political matters. About marital status, the 68,8% of migrants is married. This percentage is significantly lower for migrants from the Northern and the Eastern provinces (the one affected by the war). This could be correlated with the fact that migrants from those provinces are younger than the others. Regarding educational attainment, migrants' level of education are generally quite high, especially for a developing country. On the average, almost the 70% of all migrants achieved more than 8 years of education, and the 36% of them obtained G.C.E. (O.L.), namely the General Certificate of Education Ordinary Level. This is a good level of education, which corresponds to eleven years of mandatory schooling. Moreover, the 19% of migrants achieved G.C.E. (A.L.), namely the General Certificate of Education Advanced Level, which means that they completed thirteen years of mandatory schooling. Only the 5% of the sample didn't receive any education at all. Sri Lankan education system has been celebrated in development policy circles and the economic literature for its success in providing widespread access to primary and secondary education and enabling the country to attain comparatively high human development levels for a low income economy. This achievement was the result of strategic public policy decisions, over several subsequent generations, to invest resources in education, health and other social services. Education levels are not homogeneous among

migrants: migrants from the Northern and the Eastern province are more educated, with a lower percentage of illiterates (3%), and a higher percentage of individuals who obtained G.C.E. (A.L). Migrants from the Central province and from Uva, instead, are less educated than the average. In table 1.f I also reported statistics on employment status and sector of occupation for employed individuals. On the average, the 53% of the migrants are employed, the 4% of them are unemployed, and the 43% are classified as out of the labor force. Once again, the situation is sharply different for migrants from the Northern province: only the 36% of them is employed, and the 60% is out of the labor force. About the sector of occupation of employed individuals, the 66% of migrants work in the rural sector. This could partially explain the negative correlation between years of education and employment (-0.02%). Finding a job could be harder for more educated job-seekers if the vacancies are concentrated in low-skills sectors. Once again, this statistics is different for migrants who were born in the Northern province: the 79% work in the urban sector. As far as we could see from descriptive characteristics, migrants from the northern province are in general younger and more educated than other migrants. Moreover, they tend to be less disposable at work, and if they work they are employed mainly in the urban sector.

### **3.3 Data on conflict**

To complete my analysis I collected data related to the conflict. In order to instrument for the size of the network in the wage equation of each individual, I needed indicators of conflict intensity in his place of origin in the period before the survey. An indicator of conflict intensity disaggregated by provinces and or/ district was not disposable, so I had to collect myself data and construct a suitable indicator. This part of the work is particularly related to the branch of development studies that investigates incidences and costs of conflicts. The main difficulties encountered in understanding conflicts are associated with measurement and mapping. Measuring conflict incidence raises two fundamental issues: (i) the exact definition of conflict

and the threshold at which an incident is defined as conflict; (ii) the conditions under which respondents might misreport instances of conflict.

Keeping in mind these issues, the first step of my research involved the choice of a suitable indicator to measure conflict intensity. I followed the work of Varshney (2001) on communal conflicts in India and I selected the number of deaths as indicator of the severity of the conflict. The number of deaths is a an accurate and consistent measure, comparable inter-area and overtime. One death victim in area A and one in area B have the same value. Seven deaths today have the same values as seven deaths ten years ago. Other severity indicators, for example, the number of incidents, injuries, and damaged or burned houses do not have these features. Take the example of number of incidents as an indicator of severity. To begin with, it is difficult to determine what is meant by one incident. It can be a strike between security forces and the rebels, a suicide terrorist attack, or a week-long battle between LTTE and the army to defeat a city controlled by the enemy. Moreover, it is hard to compare incidents which took place in different places and in different times. And collecting the information needed to correctly identify different incidents could be hard and expensive. This suggests that the number of incidents sometimes cannot consistently indicate the severity of a conflict.

When the indicator had been chosen, the second step involved the selection of information source. Because of the nature of the conflict, that is a civil war fought between Government army and an armed rebel force, Government Sources were not reliable. International organizations such as United Nations agencies, Amnesty International, etc did not systematically or did not report at all events related to the conflict. By performing a research in the Lexis Nexis database, I could see that some international Newspapers reported daily during most intense phases and at least weekly during relatively calm periods. So, I chose to collect data on the conflict by reading international newspapers. Unfortunately, it is reasonable to think that also International Press systematically underreported facts related to the war, because the Government imposes censorship on all media including local and international newspapers, radio and television, during most intense phases of the conflict. The use of newspaper as source of information follows the work of Tadjoeeddin (2004) on social conflicts in Indonesia. He also constructed a database of social violence by



using a "media approach"; according to him, such approach was preferable because of three reasons: credibility, availability, and efficiency. The final step involved data collection. I performed a search in Lexis-Nexis in the category 'World News' from the news source 'Asia Pacific', using the following keywords: Sri Lanka together with (alternatively) Tamil, died, death, attack, killed, killing, fighting, guerrilla, bomb, bombing, victim, deceased. I read newspaper articles that contained those words and had been published between October of year 1995 until the end of year 1998 and I counted the casualties that they reported. I considered as deaths caused by the conflict all the casualties occurred in battles, ambushes, attacks, suicide attacks, assassinations of political representatives from LTTE, and reported deaths of LTTE rebels occurred in prisons due to tortures. Then I grouped the deaths quarterly and by province, in order to obtain an indicator of conflict intensity for each province in each quarter. In table 2.a I reported the average number of deaths occurred by year in each province. As table 2.a shows, there is not much variation in deaths across provinces, because the conflict is constrained mainly in the Northern and Eastern provinces. The Western province was affected by terrorist suicide attacks, the most dramatic of which took place in January 1996 at the Central Bank in Colombo, where 86 civilians were killed. Battles were concentrated in the Northern province. At the end of year 1995 the army entered Jaffna city, the hearth of Tamil area, in the extreme north of the island. On the 13<sup>th</sup> of January 1997 the army launched the operation "Jaya Sikuru" (certain victory) and the war shifted to the district of Vavunija and Kilinochchi, that are two districts in the Northern province sited below Jaffna.

The aim of the operation was to assure a land route to Jaffna and break the isolation of the peninsula, that up to that time could be reached only by the sea. The variation in conflict intensity across provinces is reported in figures 1.a. I computed the average number of deaths occurred by quarter in 1996, 1997 and 1998. The colours of the map correspond to the figures in table 2.a Figure 1.a shows that, although the conflict is concentrated in Northern and Eastern province, also the other provinces reported deaths caused by terrorist attacks or strikes.

During the construction of the database I had to deal with inconsistencies due to the fact that the number of reported deaths often varied across different sources. Each newspaper usually reported a different figure. To solve this problem, I followed once

again the rule indicated by Varshney (2001) of using the lower figure. According to his study, when dealing with subjects that are emotionally and politically charged and where government data are unreliable, it is impossible to generate an inter-subjective consensus on the highest numbers reported, when scholars cannot find out "exactly how many" people died based on direct evidence and experience. However, it is possible to get a consensus on "at least so many people died". Therefore, by choosing the "lower figure" I have to bear in mind its downward bias. Moreover, there were often inconsistencies within the same article because when there were battles or strikes between LTTE and the army some newspapers reported the different figures claimed by Official Military Sources, LTTE sources and unofficial military sources. In this case, as I found obvious discrepancies between rebels' and army's sources, I used the figures claimed by unofficial military sources that were more equal between the two sides.

#### **4. Identification Strategy**

I will now discuss conditions under which networks emerge in the labour market and try to indicate ways in which these networks function.

I assume that only one type of job is available to workers in the model: the individual is either employed or unemployed. To generate a role for social networks in the labour market, we must begin with a positive level of unemployment in equilibrium, which could for instance be generated by exogenous job turnover, and we must introduce some sort of information problem in the labour market. For example, we could consider a model with adverse selection for the firm. Firms could choose to enlist the help of its incumbent workers and so recruit able workers from their networks. We make the assumption that the composition of networks is exogenously given. Assuming that ability is positively correlated within a network, the proportion of high ability workers will be higher on average in the incumbent high ability worker's network, as compared with the corresponding proportion in the market as a whole. At least some firms will use referrals in this case, drawing randomly from the

unemployed members of the incumbent worker's network, instead of drawing from the pool of (all) unemployed workers in the market.

Focusing on migrants networks, we would expect migrants who have been at the destination longer to contribute more to the network. In fact, if migrants arrive to destination without a job, they are more likely to be employed. Obviously, it is individuals who would otherwise be unemployed who benefit most from the network. When firms draw randomly from the incumbent worker's network, it is low ability workers in networks with a large proportion of high ability workers that benefit most from the referrals. Consequently, it is individuals with unfavourable observed characteristics, competent older migrants and women for instance, who will benefit most from the network.

Now I will try to discuss the biases that arise with the estimation of network effects with the help of a revisited, simplified version of the model set up by Munshi. As I said before, I assume that there are only two possible labour market outcomes: the individual is either employed or unemployed. Employment outcome at the destination A for individual  $i$  who was born in province B can be expressed as

$$\Pr(E_{iA}=1/X_i) = C_A + \omega_i + \beta N_{A,B}$$

where  $E_{iA} = 1$  if the individual is employed at the destination,  $E_{iA} = 0$  otherwise.  $N_{A,B}$  is the size of the network of the individual, that is the number of migrants from his origin B that are present at the destination A, divided by the population of the province of destination.  $\omega_i$  is an idiosyncratic ability term which does not vary over time and  $C_A$  is an employment shock at the destination that is common across individuals but varies over time.  $X_i$  is the set of independent variables. Both  $\omega_i$  and  $C_A$  are unobserved by the econometrician and they create problems for consistent estimation of the network effects, in the employment regression, by being correlated with  $N_{A,B}$ . In fact, both individual ability and labour market conditions at the destinations could influence the individual migration decision. If we assume that only individuals with a certain ability will decide to migrate, favourable conditions at the destination are associated with a lower ability threshold. That is, a high  $C_A$  will be positively correlated with  $N_{A,B}$  in the equation. Alternatively, improved labour market conditions could hasten the speed at which migrants achieve their target savings, increasing the rate of departure among

the more established members of the network and biasing the network effects downward. It is a simultaneity problem that affects the identification of network effects, biasing the estimation of  $\beta$  upward. The solution to the simultaneity problem is to instrument for  $N_{A,B}$  in the employment regression. A good instrument would determine  $N_{A,B}$ , while remaining uncorrelated with  $C_A$  or other direct determinants of employment. A hypothetical candidate that would appear to satisfy this condition is conflict intensity at the origin. We would expect lagged conflict shocks at the origin and employment shocks at the destination to be uncorrelated. The war deeply affects labour market in Eastern and Northern provinces because the rebels forcedly recruit civilians, including women and children, and at the same time they deprive civil population of work revenues through high taxes, decreasing labour incentives. As to the provinces not controlled by LTTE, the war is present in the form of bloody suicide attacks that are likely to produce high level of political tension but should not affect employment level.

While the use of conflict intensity as a statistical instrument may solve the simultaneity problem in this setting, we must still account for selectivity bias associated with the unobserved ability term  $\omega$  in the equation. Intuitively, more favourable conditions at the destination lower the (unobservable) quality of the migrants, biasing the estimation of  $\beta$  downward. Munshi solves this problem by treating  $\omega_i$  as an individual fixed effect in the employment regression. Unfortunately, we cannot do the same because we don't dispose of panel data. Consequently, we have to keep in mind these estimation bias when interpreting empirical results.

## 5. Empirical results

### 5.1 OLS regression

I developed a simple linear probability model to estimate network effects in the employment equation<sup>9</sup>. The dependent variable is a dummy (Employed) which takes value one if the individual is employed, zero otherwise. The sample is composed of all the migrants interviewed in eight rounds of the Labor Force Survey, from the second quarter of year 1997 until the first quarter of year 1999. Only individuals that belong to the labor force were included in the sample. Thus the dependant variable assumes value equal to zero only for unemployed individuals, that is individuals that are not working but are disposable at work. I ran the basic OLS equation:

$$\Pr ( E_i = 1|X) = X\beta + \varepsilon$$

On the left side of the equation I wrote the probability for each individual to be employed given a set of variables including individual characteristics as well as exogenous shocks.  $X$  is the vector of explanatory variables. The first element of  $X$ , that is  $X_1$ , is the size of the network for the migrant at the destination. The other regressors are age, age squared, years of education, controls for sex, region of residence, and quarter in which the survey was taken. I am interested in estimating the effect of the explanatory variables on the probability of the individual of being employed. Regarding the size of the network, that is  $X_1$  in the equation above, if we assume that firms use workers' referrals in their employment decisions, then the appropriate measure of the network is the proportion of *employed* migrants at the destination (who are in a position to provide job referrals). Columns *I* and *II* of table 4 report estimation results of the OLS regression. In column *I*, I use the proportion of migrants at the destination as the size of the network, while in column *II*, I use the proportion of *employed* migrants. More in detail, the variable that represents the size of the network for individual  $i$  is computed as the number of persons (or employed persons) that were born in the province of origin of the migrant  $i$  and were living in

his/her province of destination at the time of the survey<sup>10</sup>, divided by the population at destination. To correctly identify the size of the network, I defined a migrant as a person who migrated from a province to another, that is I dropped the observations of individuals who moved to another district within their province of birth. Given one standard deviation increase in the size of the network, the probability of being employed is augmented by 1%. The estimated effect is significant at 0.1% level. When I define the network as number of employed contrymen, the estimated effect are larger: given one standard deviation increase in the size of the network, the probability of being employed is augmented by 1.3%. The estimated effects are very low, especially considering that the mean level of employment in the sample is 93%. As regards the others explanatory variables, being a woman reduces the probability of being employed but only by 2%, and the estimation is significant at 10% level. One more standard deviation in the age of the migrant increases his probability of being employed by 30%, while one more standard deviation in his square age decrease it by 28%. This means that the probability of being out of a job is highest for the youth, and declines rapidly with age. Under the quadratic specification adopted for the age variable, the unemployment probability increases again as individuals grow old. Regarding education, one more standard deviation in the years of schooling attained by the individual decreases his probability of being employed by 11%, and the result is significant at 1% level. The result is astonishing, but it is coherent with the negative correlation between years of education and employment that we found out in section 3.2.2. The negative relationship between years of schooling and probability of being employed is related the education system of the country and to the peculiarities of its labor market. Rama (1999) addressed the problem of unemployment among educated youth in Sri Lanka. The spectre of 'Educated Unemployment' surfaced as a critical issue in the wake of expansion of university education in Sri Lanka in late 1960s. Already in 1971, a report from ILO argued that unemployment among the educated had partly resulted from their high aspirations on entering white-collar employment and a desire for academic education. Such explanation is coherent with

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<sup>9</sup> A drawback of this model is that, unless restrictions are placed on  $\beta$ , the estimated coefficients can imply probabilities outside the unit interval  $[0, 1]$ .

<sup>10</sup> The territory of Sri Lanka is divided into twenty-five districts that are grouped in nine provinces. I also did the analysis taking as reference the district, but the instruments were very weak..

the “skills mismatch” hypothesis, according to which educated workers expect better jobs than they can actually have access to. High unemployment rates among educated young people and their low skill levels are issues of critical policy concern for Sri Lankan Government. Youth unemployment, resulting mainly from prolonged job search, is of particular concern given the history of social unrest over youth joblessness. This is combined with another policy concern that school-leavers - grade 9, GCE O and A-levels, and university graduates are entering the labor market ill prepared for the world of work. The rate of unemployment among high school and college graduates, however, remains proportionally higher than the rate for less-educated workers. In our sample, employment rate is 0.97 among individuals who received up to five years education, it decreases to 0.92 for migrants who obtained G.C.E.(O.L) and it falls down to 0.89 for those who obtained G.C.E.(A.L). Employment rate among individuals who graduated from university is higher, but still lower than among uneducated migrants. This situation could be related to the fact that 66% of the employed individuals work in the rural sector.

About the impact of geographic location of migrants on their probability of employment, the estimated coefficients state that the Western province is by large the one that offers more opportunities. In fact, living in another province, either in the Southern or in the North-Central region, decreases the migrant’s probability of being employed by 1%.

In columns *III* and *IV* I reported the estimated partial effects of the analogous probit estimations. The probit estimates are very similar to the ones I obtained with the linear probability model<sup>11</sup>.

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<sup>11</sup> I also tried to include ethnic dummies in the vector of regressors X. Being Tamil rather than Sinhalese decreases the probability of the migrant of being employed by 0,08%, and the estimate is significant at 10% level. Ethnicity is highly correlated with the instrument (“Average deaths”). Correlation between the dummy for Sinhalese Ethnic group and “Average deaths” is equal to (-0.38); correlation between the dummy for Sinhalese Ethnic group and “Average deaths” is equal to (0.36). This happens because the war is concentrated in Northern and Eastern provinces, which are the province of origin of Tamil and Moor migrants, while there are almost no Sinhalese migrants that were born there. Consequently, controlling for ethnic group is similar to control for the province of origin of migrants. This reduces the variation in the instruments and it weakens its role in the first stage and

## 5.2 First Stage Regression

Conflict at the origin is a valid instrument for the size of the network at the destination if it is partially correlated with the size of the network once the other variables have been netted out, and if it is not correlated with the error term in the employment equation. Consider for a moment the following equation, where  $X_{1i}$  is the size of the network for individual  $i$  and  $Z$  is the instrumental variable. The instrumental variable is “Average deaths”, that is the arithmetic mean of the number of deaths which occurred due to the conflict in the province of origin of the migrant in the six quarters that preceded the survey. It is a measure of the exposure of the individual to the conflict in the eighteen months that preceded the survey. In order to consistently estimate  $\beta$  in the main equation I ask  $\lambda$  to be different from zero and  $Z$  to be uncorrelated with  $\varepsilon$  in the linear projection of  $X_{1i}$  onto *all* the exogenous variables:

$$X_{1i} = \theta_0 + \theta_2 X_{2i} + \theta_3 X_{3i} + \dots + \theta_k X_{ki} + \lambda Z_i + u_i$$

In tables 5 I reported the result of the first stage regression. The standard errors are robust to clustering with respect to migrant’s province of birth. In column / the dependant variable is Network, while in column // it is Network Employed. The excluded instrument is “Average deaths”<sup>12</sup>.

I find that there is a negative correlation between average lagged conflict and the size of the network. The migrants whose region of origin was affected by civil war in the last eighteen months have smaller networks. On the opposite, migrants that come from areas where there was no conflict in the last eighteen months have larger networks. This happens basically for two reasons: because the rebels prevent migration and because individuals don’t want to leave because they are afraid to lose their properties whenever they leave them abandoned.

The result is coherent with the dynamics of the conflict. During the period I analyzed the war was circumscribed into Northern and Eastern provinces. These two provinces

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second stage equations. Since neither the  $R^2$  nor the estimated coefficients and standard errors changed when I dropped out controls for ethnic group, I decided not to include them in the equation.

<sup>12</sup> The dependent variable, as well as the error term, is not indexed by time, but varies only across provinces. So even if the instruments are referred to different point in time, there isn’t any auto regressive process.



were completely controlled by LTTE: Government public administration was fully replaced by a rebel's one. Even justice, schools and hospitals are ran by LTTE. LTTE imposes severe restraints to the mobility of the population that lives in area under their control. I report a few quotes from the British Refugee Council reports that I think are remarkable:

*"The Commission further notes that the entire Vavuniya town is run like an Army camp. Giving evidence before the Commission in early December, Public Health Inspector Kamalakumar Chelliah said that his family is held in a camp in Vavuniya since 1996 and police have denied permission to travel to Colombo, even for family weddings or funerals."* (December 1998)

*"The government is currently hurriedly constructing 100 centers in Vavuniya signalling that the policy of detaining people from the north will continue."* (January 1997)

*"Over 12,000 people remain in Trincomalee due to return to Jaffna from the 57,000 civilians who have crossed the Vavuniya checkpoint fleeing Tiger control since last October. Most of them want to move south to Colombo to escape the war or get money from relatives abroad. Relief workers estimate fewer than 4,000 have been cleared to travel to the capital while the Tiger suicide bomber threat continues. Faced with the alternative of limbo in insanitary camps in Vavuniya many people reluctantly agree to return to Jaffna."* (March 1997)

The rebels prevent migration because, since they recruit combatant cadres among civilians, and especially among the youth, the escape of refugees means a loss of military force for them. The inner primacy of LTTE army with respect to the Government army is given by the large number of children and young soldiers ready to commit suicide and die for Eelam. Intimidations and threats are used by the rebels to recruit combatants. Most often young men and women join LTTE to save their relatives from torture and dispatch. Therefore, LTTE limits as more as possible migration from Northern and Eastern provinces. The luckiest that manage to escape have to pay a lot. It is necessary to corrupt security forces on both sides. And also during peace, it is necessary to pay fines to enter and exit LTTE territories. These limitations become tighter during most intense phases of the conflict, and relaxes

when the conflict is over. Not only LTTE, but also Sri Lankan army imposes severe restraints to the mobility of the population, especially of Tamil. There is a widespread sense of panic for suicide terrorist attacks, specially after the bombs at Colombo Central Bank in January 1996 and at the Temple of the Tooth in Kandy in January 1998<sup>13</sup>. In Colombo, every Tamil person is halted by policemen. If he/she does not speak Sinhalese, which is quite common since there are separate schools for Sinhalese and Tamil, the policemen will bring him/her into prison. The life of Tamil individuals in Colombo is actually not very safe, especially if they are not as rich as they can afford to pay a bail in case they are arrested. So, it is reasonable to think that lagged conflict up to one year and a half before have a negative correlation with the number of migrants.

Another explanation for the negative correlation between war and migration, is that the individuals do not want to leave their belongings during wartime because they are afraid not to find them anymore when they come back. Not only houses could be damaged or destroyed during battles, they could also be expropriated by the army or the rebels, and this is more likely to occur if they are abandoned.

The instruments are more effective in explaining the variable Network Employed than the variable Network, as we can see from the F statistic of the first stage regression. It seems that the rebels impose more restraints on the mobility of individuals that belong to the labor force, which is reasonable because they are more valuable as potential soldiers than women and elders, which make up the largest proportion in the population “out of labor force”.

In order to test whether there is a non linear relationship between the conflict and the size of the network, I also tried to include a quadratic specification of the conflict intensity. I found that the relationship is actually linear.

The results are robust to different specifications of the conflict indicator. I created a continuous variable which takes value in the interval (0,1) and represents the frequency with which the province was affected by the conflict in the last six quarters

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<sup>13</sup> On the 25<sup>th</sup> of January, 1998 a suicide terrorist attack killed thirteen persons in Kandy, in front of the entrance of the holiest place of Sinhalese Buddhism, where a tooth of Siddharta is believed to be hedged in.

(the variable is called “Conflict frequency”<sup>14</sup>). The results of these estimation are reported in Appendix II.

The first stage results show strong evidence that the conflict hinders migration from the provinces affected by the war. By the way, it would be very useful to compare migration from Northern and Eastern provinces before and after the conflict, to check if the war actually produced the variation we estimated in the First stage. This is not easy because it is very hard to find data on Northern and Eastern region after the breaking out of the conflict in 1983.

### 5.3 Second Stage Regression

The results of the second stage regressions are reported in table 6 and 7. In column I of tables 6 and 7 I reported the second stage results robust to clustering with respect to migrant’s province of birth. This is the geographic dimension where the instrument varies. In column II I reported also the second stage results robust to clustering with respect to migrant’s province of residence, to check whether this option would better capture variation in exogenous labor market shocks across provinces. I first consider the analysis in column I.

The results confirm what we have found out in the simple OLS regression: the size of the network has a positive, significant effect on the probability of the individual of being employed, but this effect is very small. Differently from what we observed in the OLS estimates, the effect of Network is more remarkable. One more standard deviation in the predicted size of the network increases the migrant’s probability of being employed by 4.4%. When we consider Network employed, instead, the marginal effect of one standard deviation on the employment probability is equal to 3.6%.

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<sup>14</sup> The variable was built in the following way: given indicators of conflict intensity in (t-1), (t-2), ... (t-6), I created six dummy variables equal to 1 if the number of deaths in (t-1), (t-2), ..., (t-6) were above thirty. Then I computed an arithmetic mean of those six binary variables, and I obtained a continuous variable which takes values into (0,1) and represents the number of quarters out of six in which the province of origin of the individual was affected by the conflict. It is an alternative measure of the migrant’s exposure to the conflict.

The estimated effect are much higher than in the OLS regression. This result would be counterintuitive if we thought that the OLS analysis suffered from an upward omitted variable bias. At the opposite, it would be meaningful if we thought that unobservable exogenous shocks biased the estimation of network effects in the OLS downward. Also the standard errors are much higher than in the OLS regression.

By the way, IV estimators are never unbiased in finite samples even if asymptotically consistent. The bias can be especially pronounced when instruments are weak. The partial  $R^2$  and the  $F$ -statistics are weak instruments diagnostics.

As we saw in the previous paragraph, the  $F$ -statistics is higher when the endogenous variable in the employment equation is Network Employed rather than Network (respectively 14.1 and 9.58). In the first case the value of the  $F$ -statistics is , while in the second case it is slightly lower than 10, which is considered the threshold value<sup>15</sup>.

When we cluster with respect to the province of residence of the individuals, the  $F$ -statistics is very low and it signals severe weakness of the instrument. Also the standard error of the estimated coefficient of the network variable is three times bigger than when we cluster for the province of birth.

The second stage estimation results show that “Average deaths” is a valid instrument for the size of the network in the employment equation. It performs better in predicting Network Employed rather than Network.

The Network has a positive significant effect on the individual probability of being employed. Yet this effect is very small in magnitude, around 4%.

My analysis presents some shortcomings. First of all, the Linear Probability model is not very reliable, since unless  $X$  is severely restricted, the predicted values could be outside the unit interval. I computed the number of observations for which the fitted value of the simple OLS model are bigger than one or smaller than zero, and I found that it happens for around 1350 observations out of 6248. Nevertheless, the Linear Probability model is still very helpful to find out which are the relevant variables in a regression, rather than to estimate their effect.

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<sup>15</sup> Staiger and Stock (1997) suggested that a value less than 10 is problematic and a value less than 5 is a sign of extreme finite-sample bias. They showed that  $F > 10$  ensures that the maximal bias of the IV estimator relative to OLS is no more than 10%. This threshold falls to around 6.5, for example, if one is comfortable with bias in IV of 20% of that for OLS. So a less strict rule thumb is  $F > 5$ .

Other sources of frailty of my analysis come from the data. First of all, since I do not dispose of panel data, I cannot control for individual unobserved ability (we saw that the possible correlation between the size of the network and omitted ability is a source of endogeneity). Second, I don't have any information about the year of arrival of the migrant at destination. Consequently, I cannot divide the sample into newcomers and old and more established migrants. This would be very useful for many reasons. First of all, it would allow to better identify the effect of conflict on migration. Moreover, we expect network effects to be stronger for new migrants: as they are newcomers in the labor market, they are more sensitive to information problems. Finally, while we expect more established migrants to have a positive effect on the probability of newcomers of being employed, the effect of newly arrived unemployed network members could be negative, as they are competitors in the labor market.

## **6. Conclusions**

After having illustrated conditions under which networks emerge in the labour market, I have adopted an instrumental variable approach to estimate network effects among a sample of roughly 6,000 individuals who migrated within Sri Lanka. In particular, I wanted to test whether the networks improved labour market for its members. I have found some evidence that migrants with larger size of network have a higher probability of being employed. The estimated network effects, although very small in magnitude, are qualitatively in line with recent empirical works on the effect of migrant's networks on labour market. The estimated effects of the networks are so small that they are not likely to create an externality with migration decision, which would represent a social cost of the network. It is rather possible that the network has a role in conveying migrant's labor force towards agricultural, low-skill occupation. This could in part explain the high incidence of agricultural occupations observed in the sample, despite the medium levels of education.

The original contribute of my paper is the attempt to link civil conflict with the functioning of informal institutions in labor markets.

This paper shows strong evidence that civil war in Sri Lanka affects the freedom of mobility of individuals within the country. In fact, migrants that were born in provinces affected by the conflict have smaller networks. I used this exogenous variation in migration caused by the conflict to instrument for the size of the network in the employment equation. This result is robust a variety of specifications of the network variable and of the indicator of conflict intensity.

The consequences of civil conflicts in the economy and the society as a whole are still a rather unexplored field in development economics. I think that an interesting extension of my work would imply the analysis of how the war distorts labor incentives and thus affects inflows and outflows from labor force rather than from unemployment pool. Moreover, it would be interesting to collect further data on the conflict, and to extent the lag with which the conflict is supposed to affect migration.

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**Tables: descriptive statistics**

**Table 1.a**

**Full sample: average location patterns**

<b>Birth</b>	<b>Western</b>	<b>Central</b>	<b>Southern</b>	<b>Northern</b>	<b>Eastern</b>	<b>NorthWestern</b>	<b>NorthCentral</b>	<b>Uva</b>	<b>Sabaragamuwa</b>	<b>Total</b>
<b>Residence</b>										
<b>Western</b>	3,310	110	188	66	18	52	19	34	97	3,894
<b>Central</b>	37	2,470	23	8	8	19	19	17	29	2,631
<b>Southern</b>	45	13	2,191	1	3	4	3	10	16	2,286
<b>NorthWestern</b>	76	31	14	19	2	1,555	14	3	19	1,732
<b>NorthCentral</b>	41	136	24	5	13	62	873	4	60	1,217
<b>Uva</b>	18	27	60	1	6	3	3	1,263	24	1,404
<b>Sabaragamuwa</b>	54	45	30	0	3	13	5	6	1,556	1,711
<b>Total</b>	3,580	2,831	2,530	101	52	1,708	935	1,337	1,801	14,875

**Table 1.b**  
**Average destination of migrants\*.**

<b>Province of residence</b>	<b>frequencies</b>	<b>percentage</b>
<b>Western</b>	493	36.6
<b>Central</b>	125	9.3
<b>Southern</b>	70	5.2
<b>NorthWestern</b>	133	9.9
<b>NorthCentral</b>	289	21.5
<b>Uva</b>	116	8.6
<b>Sabaragamuwa</b>	121	9.0

**Table 1.c**  
**Average origin of migrants\*.**

<b>Province of Birth</b>	<b>frequencies</b>	<b>percentage</b>
<b>Western</b>	270	16
<b>Central</b>	360	22
<b>Southern</b>	338	20
<b>Northern</b>	101	6
<b>Eastern</b>	52	3
<b>NorthWestern</b>	154	9
<b>NorthCentral</b>	62	4
<b>Uva</b>	74	4
<b>Sabaragamuwa</b>	245	15

\* The sample is composed of all migrants, including individuals classified as not belonging to the labour force.

**Table 1.d**  
**Economic indicators by province (1996)**

<b>Province</b>	<b>Share of GDP*</b>	<b>Unemployment rates</b>	<b>Poverty Headcount (%)**</b>
<b>Western</b>	43.7	8.9	11
<b>Central</b>	10.0	8.9	25
<b>Southern</b>	9.0	10.6	28
<b>NorthWestern</b>	11.3	7.8	27
<b>NorthCentral</b>	4.6	8.4	21
<b>Uva</b>	5.1	6.0	37
<b>Sabaragamuwa</b>	9.0	9.8	34

\* *Source:* Dept of National Planning.

*Note:* the shares do not add up to 100% since Northern and Eastern provinces are excluded from this table.

\*\* *Source:* Department of Census and Statistics (DCS)

**Table 1.e**  
**Individual Characteristics by Province Of Birth**

	<b>Total</b>	<b>Western</b>	<b>Central</b>	<b>Southern</b>	<b>Northern</b>	<b>Eastern</b>	<b>NorthWestern</b>	<b>NorthCentral</b>	<b>Uva</b>	<b>Sabaragamuwa</b>
<b>Average age</b>	36.7	39.6	39.2	40.4	37.1	31.2	36.6	30.1	36.9	39.3
<b>Sex</b>										
<b>Male</b>	44.3%	44.6%	47.0%	48.9%	43.5%	46.9%	43.3%	39.9%	41.9%	43.0%
<b>Female</b>	55.7%	55.4%	53.0%	51.1%	56.5%	53.1%	56.7%	60.1%	58.1%	57.0%
<b>Ethnic group</b>										
<b>Sinhalese</b>	77.3%	89.2%	80.4%	95.6%	12.1%	61.9%	93.3%	93.4%	77.4%	92.4%
<b>Sri Lanka Tamil</b>	13.4%	3.1%	9.8%	1.6%	67.3%	17.3%	2.6%	2.0%	13.0%	4.0%
<b>Indian Tamil</b>	1.7%	0.9%	4.2%	0.5%	2.4%	1.2%	0.5%	0.3%	3.9%	1.8%
<b>Sri Lanka Moor</b>	6.5%	5.7%	4.6%	2.2%	18.1%	16.4%	3.4%	3.8%	3.0%	1.2%
<b>Malay</b>	0.5%	0.8%	0.5%	0.0%	0.0%	1.5%	0.2%	0.5%	0.8%	0.2%
<b>Burgher</b>	0.5%	0.1%	0.5%	0.0%	0.2%	1.8%	0.0%	0.0%	1.6%	0.2%
<b>Other</b>	0.1%	0.2%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.2%	0.3%
<b>Marital status</b>										
<b>Never married</b>	25.5%	20.0%	20.8%	19.8%	33.9%	36.4%	22.7%	32.8%	23.0%	20.5%
<b>Married</b>	68.8%	73.7%	72.4%	74.6%	59.3%	60.7%	70.7%	65.6%	71.3%	71.1%
<b>Widowed</b>	4.7%	5.3%	5.9%	5.0%	5.3%	2.6%	6.0%	0.8%	4.5%	6.8%
<b>Divorced</b>	0.2%	0.2%	0.2%	0.1%	0.2%	0.0%	0.0%	0.3%	0.2%	0.2%
<b>Separated</b>	0.8%	0.7%	0.7%	0.5%	1.4%	0.3%	0.7%	0.5%	1.0%	1.4%

**Table 1.f**

**Individual characteristics by Province of Birth**

	<b>Total</b>	<b>Western</b>	<b>Central</b>	<b>Southern</b>	<b>Northern</b>	<b>Eastern</b>	<b>NorthWestern</b>	<b>NorthCentral</b>	<b>Uva</b>	<b>Sabaragamuwa</b>
<b>Educational attainment</b>										
<b>No Schooling</b>	5.0%	3.0%	7.9%	3.5%	2.2%	3.8%	5.3%	3.5%	9.1%	5.8%
<b>less than 5 years of</b>	10.9%	7.4%	15.7%	8.8%	6.9%	7.3%	13.3%	6.9%	15.3%	11.7%
<b>5 years of Education</b>	15.7%	13.0%	18.4%	15.1%	13.6%	12.0%	19.2%	14.5%	17.4%	15.3%
<b>8 years of Education</b>	32.4%	36.2%	29.1%	32.3%	28.1%	35.2%	32.9%	39.4%	30.4%	31.8%
<b>G.C.E.(O.L), 11 years</b>	17.2%	20.6%	13.7%	18.5%	21.4%	18.5%	13.3%	13.8%	14.3%	18.2%
<b>G.C.E.(A.L), 13 years</b>	15.5%	16.6%	13.0%	17.4%	23.5%	20.2%	13.1%	18.0%	11.1%	14.5%
<b>University</b>	3.2%	3.3%	2.2%	4.4%	4.3%	2.9%	2.9%	3.9%	2.4%	2.8%
<b>Employment status</b>										
<b>Employed</b>	53.4%	50.1%	58.2%	55.2%	35.8%	49.3%	56.4%	47.0%	55.0%	53.6%
<b>Unemployed</b>	4.2%	4.6%	3.8%	3.6%	4.0%	7.0%	4.3%	5.1%	3.6%	4.3%
<b>Out of Labour Force</b>	42.4%	45.4%	38.0%	41.3%	60.2%	43.7%	39.3%	47.9%	41.3%	42.1%
<b>Sector of employment</b>										
<b>urban</b>	31.5%	35.7%	27.4%	32.1%	78.8%	39.3%	18.5%	23.3%	26.2%	26.1%
<b>rural</b>	65.9%	63.8%	65.9%	66.8%	20.6%	59.5%	81.0%	75.8%	69.2%	70.1%
<b>estate</b>	2.6%	0.5%	6.7%	1.0%	0.6%	1.2%	0.5%	0.9%	4.6%	3.8%

**Table 2.a**

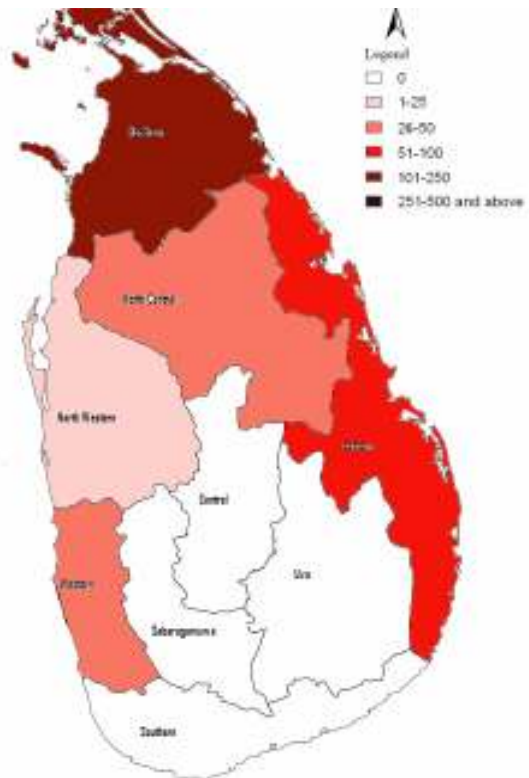
**Average number of deaths caused by the conflict by year by province**

<b>Province</b>	<b>1996</b>	<b>1997</b>	<b>1998</b>
<b>Western</b>	43	5	11
<b>Central</b>	0	0	3
<b>Southern</b>	0	1	0
<b>Northern</b>	965	1034	875
<b>Eastern</b>	207	181	71
<b>North-Western</b>	8	0	0
<b>North-Central</b>	28	15	2
<b>Uva</b>	0	4	0
<b>Sabaragamuwa</b>	0	0	0

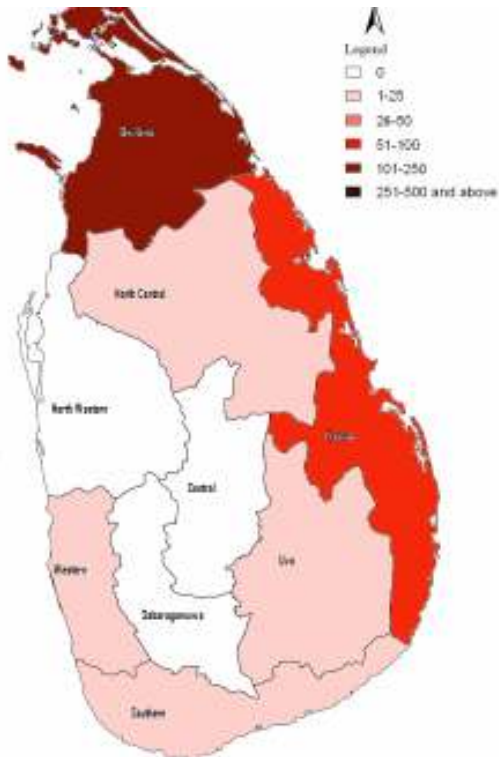
Fig. 1.b

Average deaths by province by year

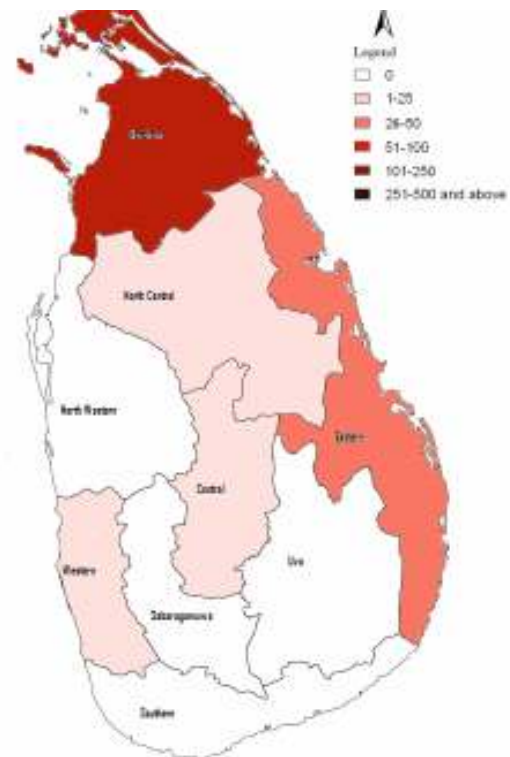
1996



1997



1998





## Empirical results

**Table 3: Description of key variables**

Variable	Description	Sample mean	Standard deviation	# of Obs.
<i>Educational and Labor market outcomes</i>				
Employed	Binary variable equal to 1 if the individual is employed	0.93	[0.25]	6428
Network	Number of migrants who were born in the province of origin of the individual and are present at the destination, divided by population in the province of destination (in thousands).	0.37	[0.036]	6428
Network Employed	Number of employed migrants who were born in the province of origin of the individual and are present at the destination, divided by population in the province of destination (in thousands).	0.18	[0.019]	6428
Woman	Binary variable equal to 1 if the individual is a female	0.35	[0.48]	6428
Age	Age (in years) at the time of the survey	38.6	[11.8]	6428
Age squared	Squared transformation of Age.	1627.8	[936.6]	6428
Years of education	Number of years of education attained by the individual	9.59	[3.89]	6428
<i>Geographic and ethnic variables</i>				
Tamil	Dummy equal to 1 if the individual is Tamil	0.09	[0.28]	
Other ethnic group	Dummy equal to 1 if the migrant's ethnic group is nor Sinhalese nor Tamil (includes Moor, Indian Tamils, Burgher, Malay, European)	0.07	[0.25]	
Southern region	Dummy equal to 1 if the individual is living in Southern province, Uva or Sabaragamuwa	0.23	[0.42]	6428
North-central region	Dummy equal to 1 if the individual is living in Central, North-Western or North-Central provinces.	0.40	[0.49]	6428
<i>Conflict intensity indicators</i>				
Average deaths	Arithmetic mean of the number of deaths that were caused by the conflict in the province of origin of the migrant in the six quarters before the survey	57.9	[220.3]	6428
Average deaths dummies	Continuous variables which takes values in the interval (0,1) and represents the number of quarters out of six in which the province of origin of the migrant was affected by the war	0.11	[0.25]	6428

**Table 4.a**

**OLS and Probit regression. Dependent variable: dummy Employed**

	OLS	OLS	Probit <sup>1</sup>	Probit <sup>1</sup>
Network	0.267 (0.06974)***		0.250 (0.0619)***	
Network Employed		0.669 (0.16401)***		0.625 (0.149)***
Age	0.028 (0.00473)***	0.028 (0.00473)***	0.013 (0.00216)***	0.01253 (0.00222)***
Age Squared	-0.0003 (0.00005)***	-0.0003 (0.00005)***	-0.0001 (0.00003)***	-0.0001 (0.00003)***
Woman	-0.041 (0.01748)*	-0.041 (0.01743)*	-0.029 (0.01179)**	-0.029 (0.01187)**
Years of education	-0.003 (0.00074)***	-0.003 (0.00074)***	-0.003 (0.00056)***	-0.002 (0.00056)***
Southern region <sup>3</sup>	-0.032 (0.01140)**	-0.033 (0.01129)**	-0.026 (0.00897)***	-0.026 (0.00876)***
North-central region <sup>3</sup>	-0.027 (0.00573)***	-0.029 (0.00480)***	-0.021 (0.00320)***	-0.022 (0.00277)***
Quarter FE	Yes	Yes	Yes	Yes
Constant	0.379 (0.08285)***	0.377 (0.08258)***		
Observations	6248	6248	6248	6248
R-squared	0.11	0.11	0.19 <sup>2</sup>	0.20 <sup>2</sup>

Robust standard errors in parentheses  
\* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%  
Standard errors robust to clustering wrt migrants' province of destination  
<sup>1</sup> Rather than reporting the coefficients, I reported the marginal effect, that is the change in the probability for an infinitesimal change in each independent, continuous variable (and the discrete change in probability for dummy variables).  
<sup>2</sup> Pseudo R-squared reported for Probit regression

<sup>3</sup> Region dummies. The category of residence is Western region.  
Western region = Western province  
Southern region = Southern province, Uva, Sabaragamuwa  
North-Central region = Central, North-Western, and North-Central province

**Table 5****First stage regression**

Dependant Variable	Network	Network Employed
Age	-0.00001 (0.0003)	-0.00002 (0.00017)
Age Squared	0 0	0 0
Woman	-0.0029 (0.00132)*	-0.0014 (0.00068)*
Years of Education	-0.0007 (0.00017)***	-0.0004 (0.00010)***
South region	0.0005 (0.00178)	0.0005 (0.00219)
North-central region	0.0256 (0.01836)	0.0127 (0.00935)
Average deaths	-0.00002 (0.00001)**	-0.00001 (0.00000)***
Constant	0.0255 (0.00626)***	0.0144 (0.00314)***
Quarter FE	Yes	Yes
F test	9.58	14.10
Partial R <sup>2</sup>	0.0190	0.0277
Observations	6248	6248
Robust standard errors in parentheses		
* significant at 10%; ** significant at 5%; *** significant at 1%		
Standard errors robust to clustering wrt migrants' province of origin		

**Table 6****Second stage regression**

	employed	employed
Network	2.954 (0.57399)***	2.954 (1.61423)*
Age	0.028 (0.00397)***	0.028 (0.00468)***
Age Squared	-0.0003 (0.00004)***	-0.0003 (0.00005)***
Woman	-0.0336 (0.00880)***	-0.0336 (0.01674)**
Years of education	-0.0009 (0.00008)***	-0.0009 (0.0001)***
Southern region	-0.0371 (0.00998)***	-0.0371 (0.01382)***
North-central region	-0.0977 (0.04504)**	-0.0977 (0.03387)***
Quarter FE	Yes	Yes
Constant	0.3201 (0.08693)***	0.3201 (0.08411)***
Observations	6248	6248
F test	9.58	2.87
Partial R square	0.0190	0.0190
	Clustering wrt origin	Clustering wrt destination
Robust standard errors in parentheses		
* significant at 10%; ** significant at 5%; *** significant at 1%		

**Table 7****Second stage regression**

	employed	employed
Network employed	4.608 (0.66734)***	4.608 (1.81568)**
Age	0.028 (0.00398)***	0.028 (0.00459)***
Age Squared	-0.0003 (0.00004)***	-0.0003 (0.00005)***
Woman	-0.036 (0.00855)***	-0.036 (0.01535)**
Years of education	-0.001 (0.00008)***	-0.001 (0.00008)***
Southern region	-0.03777 (0.01239)***	-0.03777 (0.01739)**
North-central region	-0.08062 (0.03604)**	-0.08062 (0.02470)***
Quarter FE	Yes	Yes
Constant	0.32925 (0.08086)***	0.32925 (0.08094)***
Observations	6248	6248
F test	14.10	5.93
Partial R square	0.0277	0.0277
	Clustering wrt origin	Clustering wrt destination
Robust standard errors in parentheses		
* significant at 10%; ** significant at 5%; *** significant at 1%		
<sup>(1)</sup> The estimated coefficient is divided by 1000		

## **Appendix I**

### **Highlights of the conflict**

#### **4th Quarter 1995**

On the 17<sup>th</sup> of October Sri Lankan government launched operation "Riviresa" (sunray), the largest offensive against LTTE ever, aimed at conquer Jaffna town.

On the 3<sup>rd</sup> of December troops entered the centre of Jaffna. 220.000 refugees fled from Jaffna. Sri Lankan president offered amnesty to Tamil rebels who surrendered to government forces.

#### **1st Quarter 1996**

On the 31<sup>st</sup> of January a suicide attack at Central Bank in Colombo killed 86 and wounded more than 1000 people.

#### **2nd Quarter 1996**

On the 19<sup>th</sup> of April the Sri Lankan Army launched operation Sunray II to gain control of the entire Jaffna peninsula. The military objective was to conquer Kilinochchi town and take 70 km of shattered road between Kilinochchi and Vavuniya to secure a vital supply line to Jaffna. As a matter of fact Jaffna was isolated because the rest of Northern province was still controlled by LTTE. Opening a land route to Jaffna was strictly necessary to provide population of food and to allow 400000 refugees trapped in Vanni to return back to Jaffna.

#### **Focus on freedom of movement:**

The Army will not permit people between the ages of 15 and 30 fearing Tiger guerrillas hidden among them. The LTTE also enforces its restriction on young people leaving the Vanni. A large number of youths are forced to remain and reports say the LTTE has significantly increased its cadre. Older people and families pay heavy fees for exit permits. Most people are heading for relatives in Colombo or the new twice weekly boat service to Jaffna from Trincomalee which currently has a six week waiting list. Arrests of Tamils in Colombo continue as security forces believe

Tiger suicide bombers are hidden among 150,000 refugees from the north. Human rights organisations have launched a Colombo Citizens Committee to monitor human rights violations during military search operations.

### **3rd Quarter 1996**

On the 18<sup>th</sup> of July LTTE attacked an army camp at Mullaitivu, killing more than 1400 soldiers and capturing huge stocks of arms and ammunition.

The battle lasted ten days and it was the biggest in thirteen years of war.

On July 24 two bombs exploded in a train killing 62 people near Colombo.

On July 26 the army launched an offensive against Tamil stronghold in Kilinochchi. 200000 refugees fled Kilinochchi town.

On September 29 the army captured Kilinochchi town after a week of fighting. The loss was a psychological blow to the LTTE and attention will from then on focus on the strategic crossroads town of Mankulam 45 km south, where many of the 200,000 refugees from the fighting had sought shelter.

### **4th Quarter 1996**

Many strikes all over the country, especially in Eastern province. Northern province relatively calm. The two sides are preparing for new offensives.

### **1st Quarter 1997**

2000 Tigers attacked Paranthan, in Kilinochchi district, causing more than 500 casualties among soldiers and rebels and destruction of huge amounts of weapons.

The Liberation Tigers of Tamil Eelam (LTTE) challenged government control of the two key towns in eastern Sri Lanka mounting simultaneous assaults on the China Bay airbase in Trincomalee and Vavunativu Army camp in Batticaloa on the 6<sup>th</sup> of March. Reports say over 270 died on both sides. After a LTTE attack on the Valaichenai police station in Batticaloa District on 4 March, the police fired on Peithalai refugee camp injuring six people including three children.

## **2nd Quarter 1997**

The Sri Lankan Army launched *Operation Jayasikurui* (Certain Victory) on 13 May using 20,000 troops, to open a land supply route from Vavuniya to Jaffna through territory controlled by the Liberation Tigers of Tamil Eelam (LTTE).

The Army's advancing columns plan to link up at Puliyankulam, the junction town where the Jaffna road branches to Nedunkerni and the Tiger heartland of Mullaitivu. The capture of the Vavuniya-Jaffna and the Nedunkerni-Puliyankulam roads will isolate Mullaitivu and reduce LTTE control over the population denying manpower resources for recruitment. After the loss of Jaffna, the Tigers place great importance on the Vanni, where their command and control centres, fuel and arms stores and underground hospitals lie. Vital LTTE supply routes linking the north and the east run through the Vanni. Speaking to the BBC on 13 May former Airforce chief Harry Goonetilleke said that *Operation Certain Victory* was inevitable as government supplies to Jaffna by air and sea were proving highly expensive.

## **1st Quarter 1998**

Sri Lanka's most sacred Buddhist shrine the *Dalada Maligawa* or Temple of the Tooth in the Hill Country's Kandy town was extensively damaged when suspected guerrillas of the Liberation Tigers of Tamil Eelam (LTTE) exploded a massive truck bomb on the 25<sup>th</sup> of January. Thirteen civilians, including two children, were killed and four of the suicide bombers also died in the blast. St Paul's church in the vicinity was badly damaged. The tooth relic of the Buddha, believed brought from India in the 4th Century AD and enshrined in *Dalada Maligawa* in the 16th Century, was unharmed. The *Dalada Maligawa* has remained a symbol of Buddhist culture in Sri Lanka and a centre for pilgrimage.

DEPUTY Defence minister Anuruddha Ratwatte told Parliament on 10 June that 208 soldiers died and 63 were missing in 12 days of fighting near Mankulam in *Operation Jayasikurui* (Certain Victory) since 28 May. Mr Ratwatte also claimed that 225 Tigers were killed. Reports say another 105 soldiers died in intense fighting after 11 June. But by the end of June the Army was still outside Mankulam, the last heavily-defended Tiger town before Kilinochchi, 22 miles north. According to reports, the Army gained control of Thunukkai road, west of Mankulam in late June.



Sources say a number of villages along the Vavuniya-Mankulam road captured by the Army have been destroyed. These areas have been planted with landmines, further restricting the movement of the people

THE Sri Lankan Army launched *Operation Indra Sera* (Solar Power) on 22 June and captured part of LTTE-held Vaharai area, north of Batticaloa. The Defence Ministry says 33 Tigers were killed. Vaharai has been a Tiger stronghold for several years, enabling attacks south of the Welikanda-Batticaloa road and amphibious assaults further south. According to reports, the capture of Vaharai will also affect LTTE shipments to the Vanni war zone.

## Appendix II

### Analysis using as instrument “Conflict frequency”

**Table I First stage regression**

Dependant Variable	Network	Network Employed
Age	-0.00011 (0.00026)	-0.00008 (0.00014)
Age Squared	0 0	0 0
Woman	-0.00308 (0.00137)*	-0.0015 (0.00070)*
Years of Education	-0.00064 (0.00014)***	-0.00037 (0.00008)***
South region	0.00186 (0.00199)	0.00132 (0.0019)
North-central region	0.02736 (0.01804)	0.01377 (0.00908)
Conflict frequency	-0.00584 (0.00204)**	-0.00344 (0.00103)**
Constant	0.02843 (0.00477)***	0.01593 (0.00230)***
Quarter FE	Yes	Yes
F test	6.22	8.32
p value	0.037	0.024
Observations	6248	6248

Robust standard errors in parentheses  
\* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%  
Standard errors robust to clustering wrt migrants' province of origin

**Table II Second stage regression**

	employed	employed
Network	1.38623 (0.53339)***	1.38623 -0.9041
Age	0.0283 (0.00400)***	0.0283 (0.00450)***
Age Squared	-0.00029 (0.00004)***	-0.00029 (0.00005)***
Woman	-0.00215 (0.00088)**	-0.00215 (0.00090)**
Years of education	-0.03773 (0.00883)***	-0.03773 (0.01685)**
Southern region	-0.03438 (0.00902)***	-0.03438 (0.00954)***
North-central region	-0.05651 (0.02477)**	-0.05651 (0.01690)***
Quarter FE	Yes	Yes
Constant	0.35498 (0.08038)***	0.35498 (0.07717)***
F test	8.18	3.94
Partial R <sup>2</sup>	0.0695	0.0695
Observations	6248	6248
	Clustering wrt origin	Clustering wrt destination

Robust standard errors in parentheses  
\* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%  
<sup>(1)</sup> The estimated coefficients and standard errors are divided by 1000

**Table III Second stage regression**

	employed	employed
Network employed	2.35189 (0.79686)***	2.35189 (1.34314)*
Age	0.02833 (0.00400)***	0.02833 (0.00447)***
Age Squared	-0.00029 (0.00004)***	-0.00029 (0.00005)***
Woman	-0.00217 (0.00086)**	-0.00217 (0.00087)**
Years of education	-0.03846 (0.00861)***	-0.03846 (0.01638)**
Southern region	2.35189 (0.79686)***	2.35189 (1.34314)*
North-central region	0.02833 (0.00400)***	0.02833 (0.00447)***
Quarter FE	Yes	Yes
Constant	0.35691 (0.07768)***	0.35691 (0.07532)***
F test	11.22	5.88
Partial R <sup>2</sup>	0.0857	0.0857
Observations	6248	6248
	Clustering wrt origin	Clustering wrt destination

Robust standard errors in parentheses  
\* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%  
<sup>(1)</sup> The estimated coefficients and standard errors are divided by 1000