Entrepreneurship and Shocks: Evidence from Developing and Transition Countries

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I confirm that the first chapter of the thesis has been co-authored with Tommaso Ciarli (University of Sussex) and Carlo Menon (OECD). I contributed to 75% of the work on this chapter. I collected the conflict data, prepared the dataset for analysis and choose the estimation and the identification strategy. Finally, I drafted the first version of the research paper.

Chapter 2 and chapter 3 are entirely my own contributions.

Signed (Candidate):

Abstract

A large stream of the recent literature suggests that entrepreneurship boosts economic development, but a key question remains as to how different forms of entrepreneurship, both in developing and transition countries, are affected by shocks. The first chapter of the thesis explores the relation between the change in conflict intensity and the investment in private economic activity (PEA) of nearby households in Afghanistan, exploiting a unique dataset. The analysis identifies the effect of different indicators of conflict on a range of different types of PEA, using a shift-share Instrumental Variables (IV) strategy. The results show that agricultural and low capital-intensive self-employment increase as a consequence of an increase in conflict intensity. The second chapter of the thesis is the first study that links extensive and intensive measures of child labour to conflict in Afghanistan between 2007/8. The effect of conflict on child labour is identified using an IV strategy. The results show that an increase in conflict intensity has a positive impact on the extensive margin of child labour supply and that this increase is entirely driven by the response of 6-12 year old female children. Interestingly, the results also show a decrease in non-domestic hours worked (intensive margin), which is significant just for younger females between 6 and 12 years old. The empirical findings are discussed in relation to the theoretical economic literature on child labour and conflict. The final chapter focuses on the impact of the financial crisis both on European and non-European transition economies. This is the first study that provides a cross-country analysis of the long-run impact of the financial crisis on the labour demand of firms in transition countries. The effect of the financial crisis on firms' labour demand is identified using data from the Business Environment Enterprise Survey 2009-2013, and an IV strategy. The findings show that the share of temporary workers shrank by around 24% between 2009/10 and 2012/13, while no significant impact of the financial crisis was found on the number of permanent workers. The analysis also shows that when we distinguish between European and non-European transition countries, the latter are those driving the results.

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Introduction

A large stream of recent literature suggests that entrepreneurship boosts economic development (see for example Acs [2006], Audretsch et al. [2006], Bandiera et al. [2013], Boettke and Leeson [2009], Iyigun and Rodrik [2004]). In developing and transition countries sometimes entrepreneurship takes the form of small-medium enterprises as in the developed world, but also sometimes as informal self-employment and even child labour. Equally, shocks to a developing economy can include factors other than shocks to the business environment typical in the developed world, such as conflict and weather changes. Those diverse shocks could affect the aforementioned forms of entrepreneurship differentially and may hinder the process of economic development in developing/transition countries. However, relatively little is known about the impacts of shocks on developing countries. This thesis focuses on shocks to the entrepreneurial environment, and addresses two key questions: what impact do shocks have on diverse forms of entrepreneurship, and how can public policies be targeted to remove these obstacles to economic development.

Both the first and the second chapter of the thesis focus on a conflict-ridden developing country: Afghanistan. Chapter one, *Conflict, Entrepreneurship and Self-Employment: Evidence from Afghanistan*,[1] explores the relation between the change in conflict intensity and the investment in private economic activity (PEA) of nearby households in Afghanistan, exploiting a unique dataset containing geographically detailed information on conflict events and on households' activity. The analysis identifies the effect of different indicators of conflict on a range of different types of PEA, differentiating across levels of formality, sectors, and capital intensity using a shift-share strategy. The results show that an increase in the conflict activity in the district is correlated with a higher probability that a household in the same district owns a small business. An additional conflict over a thousand individuals in a district increases the probability that within the district a household engages in self-employment (S.E.) of about 21.5 percentage points. The result is driven by an increase in both agricultural S.E. and in low and high capital intensive activities.

[1] This chapter describes part of the analysis done for a joint paper with Tommaso Ciarli (University of Sussex) and Carlo Menon (OECD): *Business as unusual. An explanation of the increase of private economic activity in high-conflict areas in Afghanistan*

The results are both robust to different specifications of the conflict variable and to the exclusion of the Kabul district.

Chapter two, *Child Labour and Conflict, Evidence from Afghanistan*, is the first study that links extensive and intensive measures of child labour to conflict. In the last decade the Afghan territory has seen an escalation in conflict intensity since the U.S. led coalition overthrow of the Taliban. The effect of conflict on child labour is identified using data from the National Risk and Vulnerability Assessment 2007-2008, and an IV strategy based on past conflict district shares during the Russian invasion. The results show that an increase in conflict intensity has a positive impact on the extensive margin of child labour supply and that this increase is entirely driven by 6-12 year old female children. It also provides evidence of the impact of higher conflict intensity in Afghan districts on the intensive margin response of child labour supply. Interestingly, the results show that despite an increase in the extensive margin of child labour supply due to conflict, there is a decrease in non-domestic hours worked which is significant for younger females between 6 and 12 years old. The empirical findings are discussed in relation to the theoretical economic literature on child labour and conflict.

The third chapter of the thesis: *The Differential Labour Demand Response to the Financial Crisis: Evidence from Firms in Transition Countries* focuses on the impact of the Financial Crisis both in European and non-European transition economies. This is the first study that provides a cross-country analysis of the medium-run impact of the financial crisis on firm's labour demand in transition countries. The effect of the financial crisis on firm's labour demand is identified using data from the Business Environment Enterprise Survey 2009-2013, and an IV strategy that uses the first lags of the explanatory variables. The findings show that the share of temporary workers shrank by around 24% between 2009/10 and 2012/13, while no significant impact of the financial crisis was found on the number of permanent workers. Interestingly the analysis also shows that when we distinguish European and non-European transition countries, the latter drive the results. The empirical findings are discussed in relation to the theoretical economic literature on labour demand in transition countries and the impact of the financial crisis on firms' labour demand.

Chapter 1

Conflict, Entrepreneurship and Self-Employment: Evidence from Afghanistan

Introduction

International organisations and aid agencies may be interested in knowing about which kind of entrepreneurship is more resilient towards obstacles that conflict and insecurity set on economic activities, as during and in the aftermath of wars entrepreneurship could work as leverage for economic development. Similarly, interest lies in identifying which aspects of conflict plays the biggest role in hindering private economic activity (PEA), for example the intensity of the conflict versus the impact on infrastructures and people lives. However, the relationship between conflict, economic development, and private economic activity PEA is still a puzzling one, despite the recent increase in studies investigating the microeconomic impacts of conflict. First, violent conflict has a significant negative effect on low-income countries' economic growth.[1] At the microeconomic level violent conflict reduces the incentives to invest in entrepreneurial activities by destroying physical and human capital, increasing risks, lowering expected returns, reducing labour supply via displacement and reduced education, and disrupting markets, institutions, and

[1]See for exampleChen et al. [2008a], Collier [1999], Cramer [2006], Hoeffler and Reynal-Querol [2003], Iyer and Santos [2012], World Bank [2011].

social networks.[2]

Second, entrepreneurial activity is one key determinant of economic development.[3] Reduced investments and entrepreneurship have a negative effect on output and employment. If, as generally understood, unemployment contributes to fuelling the conflicting armies [e.g. Iyer and Santos, 2012], a country experiencing violent conflict may enter a vicious cycle of conflict, reduced PEA, reduced labour demand, increased migration and enrolment into conflict, reduced labour supply, and further reduced economic activity. The reduced economic activity may contribute to fuelling this cycle.[4]

Third, there is evidence showing that in in-conflict countries there are more people employed in conflict areas than in non-conflict areas [e.g. Iyer and Santos, 2012]. There is also growing evidence that entrepreneurship, and more generally PEA, does not decrease, and sometimes increases in the aftermath of conflicts, for example leading to a rise in subsistance agriculture.[5]

How do we reconcile the positive effects of business development with the negative relationship between growth and conflict, and the evidence of resilience and increased self-employment under conflict? One possible explanation is that the negative effect of conflict on growth is transmitted through distinct micro mechanisms, which are not related to entrepreneurship, and which are stronger than the positive effect of entrepreneurship on growth (for example decreasing health and education). Another possible explanation is that the observed PEA under conflict is either non productive, or even harmful for economic growth (subsistance self-employed activities, war-related businesses) [Baumol, 1990, Naudé, 2007].

This paper provides new robust empirical evidence on the above question, reconciling the co-existence of intense conflict, increased PEA, and low output growth. We build on an unprecedented level of data granularity, substantially refining the identification of the relationship between conflict and PEA with respect to the lit-

[2] Amuedo-Dorantes and Pozo [2006], Brück and Schindler [2009], Hoeffler and Reynal-Querol [2003], Ravallion [1988].

[3] See for example Acs [2006], Audretsch et al. [2006], Bandiera et al. [2013], Boettke and Leeson [2009], Iyigun and Rodrik [2004].

[4] As suggested, among others, in Collier et al. [2004], Do and Iyer [2010], Elbadawi and Sambanis [2002], Fearon [2004], Murshed and Gates [2005].

[5] From different perspectives and countries, see for example Anugwom [2011], Brück et al. [2013], Bullough et al. [2014], Cañares [2011], Guidolin and La Ferrara [2007], Justino et al. [2012], Menon and Rodgers [2013], Nillesen and Verwimp [2010], Peschka et al. [2011].

erature.

This paper contributes to the recent stream of literature that aims at identifying both the causal relationship between conflict and self-employment and between conflict and entrepreneurship. Especially, the aim of this paper is to test the causal relation between conflict and private enterprise by examining the household's income generation choice over time, using repeated cross sections of the National Risk and Vulnerability Assessment (NRVA) from 2003, 2005, 2007-08. These include formal and informal activities such as small businesses, self-employment, illegal activities such as opium cultivation, agriculture and a number of private and public sectors employments. The analysis opens a new stream of research questions. Which households are more likely to maintain an entrepreneurial activity, under different levels of conflict? How does this compare with evidence from high income countries? How do institutions and reconstruction efforts affect this choice? What role do missing markets – credit, inputs, and labour – play in the household choice? Does regulatory capture facilitate or constraint entrepreneurial activities? Is the income choice related to the household income?

The originality of the paper lies firstly in the research question. This is the first study that aims at identifying the relationship between either changes in conflict intensity or in perceived insecurity and entrepreneurship/self-employment in Afghanistan over time. There is just one previous study [Ciarli et al., 2010b] where this relationship is tested only for 2005. The reason for the lack of previous studies is both the scarce availability of data and the challenge in the identification of the parameters of interests. Secondly, the paper is innovative because it aims at dealing with the endogeneity of conflict intensity relying on an IV approach based on past conflict district shares during the Russian invasion. Thirdly, the paper is original because the conflict data that are used for the analysis come from the Afghan War Diary. Thus, these data were reported directly by ISAF (International Security Assistance Force) troops and were not cleared, reducing the number of misreported events (a general issue when using conflict data). Finally, the paper is original because conflict intensity data were matched to the Afghan districts using the geographic coordinates of each conflict event so that the analysis could be run at the district level.

The analysis is based on a pooled cross-section analysis using both LPM (linear probability model) and IV estimation.

Section 1 briefly describes the relationship between entrepreneurship, self-employment and conflict. Section 2 describes the empirical strategy used. Section 3 discusses the results. Section 4 discusses the robustness checks. Section 5 debates the econometric concerns while section 6 describes the policy relevance of this study.

1.1 Entrepreneurship, self-employment and Conflict

Entrepreneurial activity is a key determinant of economic development [Acs, 2006, Audretsch et al., 2006, Boettke and Leeson, 2009, Iyigun and Rodrik, 2004] and supporting entrepreneurship is widely seen as a mechanism to facilitate economic growth. However, a recent stream of literature suggests that also self-employment and informal activities can lead a country to economic growth so that the analysis is extended not only to entrepreneurial households but also to the informal self-employed ones.

Acs [2006] distinguishes between "opportunity" and "necessity" entrepreneurs. Opportunity entrepreneurs create new businesses and jobs, enhance competition and production encouraging technological change leading to high levels of economic growth. Necessity entrepreneurs instead lead to low economic growth. This latter definition includes any type of informal self-employment and is a result of the existence of barriers to the creation of new businesses or to the fact that the economy is creating no wage-earning job opportunities. Acs [2006] finds that there exists a positive relationship between the opportunity ratio (number of opportunity entrepreneurs over number of necessity entrepreneurs) and the GDP per capita.

Even “unproductive” entrepreneurs [Baumol, 1990, Naudé, 2007] are a source of growth and poverty alleviation in fragile, developing [Amorós and Cristi, 2011, Banerjee and Duflo, 2007] and transition countries [Estrin et al., 2006, Smallbone and Welter, 2001]. [Naudé, 2007] points out that even though informal and survivalist entrepreneurs do not make a significant impact on economic growth they have have an anti-poverty role as they support the high proportion of small and micro-entreprises that proliferate in the aftermath of the war. [Amorós and Cristi, 2011] also recognize that necessity-based entrepreneurs, especially in developing countries, may build blocks for more productive activities in the future as they generate enough resources to increase the human capital of future generations.

Conflict has a strong negative effect on low-income countries' growth [e.g. Chen et al., 2008a, Collier, 1999]. If entrepreneurship is an essential determinant of country growth, we would expect conflict to have a negative effect on entrepreneurial activity, reconciling the macroeconomic evidence of the negative effect on growth with a

microeconomic explanation. Conflict reduces incentives to invest in entrepreneurial activity by destroying physical and human capital, increasing risks, lowering expected returns, displacement, reducing labour, and disrupting markets, institutions, and social networks [Bozzoli and Brück, 2009, Hoeffler and Reynal-Querol, 2003, Ravallion, 1988].

However, due to data constraints, only a small number of studies explore the effect of conflict on private enterprises. Ksoll et al. [2013] find the expected negative relationship (using exports), but other studies find that exposure to violence increases entrepreneurial activity [Branzei and Abdelnour, 2010], often in resource intense industries [Guidolin and La Ferrara, 2007], substitutes for basic institutions and infrastructures [Nenova and Harford, 2004], and promotes pro-social behaviour [Gilligan et al., 2011] that can be conducive to entrepreneurship. Analysis of a large cross section of Afghan households finds that conflict intensity[6] is very weakly negatively correlated with the household's choice to run a small business [Ciarli et al., 2010b].

These varying findings suggest the need for detailed empirical research on the causal relations, particularly if we consider the evidence at the macro level suggesting that entrepreneurial activity may reduce conflict (see Miguel et al. [2004] on the effect of the reduction in income on civil conflict, but also the critique by Ciccone [2011] and the opposite micro evidence in Berman et al. [2011b]). The mechanisms through which economic activity induces conflict remain unclear, as there is little evidence at the micro level [Brück et al., 2011]. Theory suggests opposite effects: shared economic advantages might reduce ethnic contrasts, or conflict might be sustained by entrepreneurs entering the market for conflict-related goods, or willing to reduce the requirements needed to enter the market [Bennett, 2010]. These contrasting effects remain unexplored.

Moreover, the number of studies on Afghanistan is very small and they do not cover an extended time period of three years like our one aims to do. The reason is the lack of data on Afghanistan and the necessity of harmonizing the geographic units (districts and provinces) in the surveys available, as they changed throughout the years.

[6] Measured with 13 indicators of subjective and objective conflict intensity from different sources.

With reference to the main intuition that conflict reduces income through a reduction in firm activities, Ksoll et al. [2013] find the expected negative relationship using exports of flowers from Kenya. They suggest that the main effect of conflict is reducing labour mobility. Narayan and Petesch [2010] finds evidence that many factories that shut down due to the intensity of the armed conflict do not go back to business even after security is re-established . Using micro data, Chowdhury [2011] finds that local armed conflict reduces the probability that a household owns a business in the high conflict region by 11 percent compared to households elsewhere in Bangladesh. Using a small sample of firms Vijayakumar [2012] finds that the civil conflict in Sri Lanka had a negative effect on firms growth in terms of assets value, turnover and employment. According to Deininger [2003], closeness to civil strife reduced investment and the number of non-agricultural enterprise start-ups in Uganda between 1992 and 2000. Besley et al. [2011] show that farmers in the Punjab decreased investments in tube wells when violence started. A similar results is found also in Singh [2013], who mainly refers to farmers' long term investments. According to the analysis by Besley et al. [2011], the reduction in investment is affected mainly by the expected level of conflict persistence. Similarly, Cañares [2011] reports lower investment and growth of firms in conflict areas in the Philippines, and Bullough et al. [2014] reports a lower entry of firms in conflict zones in Afghanistan.

However, both Cañares [2011] and Bullough et al. [2014] show that these slow-downs are accompanied by strong resilience, resulting in no difference in the number of small firms or self employed. This is confirmed by an analysis of a large cross section of Afghan households finding that conflict intensity[7] is only weakly negatively correlated with the household's choice to run a small business [Ciarli et al., 2010a]. Indeed, firms can gain from violent conflict (civil war) in resource intense industries, as it has been the case for Angola firms engaged in diamond extraction [Guidolin and La Ferrara, 2007]. A number of studies go further and find that exposure to violence even increases entrepreneurial activity [Branzei and Abdelnour, 2010]. For example, using micro data on self-employment in Colombia, Bozzoli et al. [2013] find that between 2002 and 2006 the displacement due to violence has a positive effect on self-employment in services, but with reduced income. Other microeco-

[7] Measured with 13 indicators of subjective and objective conflict intensity from different sources.

nomic studies that find an increased PEA are Abdelnour et al. [2008] for women in Sudan and Anugwom [2011] for women in Nigeria. Conflict may also influence PEA by affecting social capital. For example, Gilligan et al. [2011] and Voors et al. [2012] find that the violent conflict has promoted pro-social behaviour, respectively in Nepal and in Burundi, which can be conducive to entrepreneurship.

1.1.1 Casual and formal entrepreneurship

The core of these different findings may be that entrepreneurship is highly heterogeneous. In the recent literature on entrepreneurship in low income countries major distinctions are made. For instance, Monitor [2001] distinguish between necessity and opportunity entrepreneurship, where the first one is mainly a substitute for the lack of employment and yields low value-added. In practice, it is difficult to distinguish between households that invest in an entrepreneurial activity only because of necessity from those that invest only because they see a business opportunity [Cañares, 2011]. However, this literature seems to agree that entrepreneurship in low income countries leans toward the necessity type [Acs et al., 2004, Acs and Szerb, 2009], particularly in areas with violent conflict [Naudé, 2007].

Similarly, Lerner and Schoar [2010] distinguish between subsistence and transformational entrepreneurs. Assuming that two ideal types of entrepreneurs can be distinguished, which for simplicity can be referred to as casual (self-employed, for subsistence and necessity) and formal (opportunity seekers and transformational), the literature suggests that casual self-employment is a substitute for labour: unemployed individuals become self-employed to earn a leaving. As soon as labour opportunities re-emerge, some of these will be better than self-employment, and some self-employed will leave their activity and return to a paid job [Lucas, 1978].

The evidence collected in Lerner and Schoar [2010] shows that subsistence entrepreneurs tend to move between the labour market and self-employment, and rarely they manage to make the step towards transformational entrepreneurs. Mondragón-Vélez and Peña [2010] also suggest that casual entrepreneurs have a lower human capital than formal ones. A large study over 74 developing countries [Gindling and Newhouse, 2014] suggests that it can be usually observed a transition from casual

self-employment in agriculture, to casual self-employment out of agriculture to paid work.

1.1.2 Private economic activity choice under conflict in Afghanistan

Between 1979 and 2003 the Afghan economy went through several changes. The three major bocks of the Afghan history, that had a big impact on private economic activity, can be summarized as below.

The Soviet invasion (1979-1989)

The Russian war was mainly experienced by agricultural areas and there was a large flux of migrants not only to neighbouring countries, but also to urban centres where the population was heavily dependent on Soviet supplies for basic subsistence commodities. The agricultural harvest had by 1982 already dropped to only a fourth of its 1978 level. The rest of the decade and beyond would be marked by tremendous food insecurity [Ghiasi et al., 2015]

During the Soviet occupation, Afghanistan experienced massive trade reorientation towards the Communist bloc and isolation from Western markets. Natural gas, a sector built and heavily used by the Soviet Union, represented a large bulk of Afghan exports in the 1980s, although gas production declined and finally ceased as active wells were depleted and Soviet maintainers left the country. After the Soviet occupation, a deleterious war economy continued to function ([Ghiasi et al., 2015]).

Before Russians invaded the country much of Afghanistan's pre war urban employment was in the public sector. But as the central state crumbled during the Soviet occupation, formal economic institutions and employment opportunities gave way to an unregulated and increasingly criminal economy ([Ghiasi et al., 2015]).

Trade and agriculture, areas where the private sector dominated, increasingly became intertwined with illicit cash-generating activities controlled by political and military power. Smuggling consumer goods (such as weapons, narcotics, and even human trafficking) to Afghanistan and then re-exporting them to Pakistan had been a perpetual problem since the signing of the Afghanistan Transit Trade Agreement (ATTA) in 1965 ([Ghiasi et al., 2015]).

The Taliban years (1996-2001)

By 1998, the Taliban had consolidated control over the large majority of the country's roads, transport points and customs points. The improved stability and road access allowed for marginal resumption of economic activity.

During these years Afghanistan developed an illicit economy centred on smuggling goods and drugs. Illegal cross-border trading and smuggling became the Taliban,Äôs largest source of official revenue, Opium production spread into Afghanistan from Pakistani networks and trended upwards through the 1980s and 1990s. By 1991, Afghanistan had become the world's largest opium producer ([Ghiasi et al., 2015]).

However, regular agricultural production did begin to recover: cereal production improved throughout the 1990s, and by 1998 nearly reached 1977 levels as a result of enhanced security and good precipitation. Livestock production also improved ([Ghiasi et al., 2015]).

These gains were quickly reversed in the next year, due to a massive drought that by 2001 had brought production down to half those levels. With the influx of repatriating Afghans and population growth post-2001, there would continue to be tremendous food insecurity for many parts of the country and segments of society. Rather than being met in greater capacity by domestic supply, demand was, and continues to be, predominantly met through imports of staple crops and international humanitarian aid ([Ghiasi et al., 2015]).

International intervention (2001-2014)

The international intervention that toppled the Taliban and destroyed al-Qaeda cells in late 2001 was followed by notable economic development. From 1980 to 2001 Afghanistan had no growth or negative growth, economic growth in the years after the 2001 intervention has been inconsistent but robust at an average 10.5 per cent between 2005 and 2012.27.

However, much of the growth was not driven by either domestic demand or supply, but by international community presence, particularly after the surge in combat and stabilization operations post-2009 (military and civilian aid) ([Ghiasi et al., 2015]).

If, as suggested by some of the evidence, PEA does not fall back, or even grows,

in areas plagued by violent conflict, what kind of PEA is likely to develop? This chapter studies the available evidence for Afghanistan. [Iyer and Santos, 2012] show that despite the shortfalls in the private sector demand for labour in conflict areas, in Afghanistan, India, Nepal, and Sri Lanka there is more employment in conflict areas than in non-conflict areas. They note that the forms of employment that increase in these conflict areas are: (i) women workers replacing absent men, particularly in the agricultural sector;[8] (ii) agricultural employment; (iii) and unpaid family labour. In sum, in the South Asian countries that have experienced, or are experiencing violent conflict, conflict areas may have a higher rate of self-employment, but these are lower quality activities, involving people with significantly lower education attainment than in non-conflict areas. This is mainly because in conflict areas wages are significantly lower, due to an increase in the supply of labour and a reduction in demand, associated with the closure of most productive businesses [Iyer and Santos, 2012].

This is in line with Berman et al. [2011a] findings that in Iraq, Afghanistan and the Philippines unemployment is negatively related to insurgent activities, with the finding that Afghan individual who are exposed to violence tend to have a higher preference for certainty [Callen et al., 2014] – which may reduce the number of household holding a business, and that the perception of danger in Afghanistan reduces the disposition to entrepreneurial activity, except for resilient individuals [Bullough et al., 2014].

1.1.3 Doing business in Afghanistan

Despite high growth rates in the last decade, Afghanistan is one of the poorest countries in the world. Average per capita income in 2008 (the last year of our study) was about 325 US dollars per year, and social indicators were also at the bottom of the world rankings. Agriculture is the main source of household income and the size of the informal sector is large [Ward et al., 2008]. Ward et al. [2008] describes the Afghan economy as an "informal equilibrium not conducive to growth" where informal sector enterprises are too small, disparate and not organized to meet

[8] The "added worker" effect found in a number of empirical analysis of conflict [e.g. Justino et al., 2012, Menon and Rodgers, 2013, Shemyakina, 2011a].

the needs of the market.

Conflict has persisted in Afghanistan since the early 1980s, with a changing in intensity over time. The high level of insecurity represents a major impediment to development [Ward et al., 2008].

The World Bank firm survey in 2008 [IFC, 2014] shows that, although firms experienced growth in sales, their participation in the export market was extremely low with respect to other low income countries. Firms experienced barriers to business with respect to (i) the high cost of dealing with the government, (ii) the large number of bribes paid, and (iii) access to finance. But the main obstacles to doing business were (i) crime, theft and disorder, (ii) electricity, and (iii) political instability. That is, the violent conflict and its consequence on infrastructures. The situation was even gloomier in high conflict areas, where firms were even more constrained from doing business with respect to infrastructures, the regulatory framework, security, and skills [Iyer and Santos, 2012].

1.2 Empirical Strategy

1.2.1 Data set development

The unique dataset used for the analysis combines both household data with information on entrepreneurial activity and conflict data. The datasets were matched by district.

- **National Risk and Vulnerability Assessment (NRVA) surveys:** The originality of the analysis is that it relies on a unique data set built from three waves of risk and vulnerability assessment (NRVA) surveys that cover a large number of households (11,757 households in 2003, 30,826 in 2005, 20,668 in 2007/2008) over the whole of Afghanistan. Sample selection was not fully random; instead stratified by different agro-ecological zones. Household selection but randomly selected within wealth groups, with 6-7 households assessed within each village.

  NRVA 2003: This wave of data differs from the 2005 and 2007 - 2008 surveys both in the structure of the survey and in the sampling design. In particular, the sample frame relied on a World Food Protection (WFP) village lists. The data collection is therefore expected to be biased for larger rural settlements. The four levels of data collection of the survey are: district level, community (shura) level, wealth group level, household level. Much data collection is at the community or district level. Female interviewers were not involved in the south (resulting in poor female coverage) and in most eastern areas only rural areas and Kuchi (nomadic) population were interviewed. The survey represents one season as the survey was conducted within 3 months. The analysis covers 32 provinces, 368 districts, 1,853 villages, 5,559 wealth groups, 11,757 rural households, 85,577 persons. The survey collects information on basic demographics, health, housing, household assets, migration, risk exposure and response, livestock ownership, agricultural activities and household food consumption. The questionnaire has a common form, some data were manually entered while other data were transcribed into Teleform format and scanned. Several trainers were involved in training of interviewers, resulting in variation

in interviewer performance and a large number of part-time interviewers were hired.

NRVA 2005: The sample frame was obtained from the Central Statistical Organisation (CSO) precensus household listing. The sampling is proportional to the population, except in the smaller provinces and urban centres, where over-sampling insured enumeration of a sufficient number of households. The sample selection is based on a random selection from geographically ordered primary sampling units (PSUs), to give a random spread that represent the spatial distribution of the population. The household selection was based on the *random start* method, where 12 households were assessed in each selected village. The data collection was therefore done on three different levels: the district level, the community (shura) level and the household level. The data collection was predominantly completed at the individual and household level. In all provinces except Zabul female interviewers were recruited, to ensure a high rate of female respondents. The survey covers both rural and urban areas and the Kuchi population. As in 2003, the survey was conducted within 3 months, June-August, during or immediately after harvest, and is therefore representative of this season only. The 2005 survey was more comprehensive than the 2003 questionnaire, containing questions regarding remittances, HIV/AIDS, maternal and child health, household non-food consumption. The questionnaires used were Teleform scannable questionnaires with data quality routines built-in.

One of the main limitations of the 2005 survey was the limitation of data collection to the summer period June-August, during or immediately after harvest. As this is a time of the year where high consumption patterns were expected, the analysis inevitably produced seasonally biased results and poverty estimates that are low compared to the annual average and several other months.

NRVA 2007-2008: This wave is in many ways similar to the NRVA 2005, and intentionally so. The draft questionnaires were tested twice in the field and a pilot test of the questionnaires took place in five regions for further and final improvements. The questionnaires were translated into Dari and

Pashto. The questionnaire format was designed in Teleform (software that extracts data from paper questionnaires) to allow data scanning instead of manual data entry. Around 1.6 million questionnaire pages were completed and scanned. The fieldwork started in mid-August 2007 and lasted up to the end of August 2008. A major difference with the 2005 assessment is the removal of the seasonality bias by conducting the survey year round during all 12 months.

The sample frame came from the updated CSO pre-census household listing. The sample is proportional to population, with over-sampling of smaller provinces and urban centres. The sample selection is based on the random start method to have a better geographic distribution of the sample. The survey covers both rural and urban areas and the Kuchi population. The survey covers 34 provinces, 395 districts sampled, 2,572 clusters, no wealth groups, 20,576 households, 152,262 persons. Additional information collected in this wave included questions on household food and non-food consumption, but the questions regarding HIV/AIDS were omitted from the 2007/08 survey. The questionnaires used were Teleform scannable, with data quality routines were built-in. The training was uniform in one training session for all field staff for the whole country and was more detailed and longer than the training for the previous wave. 156 field staff were selected.

Comparability of NRVA 2007/2008 with the previous rounds: The methodologies used in order to collect the data are different, as described above, and thus only comparable to a limited extent. The radically different sampling design of the NRVA 2003 prohibits any meaningful comparison. Comparability between the 2007/8 and 2005 surveys was maintained for a number of key indicators, even though there was a significant questionnaire revision resulting in different measures.

In this paper the covariates used in the analysis were harmonised across surveys and evidence of how the dependent variable (self-employment (S.E.) or entrepreneur household) built up from NRVA 2003 can be compared with the ones built up from other two waves, even if the first is an individual survey

while the others are household surveys. See the details of the variables harmonisation across surveys in the Appendix, in Section 1.5.2. Moreover, it is reasonable to assume that the seasonality bias of waves 2003-2005 will not affect our results. In fact, our estimates rely on questions of the survey related to the whole year.

- **Afghan War Diaries (AWD):** The Afghan war diaries (AWD) is a large dataset of conflict reports recorded during the Afghan and the Iraq wars between 2004 and 2009 by US troops. All reports contain a large amount of details on each registered event, among which the geographical coordinates, the number of people (soldiers and civilians) killed and wounded, and a description of the action in which the military were involved. The data was collected by soldiers and intelligence officers, and includes intelligence information, reports of meetings with political partners, and related details. Most of the reports were not cleared by the US Government, which is likely to reduce the likelihood of misreported events. The reports where assigned to one among dozens of different categories that differentiate the types of action, going from the Afghan Police training through indirect fire and police actions, up to vehicle interdiction (please refer to the war diaries website [9] for details).

  Immediately after their release, the reports were machine coded into a large database detailing a large number of variables, including geographic coordinates, number of people involved and killed or wounded, types of action, perpetrators, etc. A number of studies have verified the reliability and the accuracy of these conflict data (see for example the discussion in Zammit-Mangion et al. [2012]).

  The 'relevant' conflict events are those events which may cause disruption of economic activity, or fear, or any other condition that could affect households' behaviour.[10] This is done using the conflict category which describes every conflict event in the dataset (e.g. exploded bombs, disruption of drug labs)[11], and excludes categories such as unexploded bombs or medical interventions

[9] https://wardiaries.wikileaks.org

[10] See [O'Loughlin et al., 2010] for a similar classification. The results using their classification of violent events instead of this study's classification of 'relevant' events do not change.

[11] See also https://www.wikileaks.org/afg/

which do not seem to be relevant for entrepreneurial activity. All the categories forming the set of 'relevant' conflict are listed in the Appendix, Table 1.23. Several robustness checks were done using alternative specifications of the conflict variable, although if not reported for brevity. The results show that the excluded categories from the specification of the conflict variable (such as unexploded bombs) do not have any impact on entrepreneurial activity. Then, each conflict event was assigned to an area (district) in order to construct the different aggregate measure of conflict per area.

- **Global Dataset on Events, Location and Tone (GDELT):** The dataset reports geo-referenced conflict events reported by media from 1979 to 2012. The event taxonomy is ultimately broken into four primary classifications: Verbal Cooperation (e.g. military agreements), Material Cooperation (actions of allied troops), Verbal Conflict (e.g. declarations of a state of war), and Material Conflict (e.g. exploded bombs etc.). This field specifies this primary classification for the event type, allowing analysis at the highest level of aggregation. In order to quantify the district level of conflict intensity from 1979 to 1989 this paper uses a sum of all these geo-referenced events.

Afghan districts were subject to changes in 2005. The district boundaries of 2003 were harmonized using the geocodes provided in the NRVA dataset. The analysis considers Afghanistan partitioned into 398 districts. See the details of the harmonisation of district boundaries over time in the Appendix in Section 1.5.3.

Identification of Household Types

There is no one single definition of private economic activity (PEA). In this paper PEA is linked to entrepreneurship, an activity that is expected to add value to production and to be commercialised. In the Afghan context such activity can be in the form of a formal business activity or of (in)formal self-employment. The richness of the NRVA questionnaire allows us to distinguish seven types of households, each of which may be affected differently by conflict.

For the analysis from 2003 to 2007/8 the first type of household is engaged in an activity that the respondent identifies as a small business.The second type is engaged

in an activity that is usually considered self-employment, such as sales of vegetables, carpet weaving and taxi driving (see Table 1.1 below for a full list), but does not own a small business. The third type of household is engaged in activities which are also considered as self-employment in non-agricultural sectors and a fourth type of household is engaged in agricultural self-employment activities.

The 2005-07/8 NRVA data is richer of information on the economic activity of the households. Therefore, it is possibile to distinguish more household types for the analysis. The main household activities are split both according to the type of work (agricultural/non-agricultural) and according to the required fixed investment in capital to run the activity (high/low capital intensive). This last split of the sample is justified by the different implications of the impact of conflict on high/low capital intensive activities. The latter ones generate, on average, a lower main household income than the first ones, also when comparing household living in conflict affected and non-affected districts, as shown in Table 1.2. It was not possible to distinguish high and low capital intensive agricultural activities because of lack of information in the survey questionnaire to distinguish them.

These household types are only used for the analysis between 2005-07/8 Thus, for the 2005-07/8 database, the following definitions of PEA are added.

- Low K: identifies households which answered that one of the non agricultural activities that require a relatively lower capital investment listed in Table 1.1, second column, was their *main* source of income.

- High K: identifies households which answered that one of the non agricultural activities that require a relatively larger capital investment listed in Table 1.1, third column, was their *main* source of income.

- Agriculture: identifies households which answered that one of the agricultural activities listed in Table 1.1, fourth column, was their *main* source of income.

- Subsistance agriculture: identifies households which answered that one of the agricultural activities for home consumption listed in Table 1.1, fifth column, was their *main* source of income.

- Agriculture for sale: identifies households which answered that one of the

agricultural activities which are not only for home consumption listed in Table 1.1, sixth column, was their *main* source of income.

Income source	self-employment types					
	(1) Non-agric.	(2) Low K	(3) High K	(4) Agric.	(5) Subsist. agric.	(6) Agric. for sale
Crop production for home consumption				Yes	Yes	
Livestock production for home consumption				Yes	Yes	
Production & sale of field crops				Yes		Yes
Prod & sales of cash crops (except Opium)				Yes		Yes
Prod & sales of orchard products				Yes		Yes
Prod & sales of livestock & products				Yes		Yes
Sales of prepared foods	Yes	Yes				
Miller	Yes		Yes			
Petty trade/ shopkeeping	Yes	Yes				
Cross border trade	Yes		Yes			
Firewood /charcoal sales	Yes	Yes				
Handicrafts (sewing, embroidery, etc)	Yes	Yes				
Carpet weaving	Yes	Yes				
Taxi/transport	Yes		Yes			

Table 1.1: **List of the sources of income considered as self-employment for 2005 and 2007/8**

Main HH activity	**Whole sample**	**Conflict areas**	**No conflict areas**
Business owners	71492.6	74676.6	65605.0
Self-employed (S.E)	78161.7	83649.5	66528.6
Agric. S.E.	57766.9	59055.0	56312.2
Non-agric. S.E.	87608.8	90992.7	75606.2
Low K	85437.1	89174.0	73460.4
High K	91809.6	94284.0	80932.4

Table 1.2: **Average income by main household activity (in Afghani).**

Table 1.3 below shows how PEA is distributed in the sample for all the years of the survey. The highest share of households earns its main income from self-employment, and in particular from subsistence agriculture. Around 70% of households whose main source of income is in agriculture cultivate mainly for direct consumption. Only between ten and sixteen percent of the households earn their main source of income from self-employment unrelated to agriculture. This percentage increases significantly from 2003 to 2007/8. Among the self employed, approximately two thirds own an activity that requires a small capital investment, and the rest

have invested in an activity with a higher capital need. Only a very small portion of Afghan households are formal entrepreneurs, earning their main income from a small business.

	Variable	Definition	2003	2005	2007/8
1	*bus*	small business	2.0	5.0	2.0
2	*se_na*	non agricultural self-employment	10.4	10.8	16.3
3	*Low_K*	lower capital intensive activities	N.A.	6.4	11.2
4	*High_K*	higher capital intensive activities	N.A.	4.4	5.1
5	*agric*	agricultural self-employment	32.8	39.5	29.1
6	*agr_sub*	subsistence agriculture	N.A.	29.0	19.7
7	*agr_sale*	agriculture for sale	N.A.	10.4	9.3
	$3 + 4 (= 2)$			10.8	16.3
	$5 + 7 (= 5)$			39.5	29.1

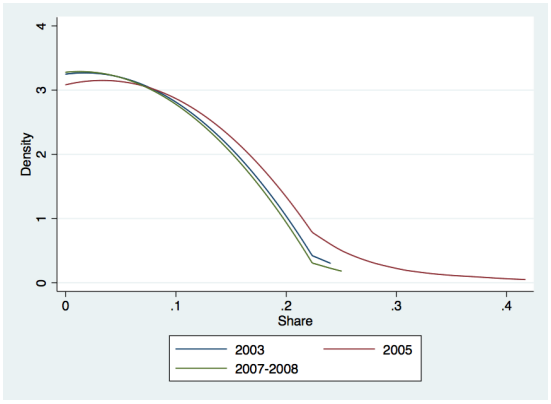
Table 1.3: **Percentage of PEA for different years of the survey**

Because of significant differences in the survey questionnaires between the 2003 wave and the most recent ones (2007/2008) we use for the pooled cross-section analysis of 2003-2008 just four different categories of household's activity (business owners, self-employment, agricultural and non-agricultural self-employment). The partition in eight different old activities is used for the 2005-2007/8 comparison.

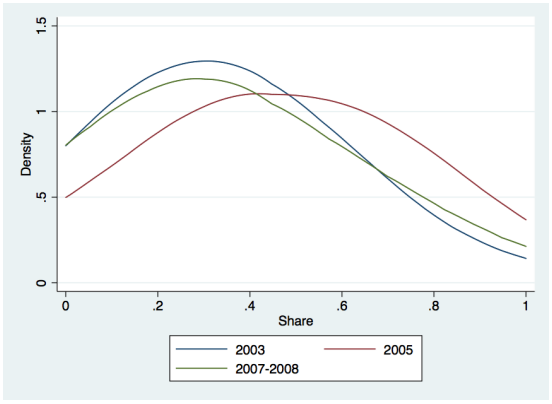
For all three types in 2003 the type of household is identified with the number of household members working in a small business or self-employment, while in 2005-2008 the type of household is identified with the income generated by a small business or self-employment activity. How the dependent variables were harmonised across the different surveys is described in detail in the Appendix, Section 1.5.2.

Finally, the three types are identified using a dummy variable that equals 1 if the household is an entrepreneurial household and 0 otherwise.

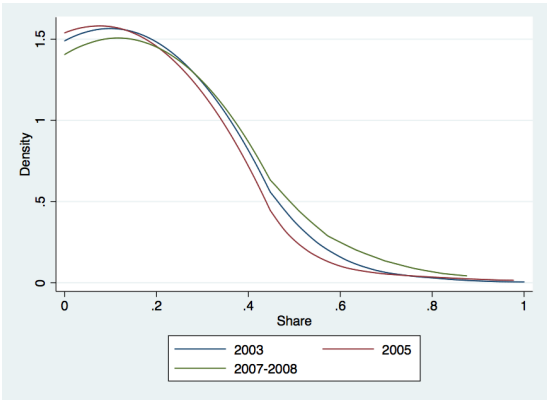
Figure 1.1 plots the distribution of the three main entrepreneurship types per district in 2003, 2005 and 2007/8. The similarity of the distributions across years suggests that the harmonisation of the entrepreneurship variable captures similar households. There are some changes from 2003 to 2008 though: the percentage of small business owners (top-left) first grows, then shrinks again in 2008; the percentage of self-employed (top-right) grow even more in 2005 and keeps growing in 2008; the percentage of self-employed in non-agriculture activities (bottom-left), though, is relative stable from 2003 and 2005 and increases only in 2008. The figure also shows that in 2005 there is the highest density of household holding a self-employment activity. This is due to a significant difference in the number of self-employment activities in agriculture, whereas the number of self employed in non-agricultural activities is lower in 2005.



(a) Small business (*bus*)

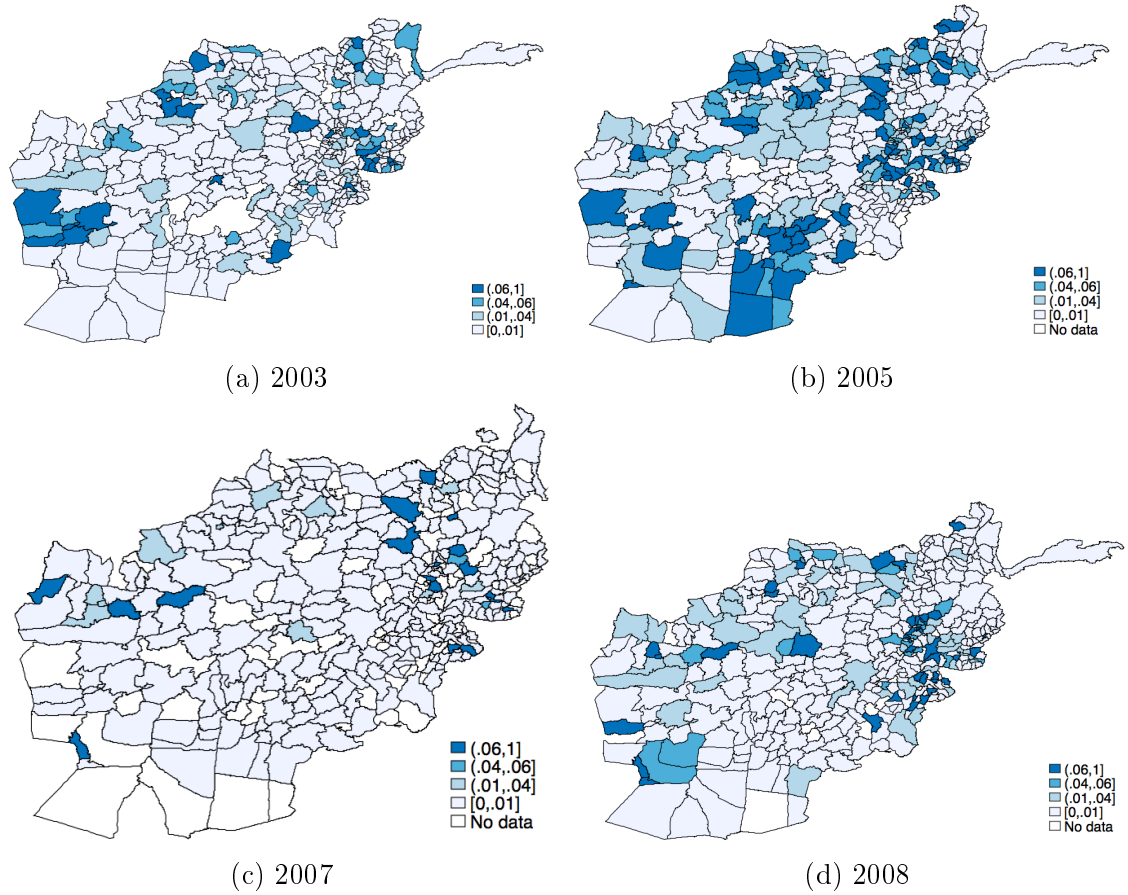


(b) self-employment in agriculture (*agric*)



(c) Non agricultural self-employment (*se_na*)

Figure 1.1: **Comparison of the distribution of PEA density by district across the three NRVA waves.** Kernel density estimations for the PEA variables (2003, 2005, and 2007/8).

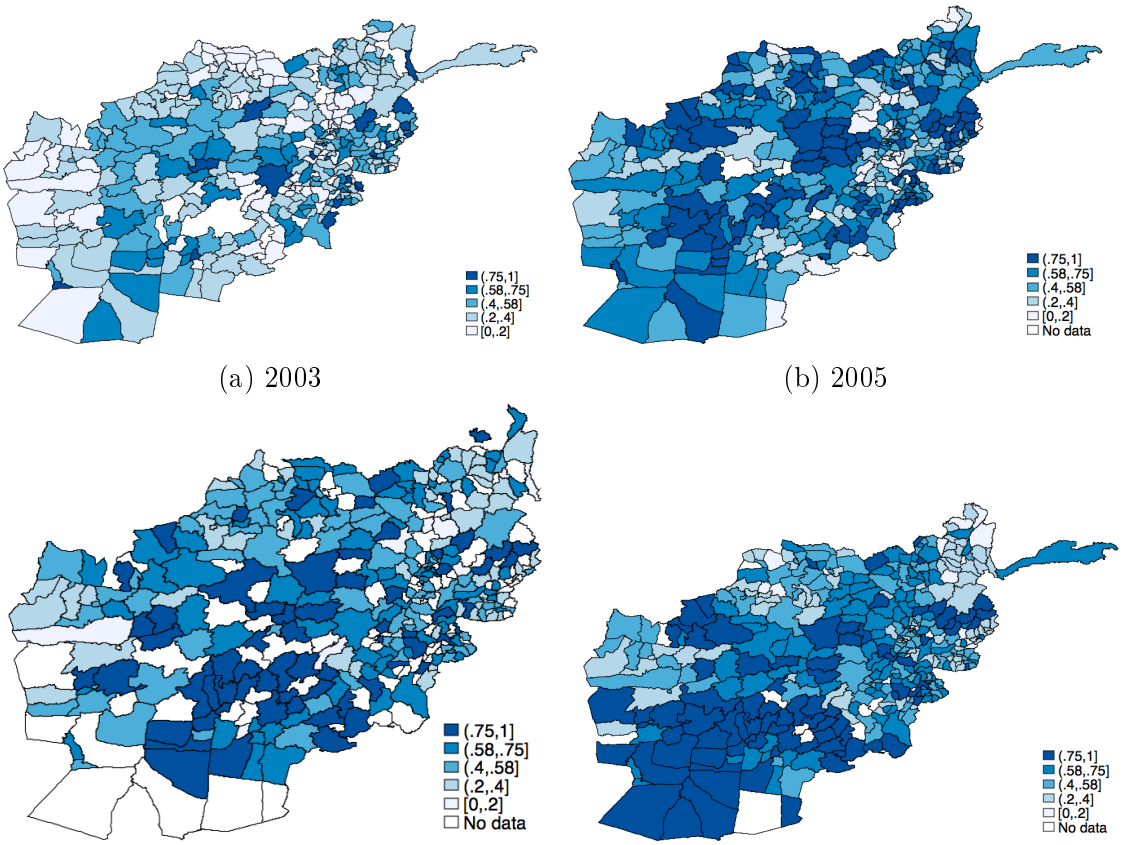


(a) 2003 (b) 2005

(c) 2007 (d) 2008

Figure 1.2: **Share of entrepreneur households per district**

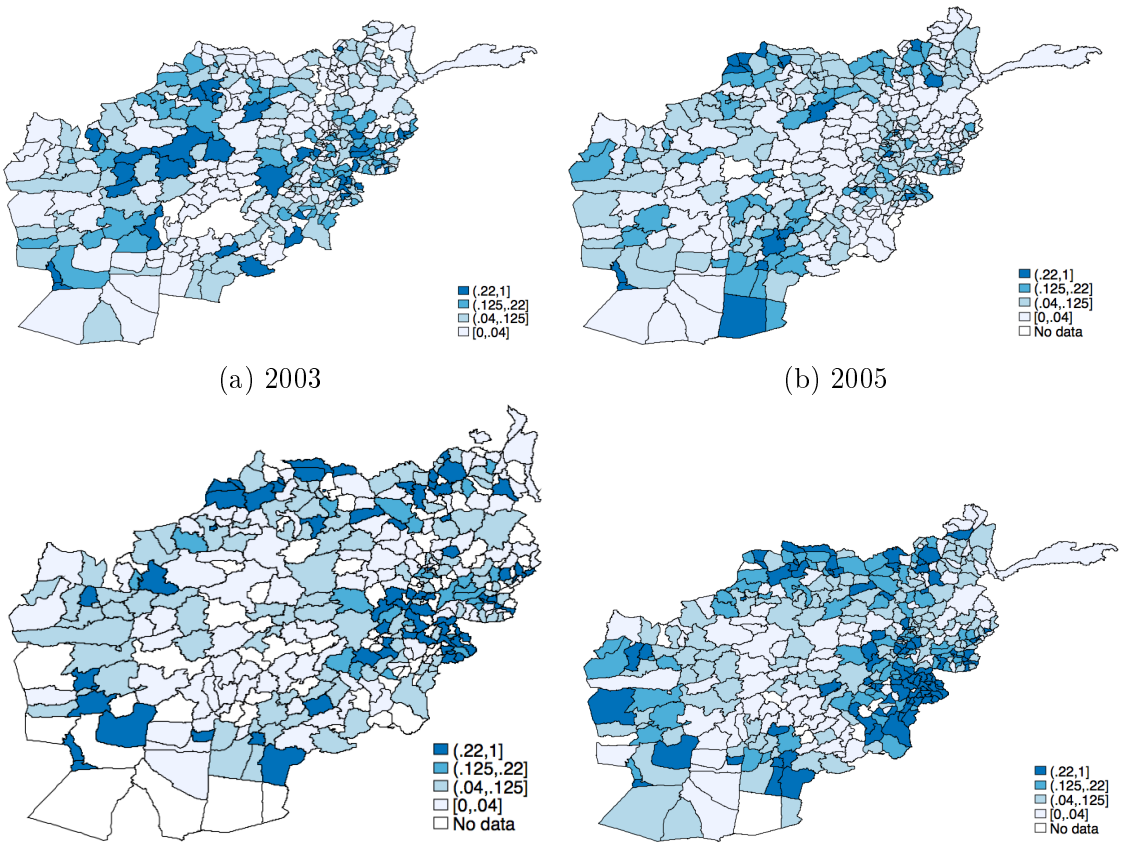
Figures 1.2, 1.3 and 1.5 below show the evolution of the percentage of, respectively, small business owner, self-employed and self-employed in non-agricultural activities, for all Afghan districts from 2003 to 2008.



(a) 2003 (b) 2005

(c) 2007 (d) 2008

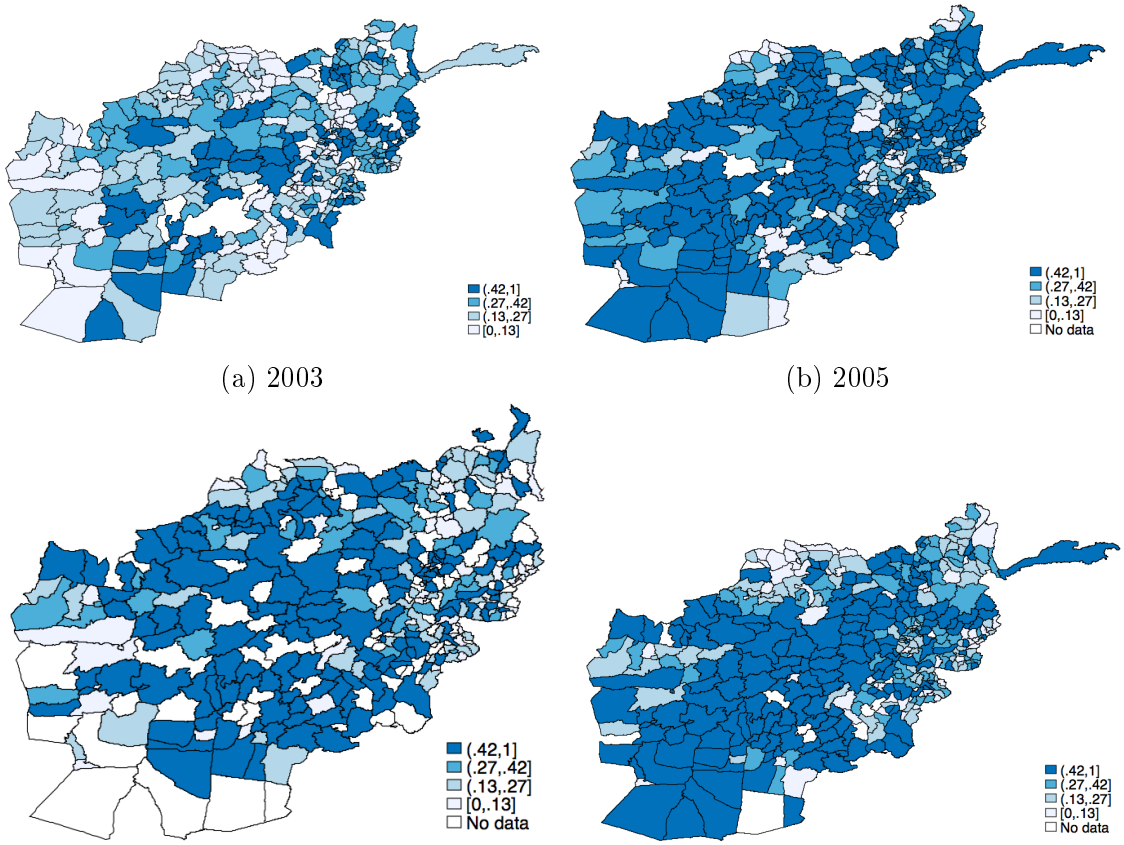
Figure 1.3: **Share of self-employed households per district**



(a) 2003 (b) 2005

(c) 2007 (d) 2008

Figure 1.4: **Share of non-agricultural S.E. households per district**



(a) 2003 (b) 2005

(c) 2007 (d) 2008

Figure 1.5: **Share of of agricultural S.E. households per district**

Conflict intensity measures

Conflict intensity, is identified at the district level using different sources of data that measure both the type and the extent of conflict activity. The source that seems most reliable and comprehensive to identify conflict events, because not cleared by the US Government is the report of the U.S.A. army. The data was publicly made available by the Afghan War Diary (AWD) [12] and are all geo-referenced.

The measures of conflict used for the main analysis are the sum of the number of conflicts per district in each year and the number of households who perceived an insecurity shock in each year. This latter information is available in the NRVA surveys which asked to every household if it perceived any insecurity shock in the previous year. As a robustness check, the analysis was done also using the total number of wounded/killed per district. These measures are normalised by the population in the district [13] in order to obtain a measure of conflict intensity that takes into account the size of the district.

A number of measures of the intensity of conflict are constructed in order to control for different sources of information, covering two or more of the household survey years (see Table 1.4 below).

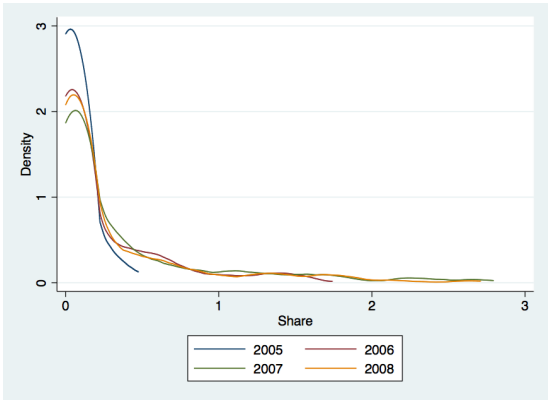
	Variable	Description	Source	Years
1	N. of conflicts	N. of conflict events normalised by population per district	AWD	2004-9
2	N. of wounded and killed	N. of wounded and killed normalised by population per district	AWD	2004-9
3	Percentage of insecurity shocks	% of household affected by insecurity shocks	NRVA	2003-8
4	N_event4	N. of material conflict events normalised N. of conflicts	GDELT	1979-14

Table 1.4: **Summary of conflict variables**.

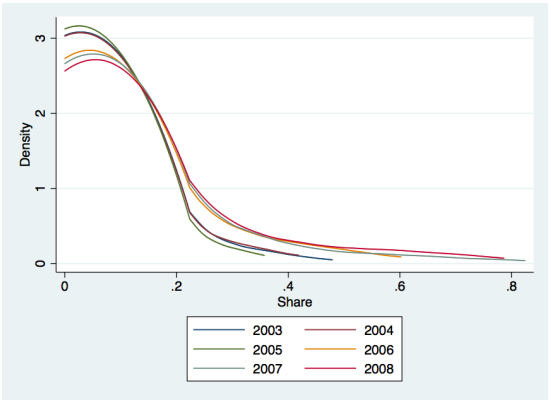
Figure 1.6 below shows the extent of the increase of the conflict looking at the distribution of the number of conflict activities per district in the different years of the survey. Due to data limitations the AWD data are used to compare 2005 and 2008 and the GDELT to compare 2003 and 2005, 2007/8. The figure shows that the percentage of districts with a large percentage number of conflict events has increased, particularly from 2005 to 2008.

[12] ($http://wikileaks.org/wiki/Afghan\_War\_Diary\_2004\_2010$)

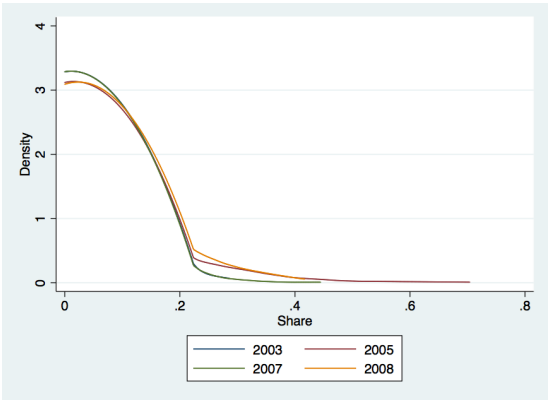
[13] The data are available by district just for 2011 from the Central Statistics Organization (CSO)



(a) Afghan war diaries (AWD)



(b) GDELT



(c) ShockInsec

Figure 1.6: **Kernel density of conflict intensity (normalised by population per district) for different years**

of Afghanistan

Figures 1.17 - 1.10 compare the geographical distribution through time of conflict using the different measures (all normalised by the size of the population). Figure 1.17: number of conflict events recorded by The US army; Figure 1.8: number of material conflict events recorded by the media; Figure 1.9: number of individuals killed or wounded and Figure 1.10: percentage of households that experience a shock related to violence and insecurity. First the figures show that the cost of the conflict in terms of human lives has increased from 2005 to 2008. Second, they also show that the conflict has moved to districts that initially experienced low conflict levels, while there is little evidence of the conflict moving out of some of the districts. This spatial variation is exploited in order to analyse the effect that increased conflict has on entrepreneurial activity in the neighbourhood.

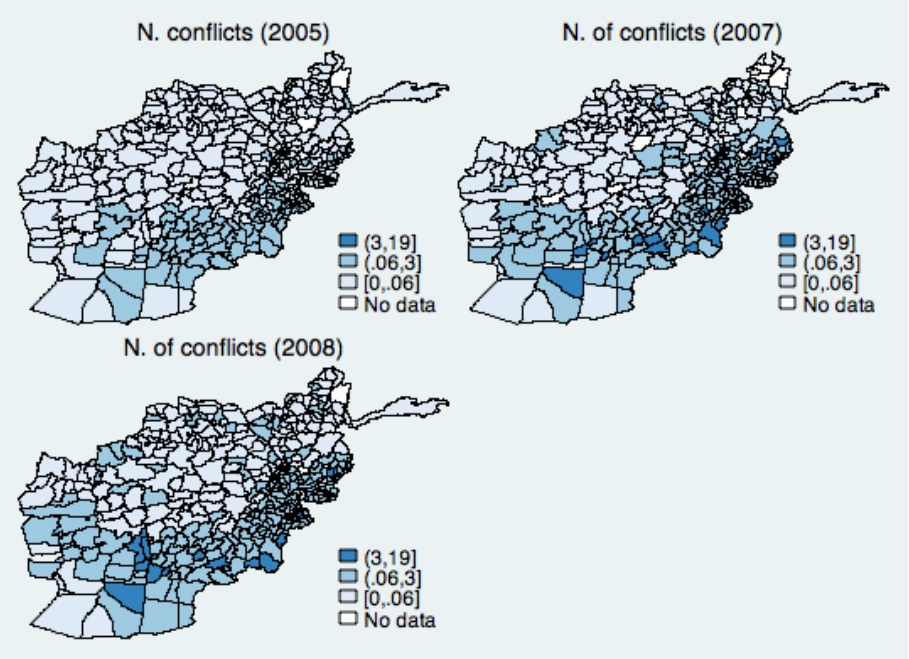


Figure 1.7: **Number of conflicts recorded by the AWD per district, 2005-2008**. *Conflicts are normalised by the district population*

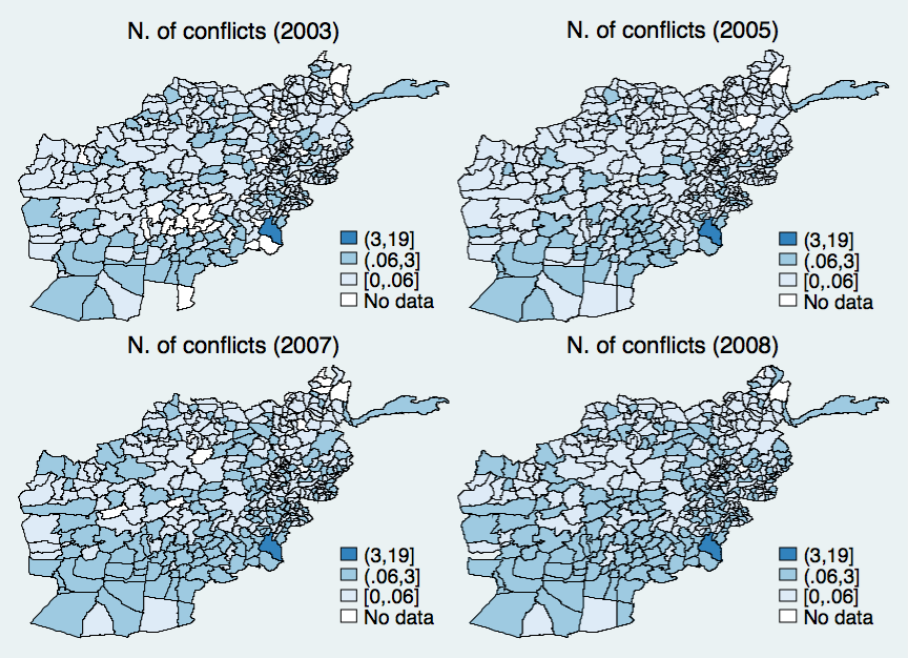


Figure 1.8: **Number of conflicts recorded by the media (GDELT) per district, 2003-2008**. *Conflicts are normalised by the district population*

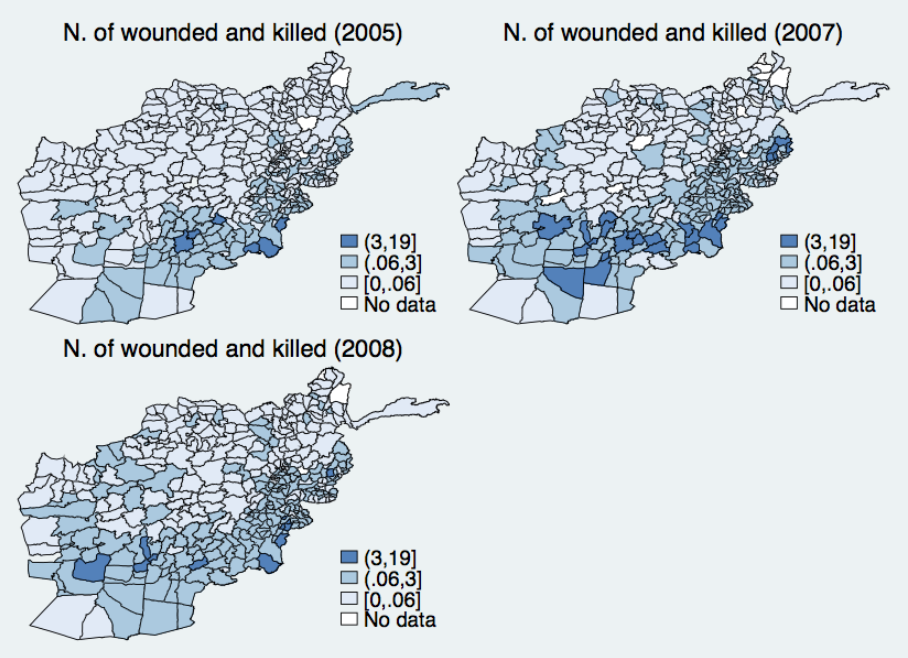


Figure 1.9: **Number of total individuals wounded and killed recorded by the US army per district (AWD), 2005-2008**. *Wounded and killed are normalised by the district population*

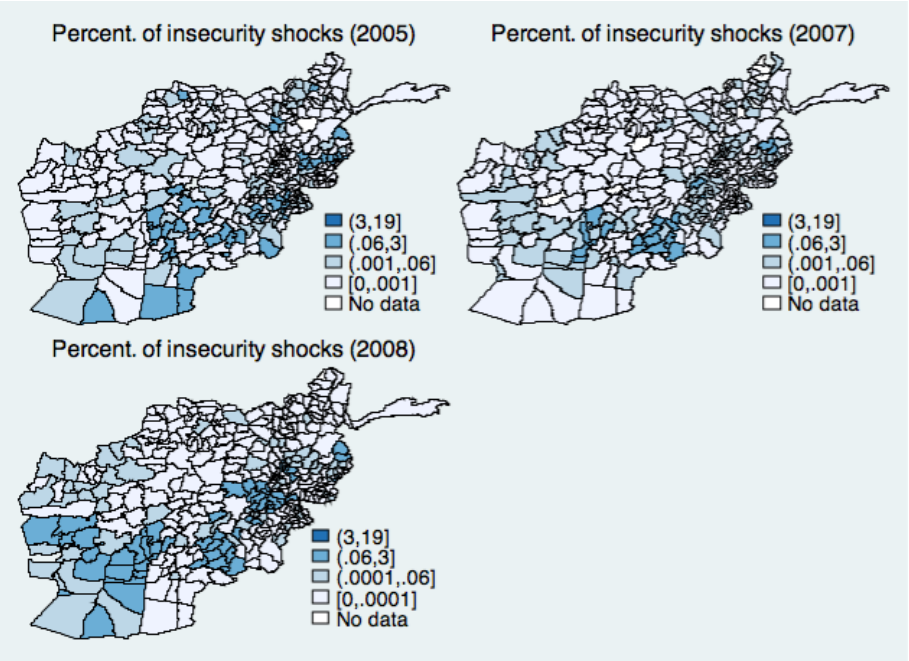


Figure 1.10: **Percentage of households in a district that have experienced a shock related to violence and insecurity in $t-1$.**

The geographical distribution of conflict events estimated with the variables used for this paper is compared with the geographical distribution of conflict in Afghanistan estimated using different data sources, methods, or variables.

The Guardian newspaper was the first one to publish figures using the Afghan Warlogs [14]. For instance, Figure 1.11 maps the distribution of IED attacks in Afghanistan from 2004 through 2009. The geographical distribution is very sim-

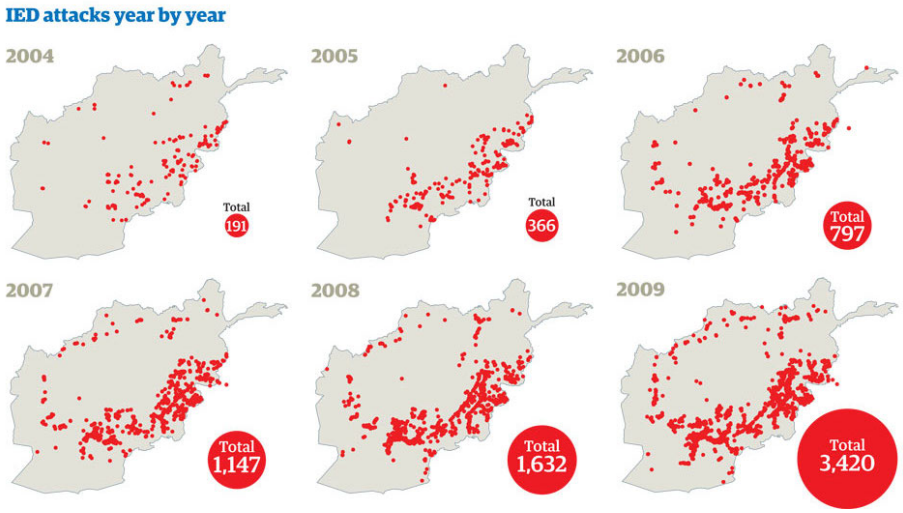


Figure 1.11: **IED attacks per year in Afghanistan**. *From the Afghan Warlogs data published by The Guardian newspaper. Source: Guardian website*

ilar to the one plotted int the figures above using the same source of data and normalised by population size. Moreover, the Guardian data also show a sharp increase in the intensity of conflict between 2005 and 2008, and how it spreads to initially unaffected areas in the North of the country.

Also using the Afghan war diaries Zammit-Mangion et al. [2012] suggest a very similar geographical distribution of the number of events through years (see the paper supporting material), covering all events, not only the ones that may be considered relevant for economic decisions. Perhaps more interesting to show here is the escalation of conflict between 2004 and 2009 across Afghanistan (see the paper for details on this is modelled). Figure 1.12 reports Figure 2 from Zammit-Mangion et al. [2012] where they plot the weekly growth in the number of events registered in the Afghan war diaries. The figure confirms what the other figures have shown: the conflict increases mainly in Helmand province and in the North, where in 2004

[14] Accessible here: http://www.theguardian.com/news/datablog/2010/jul/27/wikileaks-afghanistan-data-datajournalism

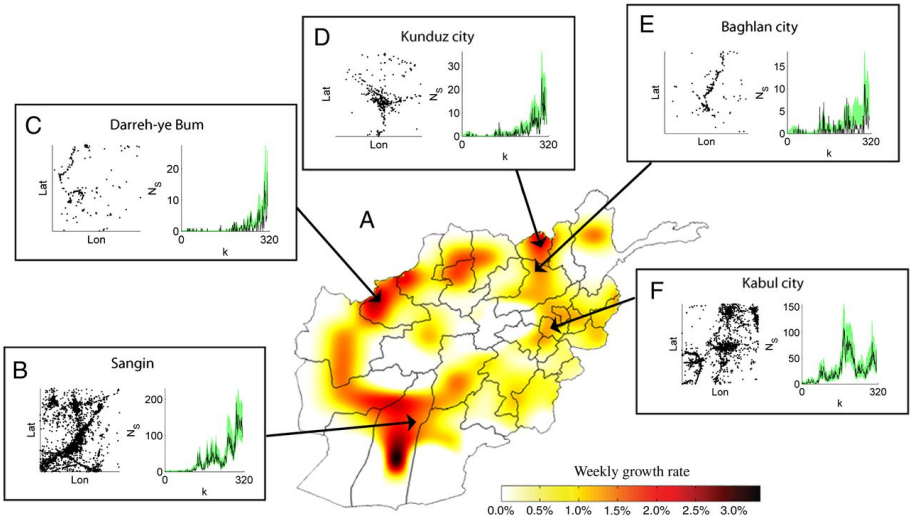


Figure 1.12: **Growth of the conflict activities registered in the Afghan war diaries between 2004 and 2009**. *Only regions with positive overall growth. For more details about the figure see Zammit-Mangion et al. [2012]*

there were no activities registered. The less significant increase in the South, were the conflict is more pronounced, is due to the fact that the number of activities were relatively already very high in 2004.

Very similar results on the number of deaths and woundings by year are reported by the Visualizing data website [15], as shown in Figure 1.13.

[15] http://www.visualisingdata.com/index.php/2010/07/visualising-the-wikileaks-war-logs-using-tableau-public/

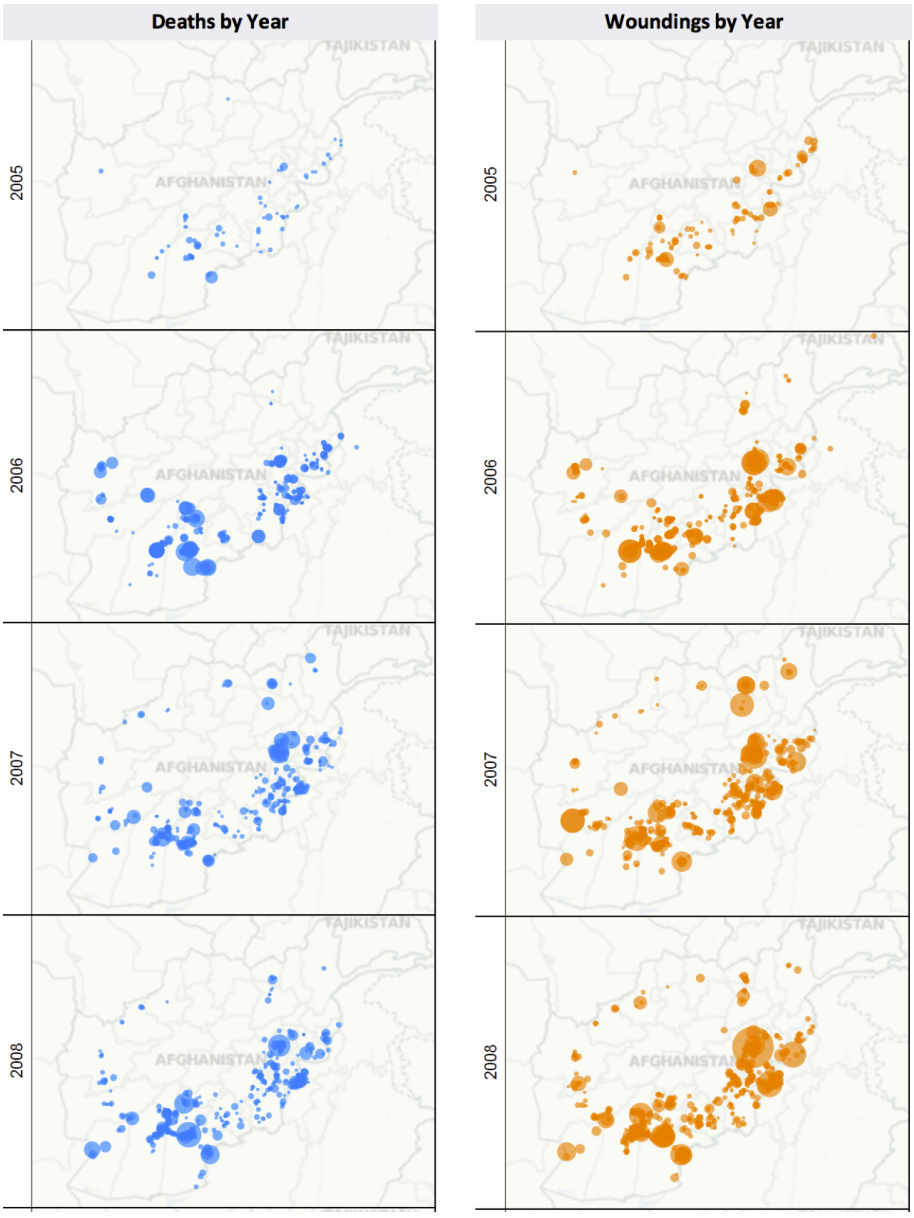


Figure 1.13: **Number of deaths and woundings using the Afghan war diaries (2005-2008)**. *Source: Visualizing data website.*

Finally, [O'Loughlin et al., 2010] compare the conflict figures from the Afghan war diaries with those from the Armed Conflict Location & Event Data Project (ACLED). Figure 1.14 reports the authors figure number 5 where they plot the geographical distribution of the share of violent event data per province with respect to the total number of events. Although data availability in ACLED limits the

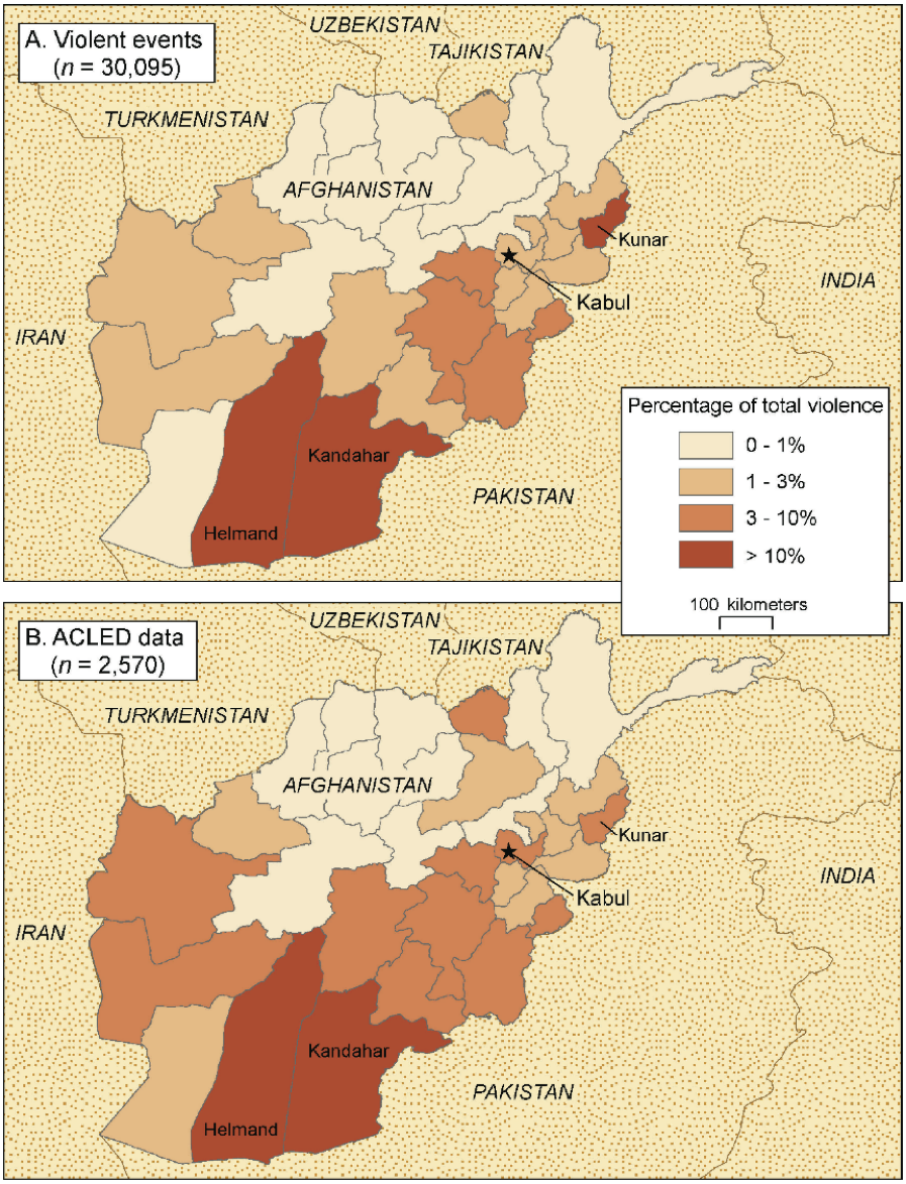


Figure 1.14: **Share of conflict per province with respect to the total number of conflict in the country (2008-2009)**. *The authors use the Afghanistan war diaries and ACLED. The restrictions on the period compared is due to the data availability in ACLED (2008-09). Source: [O'Loughlin et al., 2010]*

comparison to the years 2008 and 2009, the figure shows a strong similarity in the geographical distribution of conflict captured by different data sources. Thus, our specification of the conflict variable has a very similar geographical distribution to the one of different specifications of the conflict variables used by other authors.

Finally, it is shown how the different types of entrepreneurship are correlated with conflict intensity. The district-level relation between the two variables it is plotted in Figure 1.15 for small business owners (top-left), self-employed in the agricultural sector (top-right) and self-employed in the non-agricultural sector (bottom-right). The blue line represents the line of best fit.

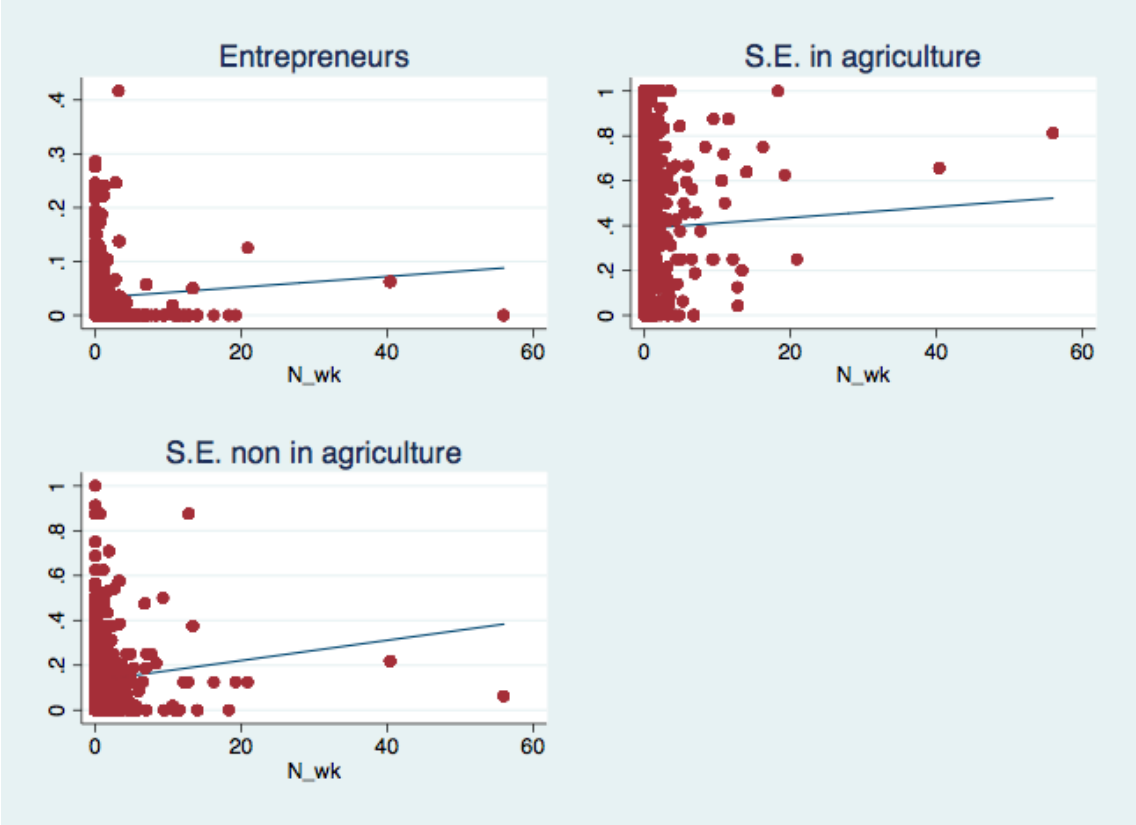


Figure 1.15: **Relationship between the average dependent variable and conflict intensity per district (AWD)**

First, there is no evidence of a linear relation between conflict on entrepreneurship. Second, the figure shows that the three different types may be affected by large levels of conflict in different ways. When agriculture is included, self-employment is at best not affected, although there is an indication of positive relation. Turning to small business and self-employment with the exclusion of agricultural activities, high levels of conflict seem to be correlated with lower level of entrepreneurial activity, in a non linear way: for intermediate levels of conflict intensity the number of entrepreneurs and self-employed do not change from districts with no conflict; for very high levels, though, there are less entrepreneurs and self employed.

Control variables

On top of the intensity, impact, and frequency of the conflict - described in the previous Section - the model specification includes a large number of potential determinants of a household engagement with a PEA.

Table 1.5 describes the variables used in the model specification. The controls are the traditional determinants of entrepreneurial activity widely studied in the literature (Evans and Jovanovic, 1989; Evans and Leighton, 1989, e.g.), such as household features and access to markets (credit, inputs and outputs), geographical features such as infrastructures, institutions, and shocks other than conflict. To proxy for the size of the local market ar also distinguished urban areas from rural ones. To further control for issues related to spatial sorting, the regression controls for the members of the households that migrated in the previous year.

Table 2.7-1.9 show the summary statistics of the variables used in the analysis. The summary statistics show that about 70% of the households used an informal credit source (e.g. relatives, friends, etc.). Almost half of the households in the sample asked for a loan in the previous year, perceived a shock and experienced the migration of a household member (either in another Afghan region or abroad). About 40% of the housolds live close to a market, while more than half of the sample do not have access to electricity. Finally, on average, between 2003-2007/8 Afghan districts were affected by about 0.19 conflicts for every 1000 inhabitants. For 2003 it was possible to match only a subset of the control variables which were comparable with 2005 and 2007/8. All control variables are summarised in Table 1.5, where it is indicated when the variable was computed also for 2003.

Control variables	Description	2003
HHMemb2	= 1 if household members are < 2	Yes
HHMemb5	= 1 if household members are < 5 & > 2	Yes
HHMemb10	= 1 if household members are < 10 & > 5	Yes
HHMemb15	= 1 if household members are < 15 & > 10	Yes
HHMemb20	= 1 if household members are < 20 & > 15	Yes
MaleH	= 1 if the household head is a male	Yes
AgeHH	Age of the household head	Yes
GenderAvHH	Average gender of the household	Yes
LiteracyH	= 1 if the household head is literate	Yes
LiteracyAvHH	Average literacy of the household members	Yes
hhassets	Number of assets in the household	Yes
Rural	= 1 if the household lives in a rural area	No
Credit_Inst	= 1 if the household obtained credit the previous year: credit institution	No
Credit_Lender	= 1 if the household obtained credit the previous year: private lender	No
Credit_Inform	= 1 if the household obtained credit the previous year: informal source	No
Credit_Other	= 1 if the household obtained credit the previous year: other sources	No
Credit_None	= 1 if the household did not obtain credit the previous year	No
Loan	= 1 if the household obtained credit the previous year	No
HHMigration	= 1 if any household member migrated the previous year	Yes
shocks	= 1 if the household experienced a shock in the previous year	Yes
Dremittances	= 1 if the household received remittance the previous year	No
DSocialContr	= 1 if the household received any social aid the previous year	No
RoadKm	Km from the closest road	No
DElectrNo	= 1 if the household has no access to electricity	No
DMkt_Close	= 1 if the household is close to the market	No

Table 1.5: **Control variables availability across waves.**

The relevant choices that were made in order to make the most problematic variables comparable across waves are summarised below.

First, the variable that indicates the number of household assets (*hhassets*) (2003-2007/8), includes the number of households assets which were available in all the three rounds of the survey: radio, bicycle, TV, motorcycle and car.

Second, *shocks* (2003-2007/8), counts only the number of shocks experienced by the households which were asked in all the three rounds of the survey: unusually high level of crops, unusually high level of livestock, earthquakes, landslides, flooding, late damaging frost, hailstorms, unusually high increases in food prices, and unusual decrease in farm gate prices.

Third, the dummy variables that indicates if the household is close to the market or not (*DMkt_Close*, available for 2005-2007/8), computes the presence of a close market differently for 2005 and for 2007/8. For 2005 the dummy is equal to one if either in winter or in the summer the market is in the same village were the interviewed households live, or it takes less than one hour to reach it by foot, public transport, or private vehicle (male shura questionnaire, Section 3). For 2007/8 the

dummy variable is equal to one if the market is in the same village of the interviewed households (male community questionnaire Section 3)

Table 1.6: **Summary statistics (full sample)**

Variable	Mean	Std. Dev.	Min.	Max.	N
2-5 HH Members (Dummy)	0.024	0.153	0	1	48519
5-10 HH Members (Dummy)	0.243	0.429	0	1	48519
10-15 HH Members (Dummy)	0.613	0.487	0	1	48519
15-20 HH Members (Dummy)	0.101	0.301	0	1	48519
> 20 HH Members (Dummy)	0.016	0.127	0	1	48519
Male HH head (Dummy)	0.98	0.14	0	1	46403
Age of the HH head	43.335	13.358	1	99	45993
% of males in the HH	0.693	0.461	0	1	48519
Literacy of HH head (Dummy)	0.183	0.387	0	1	46404
Avg. HH literacy	0.266	0.277	0	1	48496
N. of HH assets	2.356	1.849	0	7	48519
N. of HH assets (squared)	8.968	12.798	0	49	48519
Rural (Dummy)	0.788	0.409	0	1	48311
Credit from Institution (Dummy)	0.009	0.097	0	1	46757
Credit from Lender (Dummy)	0.159	0.366	0	1	46547
Informal source of credit (Dummy)	0.737	0.44	0	1	46757
No Credit (Dummy)	0.073	0.261	0	1	46757
Credit from other source (Dummy)	0.007	0.082	0	1	46757
Loan (Dummy)	0.467	0.499	0	1	48021
Migration of some HH member (Dummy)	0.538	0.499	0	1	48465
Shocks in the previous year (Dummy)	0.488	0.5	0	1	48519
Receipt of remittances (Dummy)	0.061	0.239	0	1	48519
Receipt of social aid (Dummy)	0.009	0.097	0	1	48515
Km from the main road	3.426	13.337	0	602	47455
Km from the main road (squared)	189.594	5312.043	0	362404	47455
Market is nearby (Dummy)	0.404	0.491	0	1	47842
No electricity (Dummy)	0.675	0.468	0	1	47788
Business owner (Dummy)	0.038	0.192	0	1	47343
Self-employed (Dummy)	0.484	0.5	0	1	47343
Self-employed (agric.) (Dummy)	0.353	0.478	0	1	47343
Self-employed (non-agric.) (Dummy)	0.131	0.338	0	1	47343
Low K (Dummy)	0.084	0.277	0	1	47343
High K (Dummy)	0.047	0.212	0	1	47343
Subsistance agric. (Dummy)	0.253	0.434	0	1	47343
Agric. for sale (Dummy)	0.1	0.3	0	1	47343
N. of conflicts (AWD)	0.194	0.636	0	9.273	48393
N. of wounded/killed (AWD)	0.248	0.771	0	11.021	48393
N. of conflicts (GDELT)	0.096	0.321	0	9.73	48401
% of insecurity shocks	0.023	0.063	0	0.704	48519

Table 1.7: **Summary statistics (2003)**

Variable	Mean	Std. Dev.	Min.	Max.	N
2-5 HH Members (Dummy)	0.001	0.035	0	1	11635
5-10 HH Members (Dummy)	0.144	0.351	0	1	11635
10-15 HH Members (Dummy)	0.810	0.392	0	1	11635
15-20 HH Members (Dummy)	0.044	0.204	0	1	11635
$>$ 20 HH Members (Dummy)	0.001	0.032	0	1	11635
Male HH head (Dummy)	0.874	0.332	0	1	10845
Age of HH head	43.83	10.832	1	99	10817
% of males in the HH	0.594	0.491	0	1	11635
Literacy of HH head (Dummy)	0.166	0.372	0	1	10720
Avg. HH literacy	0.212	0.244	0	1	11499
N. of HH assets	0.824	0.885	0	5	11637
N. of HH assets (squared)	1.463	2.615	0	25	11637
Migration of some HH member (Dummy)	0.144	0.352	0	1	11498
Shocks in the previous year (Dummy)	0.64	0.48	0	1	11339
N. of conflicts (GDELT)	0.092	0.321	0	4.865	11464
Business owner (Dummy)	0.02	0.141	0	1	10605
Self-employed (Dummy)	0.405	0.491	0	1	10480
Self-employed (non-agric.)	0.105	0.306	0	1	10480
Self-employed (agric.)	0.328	0.47	0	1	10480

Table 1.8: **Summary statistics for 2005**

Variable	Mean	Std. Dev.	Min.	Max.	N
2-5 HH Members (Dummy)	0.019	0.138	0	1	29087
5-10 HH Members (Dummy)	0.236	0.424	0	1	29087
10-15 HH Members (Dummy)	0.63	0.483	0	1	29087
15-20 HH Members (Dummy)	0.098	0.298	0	1	29087
$>$ 20 HH Members (Dummy)	0.014	0.118	0	1	29087
Male HH head (Dummy)	0.98	0.139	0	1	26972
Age of HH head	43.202	12.803	1	99	26562
% of males in the HH	0.724	0.447	0	1	29087
Literacy of HH head (Dummy)	0.31	0.463	0	1	26972
Avg. HH literacy	0.262	0.281	0	1	29087
N. of HH assets	1.953	1.293	0	6	29087
N. of HH assets (squared)	5.486	6.074	0	36	29087
Rural (Dummy)	0.798	0.401	0	1	29087
Credit from other source (Dummy)	0.009	0.092	0	1	27437
Credit from institution (Dummy)	0.003	0.056	0	1	27437
Credit from lender (Dummy)	0.134	0.341	0	1	27437
Informal source of credit (Dummy)	0.761	0.426	0	1	27437
No Credit (Dummy)	0.088	0.284	0	1	27437
Loan (Dummy)	0.386	0.487	0	1	28599
Migration of some HH member (Dummy)	0.845	0.362	0	1	29087
Shocks in the previous year (Dummy)	0.339	0.473	0	1	29087
Receipt of remittances (Dummy)	0.066	0.248	0	1	29087
Receipt of social aid (Dummy)	0.007	0.086	0	1	29083
Km from the main road	3.691	9.274	0	99	29087
Km from the main road (squared)	99.622	534.371	0	9801	29087
Market is nearby (Dummy)	0.574	0.494	0	1	28410
No electricity (Dummy)	0.74	0.439	0	1	28356
Income	67372.286	79536.213	4	999999	20345
Business owner (Dummy)	0.051	0.219	0	1	27937
Self-employed (Dummy)	0.504	0.5	0	1	27937
Self-employed (agric.)	0.395	0.489	0	1	27937
Self-employed (non-agric.)	0.109	0.311	0	1	27937
Low K	0.064	0.245	0	1	27937
High K	0.044	0.206	0	1	27937
Subsistance agric. (Dummy)	0.291	0.454	0	1	27937
Agric. for sale (Dummy)	0.105	0.306	0	1	27937
N. of conflicts (AWD)	0.05	0.128	0	1.689	29017
N. of wounded/killed (AWD)	0.105	0.477	0	10.694	29017
N. of conflicts (GDELT)	0.055	0.2	0	5.541	29017
% of insecurity shocks	0.022	0.066	0	0.704	29087

Table 1.9: **Summary statistics 2007-2008**

Variable	Mean	Std. Dev.	Min.	Max.	N
2-5 HH Members (Dummy)	0.031	0.172	0	1	19432
5-10 HH Members (Dummy)	0.253	0.435	0	1	19432
10-15 HH Members (Dummy)	0.588	0.492	0	1	19432
15-20 HH Members (Dummy)	0.104	0.305	0	1	19432
$>$ 20 HH Members (Dummy)	0.02	0.14	0	1	19432
Male HH head (Dummy)	0.98	0.141	0	1	19431
Age of HH head	43.516	14.079	4	99	19431
% of males in the HH	0.647	0.478	0	1	19432
Literacy of HH head (Dummy)	0.006	0.077	0	1	19432
Avg. HH literacy	0.27	0.27	0	1	19409
N. of HH assets	2.959	2.33	0	7	19432
N. of HH assets (squared)	14.181	17.562	0	49	19432
Rural (Dummy)	0.772	0.419	0	1	19224
Credit from other source (Dummy)	0.004	0.066	0	1	19320
Credit from institution (Dummy)	0.018	0.134	0	1	19320
Credit from lender (Dummy)	0.196	0.397	0	1	19110
Informal source of credit (Dummy)	0.703	0.457	0	1	19320
No Credit (Dummy)	0.052	0.222	0	1	19320
Loan (Dummy)	0.586	0.493	0	1	19422
Migration of some HH member (Dummy)	0.078	0.267	0	1	19378
Shocks in the previous year (Dummy)	0.711	0.453	0	1	19432
Receipt of remittances (Dummy)	0.053	0.224	0	1	19432
Receipt of social aid (Dummy)	0.012	0.111	0	1	19432
Km from the main road	3.005	17.974	0	602	18368
Km from the main road (squared)	332.07	8509.978	0	362404	18368
Market is nearby (Dummy)	0.156	0.363	0	1	19432
No electricity (Dummy)	0.58	0.494	0	1	19432
Income	62934.947	69956.426	2	1200000	19315
Business owner (Dummy)	0.02	0.141	0	1	19406
Self-employed (Dummy)	0.455	0.498	0	1	19406
Self-employed (agric.)	0.292	0.454	0	1	19406
Self-employed (non-agric.)	0.164	0.37	0	1	19406
Low K	0.112	0.316	0	1	19406
High K	0.052	0.221	0	1	19406
Subsistance agric. (Dummy)	0.198	0.398	0	1	19406
Agric. for sale (Dummy)	0.094	0.291	0	1	19406
N. of conflicts (AWD)	0.41	0.953	0	9.273	19376
N. of wounded/killed (AWD)	0.463	1.033	0	11.021	19376
N. of conflicts (GDELT)	0.158	0.437	0	9.73	19376
perc_ShockInsec	0.025	0.058	0	0.444	19432

1.2.2 Estimation strategy

We estimate a pooled cross-section for 2003/2008 and one for 2005/2008, using the information on the conflict at district level. The analysis is split for the two time periods as, as mentioned above, the data on entrepreneurship from 2005 to 2008 are more detailed

The probability that a household $h \in [1, N]$ holds an activity of one type $i = \{1, 2, 3\}$ is estimated in a given year $t = \{2003, 2005, 2007 - 8\}$, for a level of conflict $Conf$ that changes across districts $d \in [1, 398]$:

$$Y_{hdt} = \alpha + \beta Conf_{hdt} + \eta year_t + \delta district_d + \gamma X_{hdt} + u_{hdt} \tag{1.1}$$

Where, Y is the private economic activity dummy, $Conf$ is the conflict indicator (number of wounded/killed per district), X are other determinants of private economic activity and u is the residual error. In the equation above year fixed effects capture macro influences on both entrepreneurship and S.E., while district fixed effects capture geographic-specific influences on the dependent variables. The equation is estimated clustering standard errors at the district level in order to control for the group correlation of the error term caused by measuring conflict at the district level.

1.2.3 Identification strategy

As discussed earlier, the potential bias due to omitted variables and measurement error has to be addressed. Other studies in the current literature used instrumental variable strategies.

Collier and Duponchel [2013] study geographical variations in the intensity of conflict across chiefdoms to estimate the impact of violence on firms in Sierra Leone, a country that was ravaged by violent conflict from 1991 to 2002. They instrument the intensity of conflict using the distance to Monrovia from the epicenter of the chiefdom in kilometers. The assumption is that the closer to Liberian capital the chiefdom is, the more intense the conflict. On the contrary, distance from Monrovia should not impact the dependent variables because the lacks of infrastructures (poor

roads) and adverse weather conditions.

Camacho and Rodriguez [2013] evaluate the effect that armed conflict measures have on entrepreneurial activities in Colombia and Bozzoli et al. [2013], study the impact of violent conflict on self-employment and they use different instruments that vary across time and municipality levels. They both use as instruments lagged laboratories dismantle and antinarcotics operations at the municipality level . The exogeneity of the instrument is proved by a Sargan test.

Bozzoli et al. [2013] also use the instrument found by Rodriguez and Sanchez [2012] in their study about the impact of conflict on child labour in Colombia.They use an indicator of central government deterrence measures: (lag) the rate of homicide captures10 at the state level, interacted with the respective municipal population. The instrument is valid if homicide captures are not directly correlated with labor market outcomes. This is plausible since, it is argued, that deterrence decisions are under "central government control (the Ministry of Defense)."

As discussed earlier, in this study the potential bias due to omitted variables, is addressed controlling for a large number of different PEA activities and conflict measures, and for household and district controls and districts fixed effects. However a time-variant instrumental variable (IV) is also used in a two-stages least square (2SLS) estimation. In this section are given details of how the instrument is constructed.

The instrumental strategy is inspired by the so-called “shift-share” methodology used in urban and regional economics to instrument regional economic growth, at least since Bartik [1991] and Blanchard and Katz [1992]. In both papers, the authors instrument regional economic growth interacting the lagged regional sectoral structure with the contemporaneous national sectoral trend. A similar methodology has also been widely used in the migration literature to instrument local migration flows. Here researchers interact the lagged ethnic enclaves with the contemporaneous nation-wide flows of ethnic groups [Altonji and Card, 1991a, Bartel, 1989, Saiz, 2007].

Following the “shift-share” approach, the district share of total conflict per district between 1979 and 1989 (the conflict during the Soviet occupation) ($Share_{0d}$), is interacted with the contemporaneous (i.e. 2003-2008) nationwide number of conflict

events ($Global\_Conf_t$):

$$Share_{0d} = Conf_{0d}/Global\_Conf_0 \tag{1.2}$$

$$iv1_{td} = Share_{0d} * Global\_Conf_t \tag{1.3}$$

where $Conf_{0d}$ is the number of district-level conflicts in time 0 in district d, $Global\_Conf$ is the number of nationwide level conflicts in time 0 and time t, the index 0 refers to the pre-sample period (1979-1989), and the index t represents the years of our analysis t=[2003, 2005, 2007/8].

In order to instrument for conflict the instrumental variable has to be strongly correlated with the district-level variation over time in conflict intensity (relevance condition) and, at the same time, it has to be properly excluded from the second stage regression, i.e., it should affect PEA only through its effect on the conflict intensity variable, not directly (exogeneity or exclusion condition).

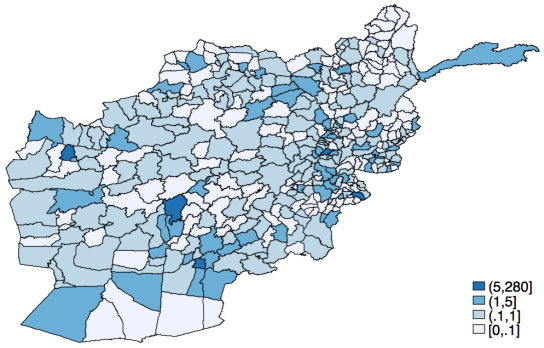
The relevance of the instrument (the first stage-correlation), is measured by the magnitude of the F-tests available in Panel A of the tables in Section 1.3, which is safely above 10. This suggests that past conflict shares might be correlated with the current ones because of exogenous geographical factors (such as accessibility, position, etc.). These factors make a given district more or less likely to be affected by conflict events where the overall conflict intensity in the whole country increases.

Figure 1.16a and Figure 1.16b below provide evidence of the correlation between the Taliban and the Russian conflict. In order to build up the IV used in the regressions are used the GDELT data. In particular events related to conflict are classified as material cooperation, verbal cooperation, verbal conflict and material conflict. In order to use as an IV the district level of conflict intensity from 1979 to 1989 it is used a sum of all these geo-referenced events.

Although the two conflicts were completely different, they both spread throughout the whole country. Figure 1.16 below shows the average number of conflicts per district over the periods of interest for the Soviet conflict (1.16a) and for the conflict studied in this paper (data between 2004 and 2009) (1.16b). Due to differences in reporting between 30 years ago and recent years (e.g. because of differences in

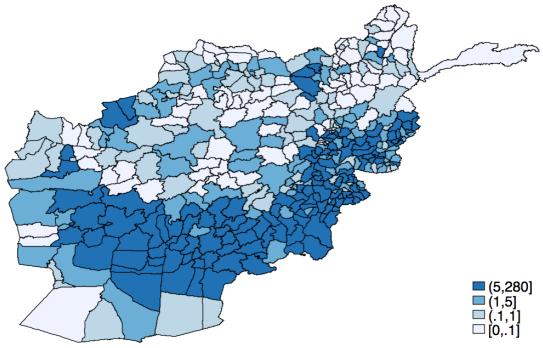
the media coverage), the overall number of conflicts registered is clearly different. However, the figure shows that both conflicts were spread throughout the country, although the average intensity might differ between districts. The fact that the two conflicts, on average, cover similar districts with similar intensity is confirmed by a significant Spearman's correlation coefficient of 0.41 between the number of events per district in the two periods. Finally, Figure 1.16c plots the routes of the Soviet invasion, which follows the main trade route/highway in Afghanistan and it is remarkably close to the belt of strongest conflict plot in Figure 1.16a.

In order for the instrument to be valid, also the exclusion restriction has to be satisfied. It is realistic assuming that the exclusion restriction holds in this context because the Soviet invasion took place thirty years before the period of our analysis and the Afghan economy has gone through many structural changes since then. In particular, the surge of illecit opium activities and cross-border trade with the arise of the Talibans and the cease of the production of natural gas after the Russian occupation (see the discussion in Section 1.1.2) provide clear examples of how private economic activity between 1979 should not be correlated with PEA in 2003-2008 if not through observable fixed factor that are controlled for in the estimation strategy.



(a) Soviet conflict (1979-1989)

Source: own computation based on GDELT data.



(b) ISAF conflict (2004-2009 only)

Source: own computation based on AWD data.

(c) US Map of Soviet Invasion in Afghanistan

Source: Braithwaite [2011]

Figure 1.16: **Geographical distribution of the Soviet (a-c) and the ISAF conflicts (b).** *Maps 1.16a and 1.16b plot the averge number of relevant conflict events in each district (post-2005 definitions of districts) during the periods of interest: 1979-1989 for the Soviet conflict (a) and 2004-2004 for the ISAF conflict (b). Due to differences in reporting between 30 years ago and recent years, the overall number of conflicts registered is clearly different. However, the figure shows that both conflicts were spread throughout the country, although the average intensity might differ between districts. Map 1.16a plots the Soviet invasion route, covering an area that is quite similar to the ISAF conflict belt in Figure 1.16b.*

Fourth, as suggested by Zammit-Mangion et al. [2012] the volatility of the conflict within provinces is quite high, suggesting that it is difficult to identify trends. On the contrary, the "irregular warfare" observed can be predicted, only because random effects cancel out, showing a Gaussian distribution of the conflict's intensity.

1.3 Results

Table 1.10 and 1.11 show the results from a Linear Probability Model (LPM) and an IV estimation of the effect of conflict intensity on PEA measured with both AWD data on the different types of entrepreneurship using the pooled data from 2005 and 2007-2008 and clustering by district level. The IV results from the second stage equation are presented in panel B of Table 1.10 and 1.11 in columns 3, 6, 9 and 12.

The first stages reported in the tables in panel A of both tables confirm both the positive correlation between the Russian conflict between 1979-1989 and the Taliban conflict in 2005-2007/8 and the validity of the instrument as the F-test is safely above 10. The IV estimates in Table 1.10, column 6, show that a unitary increase in the conflict intensity measure (one conflict over 1000 inhabitants) increases the probability of a household of being self-employed of about 21.5 percentage points (about 36 standard deviations of the conflict variable). When a distinction is made between agricultural and non-agricultural self-employment the probability of an household of engaging in agricultural self-employment increases about 16 percentage points. Table 1.11 column 3, shows that among non-agricultural self-employment activities the probability of an household of engaging in a low capital intensive activity increases about 9.6 percentage points with a unitary increase in conflict intensity versus an increase of about 6.4 percentage points in high capital intensive activities. However, given the size of the standard errors these coefficients are not statistically different from each other. A unitary increase of conflict intensity also causes an increase of about 5.5 percentage points in agriculture for sale while it also increases subsistence agriculture, but not significantly. Overall, the results show that Afghan households respond to an increase in conflict intensity in the district increasing non-agricultural activities, especially those which require lower capital investments.

The 2SLS coefficients are generally larger than those presented in the LPM re-

gressions.This may be due to omitted variables, as well as to an "attenuation bias". Concerning omitted variables, good candidates for omitted variables are household wealth (not well accounted for by the number of assets), natural resources, and, with a less clear effect, in-migration (both internal immigrants from other districts or from other countries). Higher household wealth is positively correlated with higher capital intensive investments and possibly with conflict targeting, but negatively correlated with subsistence agriculture. Similarly, a large presence of natural resources attracts both higher capital intensive investments, and conflict, and is likely to reduce land for subsistence agriculture. Finally, migrants are more likely to take up subsistence jobs, rather than investing in higher capital intensive activities; and people will tend to migrate where there is less conflict. However, it is not clear if areas characterised by less migration are more likely to host higher capital investors or subsistence farmers. Other behavioural unobservables, which may relate to both the source of income and to the level of conflict, such as risk preferences, are not good candidates to explain the LPM bias. Indeed, risk aversion is negatively correlated with capital investment and positively with the level of conflict.

However, the explanation of the "attenuation bias" of the 2SLS estimates can be simply related to the independence of the measurement error of the district-level conflict for the endogenous variable and for the instrument. Given that the information on the conflict level during the Russian conflict (used to construct the instrument) and the most recent conflict level (instrumented) comes from two completely different datasets, it is likely that the measurement error components potentially affecting both variables are mutually independent. This is the necessary condition to make the 2SLS estimates consistent in presence of well-behaved measurement errors.

However, it is worth noticing that the differences between the two sets of estimates – LPM and 2SLS – are small and not always significant, which suggests that the measurement error – as well as other sources of bias – does not affect the main conclusions of the analysis. Overall, the instrumental variable estimations suggest that the LPM results should be considered to be a conservative or lower-bound estimate of the true effect. Table 1.25 and 1.31 in the Appendix show also the impact on the probability of the household of engaging in PEA of other covariates at the household level.

Table 1.12 shows the LPM estimation of an increase in conflict intensity on the main activity of the household using pooled data from 2003 and 2008 using as a measure of conflict the material conflict events reported in the GDELT dataset, while Table 1.13 shows the LPM estimation of an increase of the percentage of insecurity shocks perceived by the households in the district. Both the conflict indicators seem to have no significant effect on the probability of the household of engaging in PEA. The reason could be that the stimates which include also 2003 rely on variables that were harmonised across surveys. Despite all the efforts to make the survey waves comparable, the variable could be not homogeneous causing the difference with respect to the coefficients of the 2005/2007-8 analysis. The coefficients of Table 1.13 instead could not be significant because insecurity shocks do not necessarily involve wounded/killed or conflict events that destroy infrastructures. This could explain the difference with respect to the previous results, where the conflict variable was capturing conflict events causing damage either to individuals or infrastructures.

The results are also fairly smilar when using a different measure of conflict: the total number of wounded and killed per district normalised by district population (N_wk). This conflict measure does not keep into account the destruction of the infrastructures, but measures its magnitude as its impact on individuals (both soldiers and civilians). Table 1.14 ishows a significant increase in non-agricultural self-employment (column 9) and in 1.15 a positive increase in both high and low capital intensive self-employed activities (columns 3 and 6). These results also suggest that the impact of conflict on PEA is not just due to the presence of conflict and its impact on infrastructures, but also to the impact of conflict on human lives. However, the magnitudes of the coefficients of interest are smaller when looking just at the impact of the number of wounded and killed by district. The difference in the magnitude of the results suggests that part of the impact of conflict of entrepreneurship is due partly to the distruction of infrastructures such as transports, shops etc. and partly to the impact it has on human lives. Panel A of both Tables 1.14 and 1.15 show the first stage of the IV regressions. The correlation between the Russian conflict and the number of wounded and killed per district in 2005-2007/8 is positive. The F-test is above ten, showing that again, the IV is valid. This F-test is significantly larger than the one in Table 1.10 and 1.11.

Table 1.10: **Pooled data 2005/2008, (AWD) (1)**

PANEL A (first stage)												
VARIABLES			N_conflict			N_conflict			N_conflict			N_conflict
iv			0.9048**			0.9048**			0.9048**			0.9048**
			0.2162			0.2162			0.2162			0.2162
F-test			17.47			17.47			17.47			17.47
PANEL B												
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	(LPM)	(LPM)	(IV)	(LPM)	(LPM)	(IV)	(LPM)	(LPM)	(IV)	(LPM)	(LPM)	(IV)
VARIABLES	bus_own	bus_own	bus_own	se_hh	se_hh	se_hh	se_nag	se_nag	se_nag	agric	agric	agric
N_conflict	0.00308	0.00406	0.0131	0.0136	0.0109	0.215**	-0.00627	-0.0117**	0.160***	-0.0243	-0.0177	0.0577
	(0.00275)	(0.00280)	(0.0201)	(0.00968)	(0.00977)	(0.0968)	(0.00411)	(0.00495)	(0.0523)	(0.0161)	(0.0154)	(0.0987)
Controls	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Year F.E.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
District F.E.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	40,957	40,957	40,957	40,957	40,957	40,957	40,957	40,957	40,957	40,957	40,957	40,957
R-squared	0.053	0.059	0.006	0.111	0.132	-0.025	0.110	0.136	-0.025	0.235	0.267	0.036

Notes: Cluster robust standard errors in parentheses, the cluster is the district d.
*** p<0.01, ** p<0.05, * p<0.1
The dependent variables are dummy variables defined at the household level specifying the type of activity of the household (see Table 1.3 for definitions).
conflict measures are computed at the district level and are normalised by population. A unit of conflict is 1/1000 inhabitants (see Table 1.4 for definitions).
All equations are estimated with the control variables described in Table 1.5, year and district fixed effects.

Table 1.11: **Pooled data 2005/2008, (AWD) (2)**

PANEL A (first stage)												
VARIABLES			N_conflict			N_conflict			N_conflict			N_conflict
iv			0.9048			0.9048			0.9048			0.9048
			0.2162			0.2162			0.2162			0.2162
F-test			17.47			17.47			17.47			17.47
PANEL B												
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	(LPM)	(LPM)	(IV)	(LPM)	(LPM)	(IV)	(LPM)	(LPM)	(IV)	(LPM)	(LPM)	(IV)
VARIABLES	Low_K	Low_K	Low_K	High_K	High_K	High_K	sub_agr	sub_agr	sub_agr	agric_sale	agr_sale	agr_sale
N_conflict	-0.00660**	-0.0112***	0.0962***	0.000331	-0.000405	0.0639**	-0.0442***	-0.0403***	0.00299	0.0199**	0.0226***	0.0548
	(0.00261)	(0.00323)	(0.0316)	(0.00317)	(0.00306)	(0.0309)	(0.0134)	(0.0128)	(0.148)	(0.00858)	(0.00868)	(0.0643)
Controls	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Year F.E.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
District F.E.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	40,957	40,957	40,957	40,957	40,957	40,957	40,957	40,957	40,957	40,957	40,957	40,957
R-squared	0.088	0.107	-0.010	0.050	0.058	-0.010	0.239	0.258	0.026	0.165	0.174	0.009

Notes: Cluster robust standard errors in parentheses, the cluster is the district d.
*** p<0.01, ** p<0.05, * p<0.1
The dependent variables are dummy variables defined at the household level specifying the type of activity of the household (see Table 1.3 for definitions).
conflict measures are computed at the district level and are normalised by population. A unit of conflict is 1/1000 inhabitants (see Table 1.4 for definitions).
All equations are estimated with the control variables described in Table 1.5, year and district fixed effects.

Table 1.12: **Pooled data 2003/2008, (AWD)**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	(LPM)	(LPM)	(LPM)	(LPM)	(LPM)	(LPM)	(LPM)	(LPM)
VARIABLES	bus_own	bus_own	se_hh	se_hh	se_nagric	se_nagric	se_agric	se_agric
N_event4	0.00199	0.00451	-0.0189	-0.0227	-0.0119	-0.0212	-0.00610	-0.000978
	(0.00792)	(0.00755)	(0.0405)	(0.0388)	(0.0198)	(0.0208)	(0.0404)	(0.0370)
Controls	No	Yes	No	Yes	No	Yes	No	Yes
Year F.E.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
District F.E.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	54,201	54,201	54,201	54,201	54,201	54,201	54,201	54,201
R-squared	0.045	0.048	0.107	0.126	0.091	0.100	0.192	0.207

Notes: Cluster robust standard errors in parentheses, the cluster is the district d.
*** p<0.01, ** p<0.05, * p<0.1
The dependent variables are dummy variables defined at the household level specifying the type of activity of the household (see Table 1.3 for definitions). conflict measures are computed at the district level and are normalised by population. A unit of conflict is 1/1000 inhabitants (see Table 1.4 for definitions). All equations are estimated with the control variables described in Table 1.5, year and district fixed effects.

Table 1.13: **Pooled data 2003/2008 (NRVA)**

VARIABLES	(1) (LPM) bus_own	(2) (LPM) bus_own	(3) (LPM) se_hh	(4) (LPM) se_hh	(5) (LPM) se_nagric	(6) (LPM) se_nagric	(7) (LPM) se_agric	(8) (LPM) se_agric
perc_ShockInsec	-0.0219	-0.00968	0.0890	0.0279	-0.0556	-0.0316	0.141	0.0563
	(0.0331)	(0.0328)	(0.198)	(0.199)	(0.0843)	(0.0843)	(0.201)	(0.194)
Controls	No	Yes	No	Yes	No	Yes	No	Yes
Year F.E.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
District F.E.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	54,201	54,201	54,201	54,201	54,201	54,201	54,201	54,201
R-squared	0.045	0.048	0.107	0.126	0.091	0.100	0.192	0.207

Notes: Cluster robust standard errors in parentheses, the cluster is the district d.
*** p<0.01, ** p<0.05, * p<0.1
The dependent variables are dummy variables defined at the household level specifying the type of activity of the household (see Table 1.3 for definitions). conflict measures are computed at the district level and are normalised by population. A unit of conflict is 1/1000 inhabitants (see Table 1.4 for definitions). All equations are estimated with the control variables described in Table 1.5, year and district fixed effects.

Table 1.14: **Pooled data 2005/2008, (AWD) (1)**

PANEL A (first stage)												
VARIABLES			N_wk			N_wk			N_wk			N_wk
iv			.1286			.1286			.1286			.1286
			.0170			.0170			.0170			.0170
F-test			56.77			56.77			56.77			56.77
PANEL B												
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	(LPM)	(LPM)	(IV)	(LPM)	(LPM)	(IV)	(LPM)	(LPM)	(IV)	(LPM)	(LPM)	(IV)
VARIABLES	bus_own	bus_own	bus_own	se_hh	se_hh	se_hh	se_nag	se_nag	se_nag	agric	agric	agric
N. of wounded and killed	0.00293	0.00352	0.00923	0.0178*	0.0134	0.151*	0.000975	-0.00537	0.112***	-0.0146	-0.00908	0.0406
	(0.00261)	(0.00262)	(0.0149)	(0.00922)	(0.00942)	(0.0824)	(0.00590)	(0.00616)	(0.0435)	(0.0137)	(0.0130)	(0.0665)
Controls	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Year F.E.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
District F.E.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	40,957	40,957	40,957	40,957	40,957	40,957	40,957	40,957	40,957	40,957	40,957	40,957
R-squared	0.053	0.059	0.006	0.111	0.132	0.001	0.110	0.136	0.003	0.235	0.267	0.039

Notes: Cluster robust standard errors in parentheses, the cluster is the district d.
*** p<0.01, ** p<0.05, * p<0.1
The dependent variables are dummy variables defined at the household level specifying the type of activity of the household (see Table 1.3 for definitions).
conflict measures are computed at the district level and are normalised by population. A unit of conflict is 1/1000 inhabitants (see Table 1.4 for definitions).
All equations are estimated with the control variables described in Table 1.5, year and district fixed effects.

Table 1.15: **Pooled data 2005/2008, (AWD) (2)**

PANEL A (first stage)												
VARIABLES			N_wk			N_wk			N_wk			N_wk
iv			.1286			.1286			.1286			.1286
			.0170			.0170			.0170			.0170
F-test			56.77			56.77			56.77			56.77
PANEL B												
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	(LPM)	(LPM)	(IV)	(LPM)	(LPM)	(IV)	(LPM)	(LPM)	(IV)	(LPM)	(LPM)	(IV)
VARIABLES	Low_K	Low_K	Low_K	High_K	High_K	High_K	sub_agr	sub_agr	sub_agr	agr_sale	agr_sale	agr_sale
N. of wounded and killed	-0.00139	-0.00645	0.0676**	0.00236	0.00108	0.0449**	-0.0314**	-0.0279**	0.00210	0.0168*	0.0188**	0.0385
	(0.00475)	(0.00481)	(0.0275)	(0.00377)	(0.00359)	(0.0227)	(0.0134)	(0.0127)	(0.104)	(0.00872)	(0.00920)	(0.0491)
Controls	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Year F.E.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
District F.E.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	40,957	40,957	40,957	40,957	40,957	40,957	40,957	40,957	40,957	40,957	40,957	40,957
R-squared	0.088	0.107	0.006	0.050	0.058	-0.000	0.238	0.258	0.026	0.165	0.174	0.010

Notes: Cluster robust standard errors in parentheses, the cluster is the district *d*.
*** p<0.01, ** p<0.05, * p<0.1
The dependent variables are dummy variables defined at the household level specifying the type of activity of the household (see Table 1.3 for definitions).
conflict measures are computed at the district level and are normalised by population. A unit of conflict is 1/1000 inhabitants (see Table 1.4 for definitions).
All equations are estimated with the control variables described in Table 1.5, year and district fixed effects.

1.3.1 Heterogeneous effects

Table 1.16 and Table 1.17 show the IV estimates of the impact of conflict on the different types of entreprenurial activity on heterogeneus households, distinguishing between female headed and household headed ones. The results show that the impact of conflict is heterogeneous across households with heads of a different sex. In female headed households, shown in Table 1.16, an additional unit of conflict significantly decreases the probability that the household is engaged in a self-employed activity of about 1.2 percentage points, see column 2. In particular, the probability that a household is engaged as a main activity in low capital intensive activities decreases of about 78 percentage points at a 10% level of significance. On the contrary, in male headed households, shown in Table 1.17 an additional unit of conflict increases the probability of a household of being mainly engaged in self-employement of 21 percentage points. In particular, the probability of being engaged in non-agricultural self-employment increases of 16 percentage points. The probability of a household of being engaged both in low and in high capital intensive activities increases, respectively of 9 and 6 percentage points.

The results suggest that under higher conflict intensity, female headed households reduce informal entrepreneurial (self-employement) activities. The policy implications of these results point in the direction of subsidizing/providing aid to female-headed households, which activity seems to be more disrupted by higher conflict intensity.

Table 1.16: **IV estimates, pooled data 2005/2008 (NRVA) - Female household head**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	(IV)	(IV)	(IV)	(IV)	(IV)	(IV)	(IV)	(IV)
VARIABLES	bus_own	se_hh	se_nag	agric	Low_K	High_K	sub_agr	agr_sale
N_conflict	-0.486	-1.208**	-0.553	-1.439	-0.784*	0.231	-0.784	-0.655
	(0.360)	(0.577)	(0.393)	(1.952)	(0.452)	(0.260)	(1.948)	(0.483)
Observations	809	809	809	809	809	809	809	809
R-squared	-0.183	-0.579	-0.087	-1.188	-0.396	-0.001	-0.452	-0.668

Notes: Cluster robust standard errors in parentheses, the cluster is the district *d*.
*** p<0.01, ** p<0.05, * p<0.1
The dependent variables are dummy variables defined at the household level specifying the type of activity of the household (see Table 1.3 for definitions). conflict measures are computed at the district level and are normalised by population. A unit of conflict is 1/1000 inhabitants (see Table 1.4 for definitions). All equations are estimated with the control variables described in Table 1.5, year and district fixed effects.

Table 1.17: **IV estimates, pooled data 2005/2008 (NRVA) - Male household head**

	(1) (IV)	(2) (IV)	(3) (IV)	(4) (IV)	(5) (IV)	(6) (IV)	(7) (IV)	(8) (IV)
VARIABLES	bus_own	se_hh	se_nag	agric	Low_K	High_K	sub_agr	agr_sale
N_conflict	0.0125	0.217**	0.162***	0.0563	0.0985***	0.0639**	0.00198	0.0544
	(0.0203)	(0.0969)	(0.0526)	(0.0977)	(0.0320)	(0.0307)	(0.147)	(0.0640)
Observations	40,148	40,148	40,148	40,148	40,148	40,148	40,148	40,148
R-squared	0.006	-0.026	-0.027	0.035	-0.011	-0.010	0.025	0.009

Notes: Cluster robust standard errors in parentheses, the cluster is the district d.
*** p<0.01, ** p<0.05, * p<0.1
The dependent variables are dummy variables defined at the household level specifying the type of activity of the household (see Table 1.3 for definitions). conflict measures are computed at the district level and are normalised by population. A unit of conflict is 1/1000 inhabitants (see Table 1.4 for definitions). All equations are estimated with the control variables described in Table 1.5, year and district fixed effects.

1.3.2 Mechanisms

The mechanisms that could explain an increase in PEA, especially in non-agricultural self-employment could be those listed in the diagram in figure . First, households could shift their main activity from wage employment to self-employment. Table 1.18 shows that that the probability of an household main activity of being wage employment decreases of about 17 percentage points when our measure of conflict goes up by one unit.

Also, as conflict intensity increases, households could engage more in lower capital intensive activities as insecurity could make investments riskier. Table 1.11 Column 3, shows that households have a higher probability of being engaged in low capital intensive activities of 9.6 percentage points.

Finally, households might decrease their investments in agriculture and consequently increase non-agricultural self-employed activities. Table 1.19 shows the impact of conflict intensity respectively on the number of livestock, the number of tractors and threshers and the dummy variable that identifies households who own land. However, the results show that the impact of conflict is not significant.

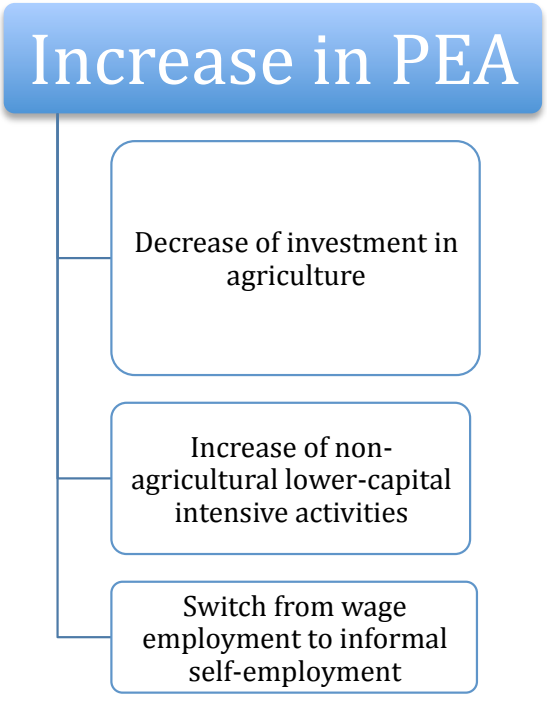


Figure 1.17: **Mechanisms**

Table 1.18: **IV estimates, pooled data 2005/2008 (NRVA) - Impact of an increase of conflict intensity on wage income**

	(IV)
VARIABLES	Wage Income
N_conflict_dis	-0.177***
	(0.0660)
Observations	40,957
R-squared	0.007

Notes: Cluster robust standard errors in parentheses, the cluster is the district d.
*** p<0.01, ** p<0.05, * p<0.1
The dependent variables are dummy variables defined at the household level specifying the type of activity of the household (see Table 1.3 for definitions). conflict measures are computed at the district level and are normalised by population. A unit of conflict is 1/1000 inhabitants (see Table 1.4 for definitions). All equations are estimated with the control variables described in Table 1.5, year and district fixed effects.

Table 1.19: **IV estimates, pooled data 2005/2008 (NRVA) - Impact of an increase of conflict intensity on investment in agricultural assets owned by households engaged in agriculture**

	(1)	(2)	(3)
	(IV)	(IV)	(IV)
VARIABLES	N. of livestock	N. of tractors and threshers	Land ownership
N_conflict_dis	-1.760	0.0150	0.0366
	(4.039)	(0.0302)	(0.0522)
Observations	14,402	14,402	14,402
R-squared	0.028	0.713	0.017

Notes: Cluster robust standard errors in parentheses, the cluster is the district *d*.

*** p<0.01, ** p<0.05, * p<0.1

The dependent variables are dummy variables defined at the household level specifying the type of activity of the household (see Table 1.3 for definitions). conflict measures are computed at the district level and are normalised by population. A unit of conflict is 1/1000 inhabitants (see Table 1.4 for definitions). All equations are estimated with the control variables described in Table 1.5, year and district fixed effects.

1.3.3 Robustness checks

Tables 1.20, 1.21 below show that the results of the analysis are fairly robust to the exclusion of the district of Kabul from the sample. In the district that includes the capital of Afghanistan conflict intensity is much higher than the average across districts (159.2 conflict events in the district versus 25.92 conflict events on average in the other districts [16]). Thus, it could be an outlier driving the results. A few differences in the IV coefficients can be noticed both for subsistance agriculture, agriculture for sale and non-agricultural self-employment. When excluding the district of Kabul, even if conflict still has a positive impact on the probability of the household of engaging in agricultural self-employment (Table 1.20, column 12), it is not possible to distinguish if this increase is due to more subsistance agriculture or to more agriculture for sale (Table 1.21, column 9 and 12).

Also, the impact of conflict on non-agricultural self-employment is positive, but not significant (Table 1.20, column 9). The reason seems to be the loss of significance of the coefficient on high capital intensive self-employment activities. Thus, the results suggest that once the district of Kabul is excluded, where conflict intensity is above the average, the positive impact of conflict on subsistance agriculture, agriculture for sale in high capital intensive activities is not significant anymore.

[16] before normalising the conflict measure by population per district

Table 1.20: **Pooled data 2005/2008, Kabul district excluded, (AWD) (1)**

PANEL A (first stage)												
VARIABLES			N_conflict			N_conflict			N_conflict			N_conflict
iv			.0884			.0884			.0884			.0884
			.0392			.0392			.0392			.0392
F-test			17.47			17.47			17.47			17.47
PANEL B												
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	(LPM)	(LPM)	(IV)	(LPM)	(LPM)	(IV)	(LPM)	(LPM)	(IV)	(LPM)	(LPM)	(IV)
VARIABLES	bus_own	bus_own	bus_own	se_hh	se_hh	se_hh	se_nag	se_nag	se_nag	agric	agric	agric
N_conflict	0.00346	0.00445	0.0158	0.0136	0.0116	0.220**	-0.0223	-0.0165	0.0764	-0.00664	-0.0112**	0.161***
	(0.00279)	(0.00281)	(0.0211)	(0.00973)	(0.00985)	(0.102)	(0.0161)	(0.0153)	(0.0928)	(0.00413)	(0.00498)	(0.0540)
Controls	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Year F.E.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
District F.E.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	38,292	38,292	38,292	38,292	38,292	38,292	38,292	38,292	38,292	38,292	38,292	38,292
R-squared	0.058	0.064	0.006	0.119	0.139	-0.032	0.210	0.243	0.034	0.112	0.138	-0.033

Notes: Cluster robust standard errors in parentheses, the cluster is the district *d*.
*** p<0.01, ** p<0.05, * p<0.1
The dependent variables are dummy variables defined at the household level specifying the type of activity of the household (see Table 1.3 for definitions).
conflict measures are computed at the district level and are normalised by population. A unit of conflict is 1/1000 inhabitants (see Table 1.4 for definitions).
All equations are estimated with the control variables described in Table 1.5, year and district fixed effects.

Table 1.21: **Pooled data 2005/2008, Kabul district excluded, (AWD) (2)**

PANEL A (first stage)												
VARIABLES			N_conflict			N_conflict			N_conflict			N_conflict
iv			.0884			.0884			.0884			.0884
			.0392			.0392			.0392			.0392
F-test			17.47			17.47			17.47			17.47
PANEL B												
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	(LPM)	(LPM)	(IV)	(LPM)	(LPM)	(IV)	(LPM)	(LPM)	(IV)	(LPM)	(LPM)	(IV)
VARIABLES	Low_K	Low_K	Low_K	High_K	High_K	High_K	sub_agr	sub_agr	sub_agr	agr_sale	agr_sale	agr_sale
N_conflict	-0.00616**	-0.0105***	0.101***	-0.000479	-0.000728	0.0599*	-0.0426***	-0.0393***	0.0175	0.0202**	0.0228***	0.0589
	(0.00262)	(0.00324)	(0.0348)	(0.00308)	(0.00300)	(0.0312)	(0.0134)	(0.0128)	(0.144)	(0.00860)	(0.00869)	(0.0675)
Controls	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Year F.E.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
District F.E.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	38,292	38,292	38,292	38,292	38,292	38,292	38,292	38,292	38,292	38,292	38,292	38,292
R-squared	0.093	0.114	-0.015	0.051	0.059	-0.011	0.223	0.244	0.024	0.160	0.170	0.009

Notes: Cluster robust standard errors in parentheses, the cluster is the district *d*.
*** p<0.01, ** p<0.05, * p<0.1
The dependent variables are dummy variables defined at the household level specifying the type of activity of the household (see Table 1.3 for definitions). conflict measures are computed at the district level and are normalised by population. A unit of conflict is 1/1000 inhabitants (see Table 1.4 for definitions). All equations are estimated with the control variables described in Table 1.5, year and district fixed effects.

1.4 Concluding Remarks

Entrepreneurship is a crucial driver of economic development and growth, both in developing and in industrialized economies. Violent conflict, conversely, is a clear obstacle to economic development and growth, particularly in countries ragged by several decades of conflict such as Afghanistan.

International organisations and aid agencies may be interested in knowing more about which kind of entrepreneurship is more resilient towards the obstacles that conflict and insecurity set on economic activities, as it could work as leverage for economic development, during and in the aftermath of wars. Similarly they might be interested in which aspects of the conflict plays the biggest role in hindering PEA – e.g. the intensity, frequency or the impact on infrastructures and people lives.

However, the evidence of the empirical economic literature so far is, at best, mixed. This is the case also because large part of the studies consider a generic entrepreneurial activity, when they focus on the households, or formal firms; and they control for one specific indicator of conflict, usually the impact in terms of number casualties.

This study is based on a detailed and comprehensive dataset to carefully investigate the relation between conflict and PEA in the context of Afghanistan. Two unique sources of information are matched– with a detail of precision along many different dimension (type of economic activity, household background information, and type of conflict events) and a comprehensiveness which are extremely rare in a developing country. The dataset enabled to assess how the households' choices with respect to the source of income are affected by the conflict intensity in the area in which they live. This chapter focused on the choice to hold one type of private economic activity.

The results show that the probability that a household engages in PEA is, in general, positively affected by the level of conflict. However, the results are heterogeneous with respect to the type of activity and the conflict indicator used.

Indeed, it is mainly less capital-intensive self-employment activities – e.g. sales of prepared food and petty trade, which drive the positive relationship. More capital-intensive self-employment activities requiring higher fixed capital investments – e.g.

milling and taxi driving – are less positively affected by the intensity of the conflict.

All these results are remarkably stable across a number of different specifications and robustness tests, and an instrumental variable approach aimed at double-checking the direction of the causality links confirms the overall consistency of the baseline estimates. However, it is worth noticing that the estimated effects are rather small in magnitude, which in turn might suggest that empirical applications based on less precise data could fail to properly estimate these effects.

All in all, this study finds evidence that conflict pushes households towards marginal self-employment activities. Thus, whereas the overall effect of conflict on the economy is likely to be negative, people tend to hold on their survival capabilities.

Are the findings supportive of directing international aids to entrepreneurship in conflict-ridden countries? Possibly, for two reasons. The results show that the causal relation goes from conflict to entrepreneurship: it is resilient private economic activity – self-employment – which is driven by intensity, and not private economic activity which attracts more conflict (at least at the scale of private economic activity that an Afghan households holds). Second, and more speculatively, if financed, some of the entrepreneurial activity may become a strong leverage for economic development as soon as a conflict reduces in a specific area, even though it continues in other areas of the country. People who are forced out from employment into self-employment may become a source of future development.

However, more importantly, the results do show that violent conflict, even when driven by a foreign coalition, rewinds the slow process of structural change of a low income country. If the conflict lasts long enough, such regression may require a long time before the country can change direction again.

1.5 Appendix: Data Description

1.5.1 Household data harmonisation and construction

As described in Section 1.2.1 the methodologies used for data collection, as well as the questionnaires were different across waves. The harmonisation is easier for 2005 and 2007/8, as this surveys used the same sampling, and a more similar questionnaire. The comparison with 2003 is more complicated, particularly because of the different sampling, and is used in this paper as a robustness check providing a longer time variation.

Below we briefly describe the harmonisation procedure across waves that was followed, starting with the main control variables (1.2.1). Then the focus is on how the different sources of PEA were defined (1.5.2). Finally, we summarise how the differences that were introduced in the Afghan sub-national administrative boundaries (Provinces and Districts) were harmonised (1.5.3).

1.5.2 Private economic activity

As discussed in Section 1.2.1 the definition on the household's PEA is built using the the main source of the household income, for 2005-2007/8. Both waves use the same options, which makes the comparison seamless, allowing to define a number of different types of PEA. However, in order to harmonise the information on PEA also with the 2003 wave two main challenges had to be dealt with.

First, the 2003 questionnaire is less detailed and the information in the labour section (Section F) allows to identify only four PEA comparable with the information from the 2005-2007/8 surveys: business and self-employment, which can be further divided into agricultural and non-agricultural.

Second, the 2003 survey does not contain information on the sources of household income, but collects information on the household members' employment (including self-employment). On the other hand, in 2005 there is no section collecting labour information. Fortunately, in the 2007/8 survey both sections were available: income sources, as in 2005 (Section 8), and on employment, as in 2003 (Section 9). This allowed us to compare two different measures of the main household occupational

choice: one reflecting the main source of household income (comparable with 2005), and one reflecting the activity where each household member was employed (comparable with 2003). Correlating measures of self-employment using the two sources allowed to use the definition of self-employment in 2003 (defined through the employment sections) that is closer to the corresponding definition used for 2005-2007/8 (defined through the income section).

Table 1.22 compares the correlation between the level of self-employment in non agricultural activity, measured as the main source of *income*, and different measures of the level of self-employment, measured as the relative number of individuals *working* as self employed in non-agricultural activities. The variables are computed for the 2007-8 NRVA survey, using the income and labour sections, respectively. These are:

- Non-agricultural self-employment: is a dummy variable equal to 1 if *at least one* individual in the household is self-employed in a non-agricultural activity (members labour section).
- Absolute majority: is a dummy variable equal to 1 if the *absolute majority* of individuals in the household is self-employed in a non-agricultural activity (members labour section).
- Relative majority: is a dummy variable equal to 1 if the *relative majority* of individuals in the household is self-employed in a non-agricultural activity (members labour section).

Variables	(1)	(2)	(3)	(4)
Labour section variables				
At least one (at least one member of the HH works in non-agric. S.E.) (1)	1.000			
Absolute majority of HH members work in non-agric. S.E. (2)	0.562	1.000		
Relative majority of HH members work in non-agric. S.E. (3)	0.659	0.600	1.000	
Income section variable				
More than 50% of HH income is generated by non-agric. S.E. (4)	0.515	0.344	0.377	1.000

Table 1.22: **Correlations between self-employment in non agriculture using the income information from the labour section of the questionnaire (NRVA survey 2007/8).**

Table 1.22 shows that the highest correlations when in the labour section is obtained defining self-employment considering that at least one member of the household is self employed in a non-agricultural activity. Therefore, for 2003 one member of the household is enough to define the households as self employed. In this way the households' occupational choice is defined in a way that is close to the 2005 and 2007/8 definition where only the information on the income sources is available.

The longest panel (2003-2005-2007/8) includes the following definitions of PEA for all years.

- Business owners:
  - 2003: identifies households for which the relative majority of the members answered 'private business' when asked about their main occupation, and 'self-employed' when asked about how they were paid.
  - 2005-07/8: identifies households which answered that a 'small business' was their *main* source of income. That is, not all business owners, if the business was not the main source.
- Non-agricultural self-employment
  - 2003: identifies households for which the relative majority of the members answered 'self-employed' when asked about their main occupation, 'self-employed' when asked about how they were paid, and who's main activity at place of job differed from *agriculture*, as well as from mining, education or health and administrative (office).
  - 2005-07/8: identifies households which answered that one of the non agricultural activities listed in Table 1.1, first column, was their *main* source of income.
- Agricultural self-employment:
  - 2003: identifies households for which the relative majority of the members answered 'self-employed' when asked about their main occupation, 'self-employed' when asked about how they were paid, and who's main activity at place of job is only *agriculture*.
  - 2005-07/8: identifies households which answered that one of the agricultural activities listed in Table 1.1, fourth column, was their *main* source of income.

1.5.3 Afghan districts

The administrative boundaries of Afghan districts and provinces were subject to changes in 2005. We harmonized the district boundaries of 2003 (392 districts) using the 2005 new administrative division (398 districts). The analysis uses a partition of Afghanistan in 398 districts for all waves.

In particular, we re-assigned 2003 households to the newer 2005 districts using the village latitude and longitude and a shape-file provided by the Afghanistan Information and Management Services (AIMS) [17]. The allocation of households was implemented using ARCGIS.

For 2005-2007/8 we kept the same districts assigned by the CSO but we matched their codes with the ones assigned through ARCGIS to 2003 ($district\_gis$) using the district names, in order to obtain homogeneous codes for all the three NRVA waves.

1.5.4 Conflict data

Activities	definition
AIR ASSAULT	conflict air operations
AMBUSH	ambushes that most of the times end up with wounded/killed and with explosions
AMF-ON-ANA	events where a fire, even if friendly, occurred
ANA-ON-ANP	events where a fire, even if friendly, occurred
ARSON	actions where buildings/infrastructures were set on fire
ASSASSINATION	events where people were killed
ATTACK	events where someone was attacked. Not necessarily involves wounded/killed
BLUE-GREEN	events where there is a fire
BLUE-BLUE	events where there is a fire
BLUE/WHITE	events where there is a fire
BREACHING	events with fire and possibly casualties
CARJACKING	mainly enemies hijacking cars or other private vehicles
CCA	diverse suspicious events
CAS	events where helicopters are involved in the attack
CLOSE AIR SUPPORT	events where helicopters are involved in the attack

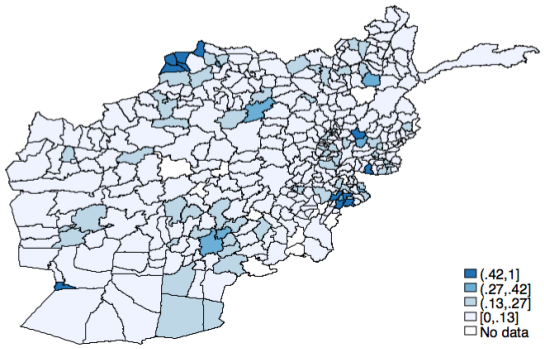
[17] available at http://www.aims.org.af/ssroots.aspx?seckeyt=295

COUNTER INSURGENCY	violent actions
COUNTER MORTAR FIRE	events where there is a fire
CRIMINAL ACTIVITY	it can include explosions, theft, wounded journalists during attacks
DELIBERATE ATTACK	it includes diverse violent actions, sometimes with wounded/killed individuals
DIRECT FIRE	events where there is a fire
DOWNED AIRCRAFT	it describes operations where aircrafts were downed
DRUG OPERATION	it can include fires and violent actions
ENEMY ACTION	it describes violent events with fire
ESCALATION OF FORCE	It describes violent actions with possibly wounded/killed
GREEN-BLUE	it describes events where there is a fire
GREEN-GREEN	it describes events where there is a fire
GREEN-WHITE	it describes events where there is a fire
DF COUNTER FIRE	it describes events where there is a fire
KIDNAPPING	it describes operations where someone was kidnapped
LOOTING	it describes operations where a loot took place
MINE STRIKE	events where there is an explosion
MURDER	it describes operations where someone was murdered
IED AMBUSH	attack on US army using Improvised Explosion Device
IDF INTERDICTION	prediction of a future fire/bombing while not happened yet
IED FOUND/CLEARED	IED detonated by the US military
IED EXPLOSION	mainly bombs, or suicide bombs against military and civilians
INTERDICTION	suicide bombers are spot and blocked, arrested, or killed, sometimes the IED explodes
SNIPER OPERATIONS	fire starts from an hidden place
TRIBAL	fire events. Violent tribal disputes
TRIBAL FEUD	violent tribal disputes
UAV	(Unmanned Aerial Vehicle): Mixed events that can include fire, wounded/killed
POLICE ACTIONS	they can be either violent or not. They can include fire
MEDEVAC(LOCAL NATIONAL	medical interventions
MINE FOUND/CLEARED	non-violent event
MOVEMENT TO CONTACT	movement in order to contact the enemy. It can be violent but not always
MUGGING	it describes operations where someone was mugged
NARCOTICS	disruption of a major drug labs

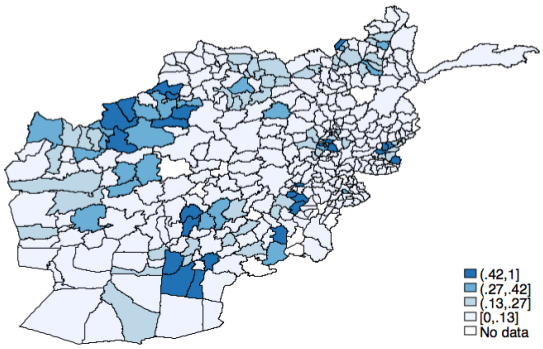
NBC	event that describes a show of force
NONE SELECTED	diverse events some of them violent
OTHER	conflict related event, with fire, or explosion
OTHER (HOSTILE ACTION)	events such as kidnapping/killing/robbery
OTHER DEFENSIVE	it can include fire/violent events
OTHER OFFENSIVE	it can include fire/violent events
POLICE ACTIONS	they can be either violent or not. They can include fire
POLICE INTERNAL	violent events with fire, wounded/killed
PLANNED EVENT	mixed evidence but mostly violent events
PREMATURE DETONATION	explosive events
RAID	violent events with possibly wounded/killed individuals
RPG	rocket-propelled grenade actions
SAFIRE	surface to air fire
SEARCH AND ATTACK	violent actions with possibly wounded/killed individuals
SECTARIAN VIOLENCE	violent events such as suicide bombers
SHOW OF FORCE	it reports either battle events or events where there is a fire
SMALL UNIT ACTIONS	violent actions possibly with direct fire, possibly with wounded/killed individuals
SNIPER OPS	fire started from an hidden place
UNKNOWN EXPLOSION	explosive event
VANDALISM	diverse disruptive events
VOGE	visual observation of ground explosion

Table 1.23: **List of categories included among the relevant conflict events**

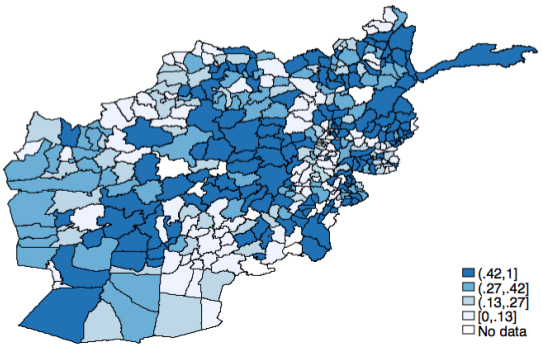
Conflict vs PEA maps



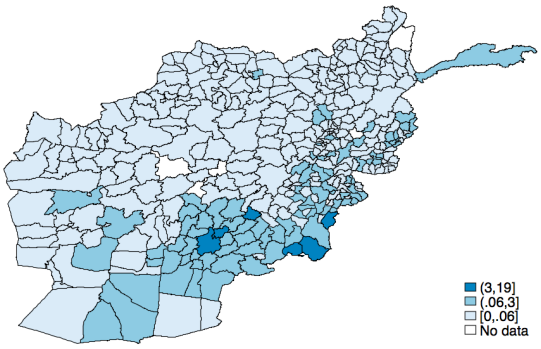
(a) Non agricultural self-employment



(b) Agriculture for sale

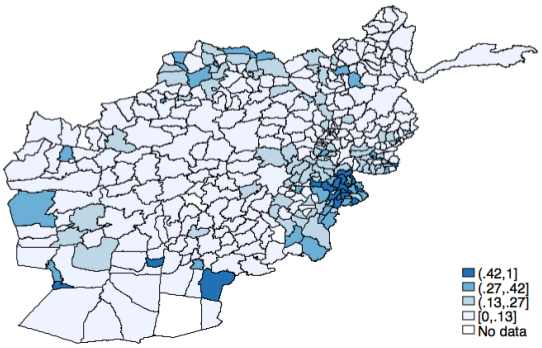


(c) Subsistence agriculture

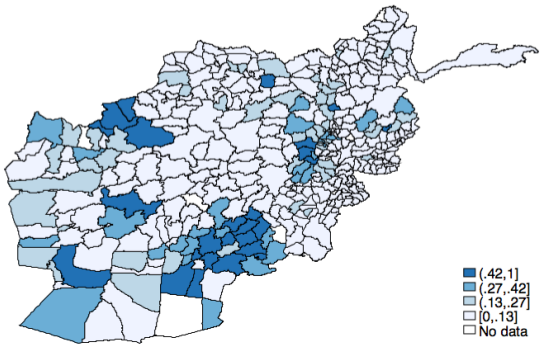


(d) Conflict intensity per capita

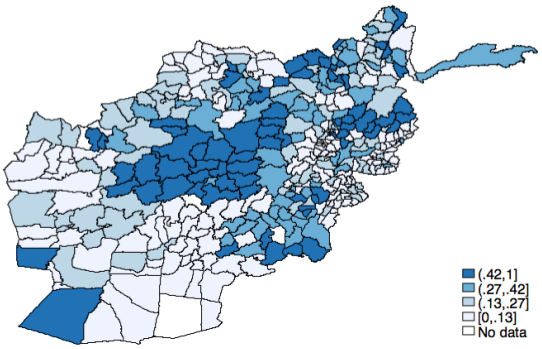
Figure 1.18: ***Percentage of household activity per district and conflict intensity: 2005***. *% of self employed in non agricultural activities per district 1.18a; % of self employed in agriculture for sale per district 1.18b; % of self employed in subsistence agriculture per district 1.18c ; number of conflict per district normalised by population 1.18d.*



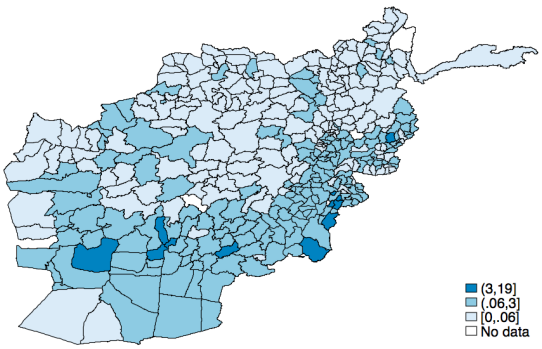
(a) Non agricultural self-employment



(b) Agriculture for sale



(c) Subsistence agriculture



(d) Conflict intensity per capita

Figure 1.19: ***Percentage of household activity per district and conflict intensity: 2008***. *% of self employed in non agricultural activities per district 1.19a; % of self employed in agriculture for sale per district 1.19b; % of self employed in subsistence agriculture per district 1.19c ; number of conflict per district normalised by population 1.19d.*

1.5.5 Additional tables

Table 1.24: **Pooled data 2005/2008, (AWD) (1)**

	(LPM)	(LPM)	(IV)	(LPM)	(LPM)	(IV)
VARIABLES	bus_own	bus_own	bus_own	se_hh	se_hh	se_hh2
N_conflict	0.00308	0.00406	0.0131	0.0136	0.0109	0.215**
	(0.00275)	(0.00280)	(0.0201)	(0.00968)	(0.00977)	(0.0968)
HHMemb2		0.00388	0.00275		-0.0980**	-0.124**
		(0.0143)	(0.0142)		(0.0382)	(0.0520)
HHMemb5		0.0115	0.0102		-0.0854**	-0.113**
		(0.0139)	(0.0137)		(0.0373)	(0.0515)
HHMemb10		0.0122	0.0111		-0.0656*	-0.0905*
		(0.0140)	(0.0138)		(0.0358)	(0.0508)
HHMemb15		0.0119	0.0109		-0.0482	-0.0724
		(0.0137)	(0.0135)		(0.0348)	(0.0493)
HHMemb20		0.00419	0.00387		-0.0148	-0.0222
		(0.0141)	(0.0140)		(0.0358)	(0.0400)
MaleH		0.00733	0.00708		0.0291**	0.0234*
		(0.00736)	(0.00720)		(0.0121)	(0.0136)
AgeHH		-0.000212***	-0.000213***		4.79e-06	-8.64e-07
		(6.64e-05)	(6.59e-05)		(0.000193)	(0.000199)
GenderAvHH		0.000813	0.000656		-0.00477	-0.00831
		(0.00201)	(0.00203)		(0.00513)	(0.00571)
LiteracyH		-0.00122	-0.00182		-0.00970	-0.0232**
		(0.00425)	(0.00423)		(0.00925)	(0.0115)
LiteracyAvHH		-0.00276	-0.00235		-0.00277	0.00644
		(0.00661)	(0.00663)		(0.0159)	(0.0176)
hhassets		0.00632**	0.00698**		0.0442***	0.0590***
		(0.00312)	(0.00344)		(0.00714)	(0.0125)
hhasset2		-0.00126**	-0.00142**		-0.00464***	-0.00810***
		(0.000501)	(0.000605)		(0.00136)	(0.00269)
Rural		-0.0341***	-0.0337***		-0.0829***	-0.0746***
		(0.00974)	(0.00970)		(0.0248)	(0.0265)
Credit_Other		-0.00392	-0.00463		0.0621*	0.0463
		(0.0114)	(0.0115)		(0.0370)	(0.0383)
Credit_Inst		0.0224	0.0228		0.0771**	0.0863**
		(0.0154)	(0.0153)		(0.0340)	(0.0346)
Credit_Lender		0.00257	0.00245		0.0271	0.0244
		(0.00754)	(0.00750)		(0.0186)	(0.0197)
Credit_Inform		0.00428	0.00393		0.00913	0.00126
		(0.00750)	(0.00749)		(0.0182)	(0.0194)
Credit_None		-0.00346	-0.00355		0.0204	0.0184
		(0.00867)	(0.00864)		(0.0233)	(0.0239)
Loan		-0.00546*	-0.00522*		-0.0590***	-0.0536***
		(0.00286)	(0.00276)		(0.00730)	(0.00847)
HHMigration		0.0108***	0.0106***		0.00955	0.00522
		(0.00285)	(0.00284)		(0.00917)	(0.0108)
shocks		-0.0139***	-0.0132***		-0.0297***	-0.0155
		(0.00341)	(0.00363)		(0.0109)	(0.0146)
Dremittances		-0.0212***	-0.0211***		-0.134***	-0.130***
		(0.00343)	(0.00344)		(0.0118)	(0.0124)
DSocialContr		-0.0299***	-0.0299***		-0.155***	-0.154***
		(0.00716)	(0.00709)		(0.0238)	(0.0242)
RoadKm		-0.000137	-0.000139		-0.000277	-0.000334
		(0.000171)	(0.000170)		(0.000658)	(0.000715)
RoadKm2		3.24e-07	3.34e-07		1.35e-06	1.58e-06
		(3.03e-07)	(3.03e-07)		(1.18e-06)	(1.28e-06)
DMkt_Close		0.00457	0.00410		-0.0147	-0.0253*
		(0.00318)	(0.00335)		(0.0102)	(0.0132)
DElectrNo		-0.00989**	-0.0109**		-0.0211**	-0.0436***
		(0.00388)	(0.00466)		(0.00941)	(0.0159)
Year F.E.	Yes	Yes	Yes	Yes	Yes	
Constant	0.0509***	0.0651***		0.215***	0.315***	
	(0.00223)	(0.0189)		(0.00564)	(0.0469)	
Observations	40,957	40,957	40,957	40,957	40,957	40,957
R-squared	0.053	0.059	0.006	0.111	0.132	-0.025

Notes: Cluster robust standard errors in parentheses, the cluster is the district *d*.
*** p<0.01, ** p<0.05, * p<0.1
The dependent variables are dummy variables defined at the household level specifying the type of activity of the household (see Table 1.3 for definitions). conflict measures are computed at the district level and are normalised by population. A unit of conflict is 1/1000 inhabitants (see Table 1.4 for definitions). All equations are estimated with the control variables described in Table 1.5, year and district fixed effects.

Table 1.25: **Pooled data 2005/2008, (AWD) (2)**

VARIABLES	(LPM) agric	(LPM) agric	(IV) agric	(LPM) se_nagr	(LPM) se_nagr	(IV) se_nagr
N_conflict	-0.0243	-0.0177	0.0577	-0.00627	-0.0117**	0.160***
	(0.0161)	(0.0154)	(0.0987)	(0.00411)	(0.00495)	(0.0523)
HHMemb2		-0.0564	-0.0658		-0.117***	-0.138***
		(0.0460)	(0.0525)		(0.0336)	(0.0434)
HHMemb5		-0.0534	-0.0637		-0.0989***	-0.122***
		(0.0460)	(0.0530)		(0.0337)	(0.0430)
HHMemb10		-0.0254	-0.0347		-0.0893***	-0.110***
		(0.0454)	(0.0522)		(0.0327)	(0.0425)
HHMemb15		-0.0156	-0.0246		-0.0715**	-0.0920**
		(0.0438)	(0.0504)		(0.0330)	(0.0422)
HHMemb20		0.00389	0.00115		-0.0424	-0.0486
		(0.0427)	(0.0434)		(0.0333)	(0.0359)
MaleH		0.0400***	0.0379***		0.00910	0.00432
		(0.0137)	(0.0140)		(0.0108)	(0.0122)
AgeHH		0.00197***	0.00197***		-0.000322**	-0.000327**
		(0.000233)	(0.000231)		(0.000147)	(0.000156)
GenderAvHH		-0.00327	-0.00458		-0.00353	-0.00650
		(0.00478)	(0.00510)		(0.00419)	(0.00455)
LiteracyH		-0.0105	-0.0155		-0.00415	-0.0155*
		(0.0120)	(0.0131)		(0.00726)	(0.00816)
LiteracyAvHH		-0.0258*	-0.0224		0.0163	0.0241
		(0.0138)	(0.0142)		(0.0148)	(0.0157)
hhassets		0.0531***	0.0585***		0.0161***	0.0285***
		(0.00829)	(0.0114)		(0.00499)	(0.00882)
hhasset2		-0.00605***	-0.00733***		-0.000855	-0.00377**
		(0.00146)	(0.00235)		(0.000903)	(0.00186)
Rural		0.254***	0.257***		-0.151***	-0.144***
		(0.0382)	(0.0390)		(0.0114)	(0.0123)
Credit_Other		-0.00790	-0.0138		0.0456**	0.0323
		(0.0471)	(0.0477)		(0.0204)	(0.0220)
Credit_Inst		-0.0123	-0.00895		0.0783***	0.0861***
		(0.0424)	(0.0426)		(0.0301)	(0.0305)
Credit_Lender		-0.0140	-0.0150		0.0234**	0.0211*
		(0.0340)	(0.0339)		(0.0111)	(0.0120)
Credit_Inform		-0.0203	-0.0232		0.0124	0.00577
		(0.0335)	(0.0336)		(0.0107)	(0.0116)
Credit_None		-0.0367	-0.0374		0.0240	0.0223
		(0.0356)	(0.0354)		(0.0154)	(0.0160)
Loan		-0.0319***	-0.0299***		-0.0355***	-0.0309***
		(0.00924)	(0.00925)		(0.00496)	(0.00620)
HHMigration		0.0317***	0.0301**		-0.00871	-0.0124*
		(0.0118)	(0.0122)		(0.00562)	(0.00721)
shocks		0.0685***	0.0738***		-0.0436***	-0.0316***
		(0.0138)	(0.0162)		(0.00739)	(0.00991)
Dremittances		-0.171***	-0.170***		-0.0865***	-0.0835***
		(0.0157)	(0.0156)		(0.00958)	(0.0101)
DSocialContr		-0.1000***	-0.0993***		-0.122***	-0.121***
		(0.0344)	(0.0341)		(0.0285)	(0.0287)
RoadKm		0.00106	0.00104		-0.000493	-0.000541
		(0.000757)	(0.000765)		(0.000325)	(0.000407)
RoadKm2		-3.31e-07	-2.46e-07		9.17e-07	1.11e-06
		(1.40e-06)	(1.42e-06)		(5.78e-07)	(7.22e-07)
DMkt_Close		-0.0301**	-0.0340**		-0.00285	-0.0118
		(0.0122)	(0.0137)		(0.00617)	(0.00892)
DElectrNo		0.0116	0.00327		-0.0347***	-0.0537***
		(0.0115)	(0.0164)		(0.00661)	(0.0103)
Year F.E.	Yes	Yes	Yes	Yes	Yes	
Constant	0.404***	0.0464		0.106***	0.352***	
	(0.00680)	(0.0726)		(0.00332)	(0.0399)	
Observations	40,957	40,957	40,957	40,957	40,957	40,957
R-squared	0.235	0.267	0.036	0.110	0.136	-0.025

Notes: Cluster robust standard errors in parentheses, the cluster is the district d.
*** p<0.01, ** p<0.05, * p<0.1
The dependent variables are dummy variables defined at the household level specifying the type of activity of the household (see Table 1.3 for definitions). conflict measures are computed at the district level and are normalised by population. A unit of conflict is 1/1000 inhabitants (see Table 1.4 for definitions). All equations are estimated with the control variables described in Table 1.5, year and district fixed effects.

Table 1.26: **Pooled data 2005/2008, (AWD) (3)**

VARIABLES	(LPM) Low_K	(LPM) Low_K	(IV) Low_K	(LPM) High_K	(LPM) High_K	(IV) High_K
N_conflict	-0.00694**	-0.0112***	0.0962***	0.00185	-0.000405	0.0639**
	(0.00278)	(0.00323)	(0.0316)	(0.00315)	(0.00306)	(0.0309)
HHMemb2		-0.0411	-0.0545		-0.0754**	-0.0834***
		(0.0276)	(0.0355)		(0.0304)	(0.0301)
HHMemb5		-0.0334	-0.0480		-0.0655**	-0.0743**
		(0.0277)	(0.0353)		(0.0299)	(0.0296)
HHMemb10		-0.0283	-0.0414		-0.0610**	-0.0689**
		(0.0274)	(0.0353)		(0.0296)	(0.0292)
HHMemb15		-0.0148	-0.0276		-0.0568*	-0.0644**
		(0.0276)	(0.0351)		(0.0293)	(0.0289)
HHMemb20		-0.0101	-0.0140		-0.0323	-0.0346
		(0.0268)	(0.0296)		(0.0300)	(0.0294)
MaleH		-0.000162	-0.00315		0.00926*	0.00747
		(0.00962)	(0.0107)		(0.00553)	(0.00540)
AgeHH		5.86e-06	2.88e-06		-0.000328***	-0.000330***
		(0.000104)	(0.000106)		(0.000100)	(0.000103)
GenderAvHH		-0.00416	-0.00602**		0.000633	-0.000483
		(0.00291)	(0.00306)		(0.00269)	(0.00279)
LiteracyH		-0.0102**	-0.0173***		0.00609	0.00184
		(0.00436)	(0.00526)		(0.00557)	(0.00562)
LiteracyAvHH		0.0234	0.0283*		-0.00711	-0.00421
		(0.0163)	(0.0168)		(0.00591)	(0.00628)
hhassets		0.00496	0.0127*		0.0111***	0.0158***
		(0.00467)	(0.00654)		(0.00235)	(0.00383)
hhasset2		0.000373	-0.00145		-0.00123***	-0.00232***
		(0.000846)	(0.00134)		(0.000394)	(0.000774)
Rural		-0.120***	-0.116***		-0.0301***	-0.0275***
		(0.0139)	(0.0142)		(0.00841)	(0.00861)
Credit_Other		0.0169	0.00858		0.0287*	0.0237
		(0.0153)	(0.0159)		(0.0149)	(0.0153)
Credit_Inst		0.0703***	0.0751***		0.00805	0.0109
		(0.0242)	(0.0245)		(0.0148)	(0.0147)
Credit_Lender		0.0155	0.0141		0.00788	0.00703
		(0.00981)	(0.0103)		(0.00686)	(0.00694)
Credit_Inform		0.00696	0.00281		0.00544	0.00296
		(0.00958)	(0.0101)		(0.00647)	(0.00662)
Credit_None		0.0230*	0.0219*		0.000992	0.000352
		(0.0124)	(0.0126)		(0.00784)	(0.00805)
Loan		-0.0202***	-0.0174***		-0.0153***	-0.0135***
		(0.00373)	(0.00438)		(0.00319)	(0.00357)
HHMigration		-0.00739*	-0.00967*		-0.00132	-0.00268
		(0.00444)	(0.00518)		(0.00327)	(0.00374)
shocks		-0.0321***	-0.0246***		-0.0115***	-0.00704
		(0.00573)	(0.00722)		(0.00368)	(0.00463)
Dremittances		-0.0488***	-0.0469***		-0.0377***	-0.0365***
		(0.00653)	(0.00673)		(0.00529)	(0.00547)
DSocialContr		-0.0844***	-0.0835***		-0.0376**	-0.0370**
		(0.0159)	(0.0161)		(0.0162)	(0.0161)
RoadKm		-0.000166	-0.000196		-0.000327**	-0.000345*
		(0.000260)	(0.000296)		(0.000147)	(0.000178)
RoadKm2		4.28e-07	5.49e-07		4.88e-07*	5.60e-07*
		(4.66e-07)	(5.28e-07)		(2.59e-07)	(3.16e-07)
DMkt_Close		0.00200	-0.00361		-0.00485	-0.00821**
		(0.00532)	(0.00677)		(0.00312)	(0.00412)
DElectrNo		-0.0219***	-0.0338***		-0.0128**	-0.0199***
		(0.00571)	(0.00771)		(0.00521)	(0.00653)
Year F.E.	Yes	Yes	Yes	Yes	Yes	Yes
Constant	0.0653***	0.213***		0.0438***	0.139***	
	(0.00266)	(0.0320)		(0.00205)	(0.0323)	
Observations	47,218	40,957	40,957	47,218	40,957	40,957
R-squared	0.092	0.107	-0.010	0.049	0.058	-0.010

Notes: Cluster robust standard errors in parentheses, the cluster is the district *d*.
*** p<0.01, ** p<0.05, * p<0.1
The dependent variables are dummy variables defined at the household level specifying the type of activity of the household (see Table 1.3 for definitions). conflict measures are computed at the district level and are normalised by population. A unit of conflict is 1/1000 inhabitants (see Table 1.4 for definitions). All equations are estimated with the control variables described in Table 1.5, year and district fixed effects.

Table 1.27: **Pooled data 2005/2008, (AWD) (4)**

VARIABLES	(LPM) sub_agr	(LPM) sub_agr	(IV) sub_agr	(LPM) agr_sale	(LPM) agr_sale	(IV) agr_sale
N_conflict	-0.0433***	-0.0403***	0.00299	0.0223***	0.0226***	0.0548
	(0.0132)	(0.0128)	(0.148)	(0.00828)	(0.00868)	(0.0643)
HHMemb2		-0.0749*	-0.0803*		0.0185	0.0145
		(0.0424)	(0.0486)		(0.0229)	(0.0248)
HHMemb5		-0.0670	-0.0729		0.0136	0.00918
		(0.0424)	(0.0492)		(0.0211)	(0.0237)
HHMemb10		-0.0492	-0.0545		0.0237	0.0198
		(0.0419)	(0.0481)		(0.0205)	(0.0228)
HHMemb15		-0.0390	-0.0441		0.0234	0.0195
		(0.0400)	(0.0460)		(0.0198)	(0.0222)
HHMemb20		-0.0237	-0.0252		0.0275	0.0264
		(0.0388)	(0.0393)		(0.0219)	(0.0222)
MaleH		0.0200	0.0188		0.0200***	0.0191**
		(0.0125)	(0.0132)		(0.00734)	(0.00746)
AgeHH		0.00164***	0.00164***		0.000327**	0.000326**
		(0.000207)	(0.000206)		(0.000143)	(0.000141)
GenderAvHH		-0.00203	-0.00278		-0.00124	-0.00180
		(0.00429)	(0.00493)		(0.00324)	(0.00346)
LiteracyH		-0.00498	-0.00784		-0.00555	-0.00767
		(0.0117)	(0.0151)		(0.00715)	(0.00837)
LiteracyAvHH		-0.00671	-0.00476		-0.0191*	-0.0176*
		(0.0127)	(0.0143)		(0.00973)	(0.00997)
hhassets		0.0250***	0.0281**		0.0281***	0.0304***
		(0.00787)	(0.0132)		(0.00487)	(0.00698)
hhasset2		-0.00227*	-0.00300		-0.00378***	-0.00433***
		(0.00130)	(0.00283)		(0.000861)	(0.00144)
Rural		0.187***	0.188***		0.0677***	0.0690***
		(0.0323)	(0.0330)		(0.0216)	(0.0217)
Credit_Other		-0.0244	-0.0277		0.0165	0.0140
		(0.0507)	(0.0516)		(0.0315)	(0.0318)
Credit_Inst		-0.0111	-0.00915		-0.00125	0.000196
		(0.0381)	(0.0387)		(0.0188)	(0.0189)
Credit_Lender		-0.0177	-0.0182		0.00371	0.00328
		(0.0346)	(0.0344)		(0.0162)	(0.0162)
Credit_Inform		-0.0170	-0.0187		-0.00327	-0.00451
		(0.0344)	(0.0346)		(0.0155)	(0.0157)
Credit_None		-0.0331	-0.0335		-0.00356	-0.00388
		(0.0360)	(0.0358)		(0.0180)	(0.0179)
Loan		-0.00836	-0.00721		-0.0235***	-0.0226***
		(0.00795)	(0.00864)		(0.00605)	(0.00605)
HHMigration		0.0134	0.0125		0.0183***	0.0176**
		(0.0111)	(0.0115)		(0.00683)	(0.00697)
shocks		0.0546***	0.0576***		0.0139*	0.0161*
		(0.0118)	(0.0160)		(0.00757)	(0.00897)
Dremittances		-0.124***	-0.123***		-0.0472***	-0.0467***
		(0.0147)	(0.0149)		(0.00680)	(0.00679)
DSocialContr		-0.0667***	-0.0663***		-0.0333**	-0.0330**
		(0.0243)	(0.0241)		(0.0155)	(0.0154)
RoadKm		0.000847	0.000835		0.000216	0.000207
		(0.000741)	(0.000742)		(0.000581)	(0.000578)
RoadKm2		-7.67e-07	-7.19e-07		4.36e-07	4.72e-07
		(1.42e-06)	(1.43e-06)		(1.04e-06)	(1.03e-06)
DMkt_Close		-0.0183	-0.0205		-0.0118	-0.0135
		(0.0113)	(0.0139)		(0.00853)	(0.00931)
DElectrNo		-0.00204	-0.00683		0.0137*	0.0101
		(0.0106)	(0.0198)		(0.00703)	(0.00997)
Year F.E.	Yes	Yes	Yes	Yes	Yes	Yes
Constant	0.296***	0.0837		0.103***	-0.0373	
	(0.00577)	(0.0663)		(0.00383)	(0.0366)	
Observations	47,218	40,957	40,957	47,218	40,957	40,957
R-squared	0.237	0.258	0.026	0.163	0.174	0.009

Notes: Cluster robust standard errors in parentheses, the cluster is the district d.
*** p<0.01, ** p<0.05, * p<0.1
The dependent variables are dummy variables defined at the household level specifying the type of activity of the household (see Table 1.3 for definitions). conflict measures are computed at the district level and are normalised by population. A unit of conflict is 1/1000 inhabitants (see Table 1.4 for definitions). All equations are estimated with the control variables described in Table 1.5, year and district fixed effects.

Table 1.28: **Pooled data 2005/2008, (AWD) (1)**

	(LPM)	(LPM)	(IV)	(LPM)	(LPM)	(IV)
VARIABLES	bus_own	bus_own	bus_own	se_hh	se_hh	se_hh
N_wk	0.00293	0.00352	0.00923	0.0178*	0.0134	0.151*
	(0.00261)	(0.00262)	(0.0149)	(0.00922)	(0.00942)	(0.0824)
HHMemb2		0.00398	0.00332		-0.0982**	-0.114***
		(0.0144)	(0.0142)		(0.0382)	(0.0414)
HHMemb5		0.0115	0.0106		-0.0859**	-0.106**
		(0.0140)	(0.0138)		(0.0373)	(0.0415)
HHMemb10		0.0122	0.0115		-0.0661*	-0.0849**
		(0.0141)	(0.0139)		(0.0358)	(0.0400)
HHMemb15		0.0120	0.0112		-0.0486	-0.0661*
		(0.0138)	(0.0136)		(0.0348)	(0.0392)
HHMemb20		0.00410	0.00370		-0.0154	-0.0250
		(0.0141)	(0.0140)		(0.0359)	(0.0378)
MaleH		0.00728	0.00701		0.0287**	0.0221*
		(0.00734)	(0.00721)		(0.0121)	(0.0133)
AgeHH		-0.000212***	-0.000212***		6.04e-06	1.58e-05
		(6.64e-05)	(6.59e-05)		(0.000193)	(0.000196)
GenderAvHH		0.000843	0.000778		-0.00473	-0.00630
		(0.00201)	(0.00201)		(0.00512)	(0.00529)
LiteracyH		-0.00122	-0.00165		-0.0100	-0.0205*
		(0.00424)	(0.00420)		(0.00926)	(0.0114)
LiteracyAvHH		-0.00281	-0.00260		-0.00276	0.00238
		(0.00660)	(0.00657)		(0.0158)	(0.0167)
hhassets		0.00627**	0.00666**		0.0443***	0.0537***
		(0.00311)	(0.00326)		(0.00707)	(0.0100)
hhasset2		-0.00125**	-0.00134**		-0.00467***	-0.00685***
		(0.000497)	(0.000551)		(0.00134)	(0.00212)
Rural		-0.0340***	-0.0337***		-0.0826***	-0.0751***
		(0.00975)	(0.00974)		(0.0248)	(0.0251)
Credit_Other		-0.00381	-0.00414		0.0622*	0.0543
		(0.0113)	(0.0114)		(0.0370)	(0.0376)
Credit_Inst		0.0224	0.0227		0.0774**	0.0853**
		(0.0154)	(0.0153)		(0.0340)	(0.0347)
Credit_Lender		0.00265	0.00269		0.0274	0.0283
		(0.00754)	(0.00750)		(0.0186)	(0.0194)
Credit_Inform		0.00435	0.00421		0.00921	0.00571
		(0.00749)	(0.00745)		(0.0182)	(0.0188)
Credit_None		-0.00340	-0.00336		0.0206	0.0215
		(0.00866)	(0.00860)		(0.0234)	(0.0242)
Loan		-0.00545*	-0.00526*		-0.0589***	-0.0544***
		(0.00285)	(0.00278)		(0.00728)	(0.00786)
HHMigration		0.0109***	0.0109***		0.00974	0.00936
		(0.00286)	(0.00283)		(0.00916)	(0.00987)
shocks		-0.0139***	-0.0136***		-0.0296***	-0.0207
		(0.00341)	(0.00351)		(0.0109)	(0.0128)
Dremittances		-0.0211***	-0.0209***		-0.133***	-0.127***
		(0.00343)	(0.00346)		(0.0118)	(0.0126)
DSocialContr		-0.0298***	-0.0295***		-0.155***	-0.148***
		(0.00713)	(0.00696)		(0.0238)	(0.0248)
RoadKm		-0.000141	-0.000151		-0.000295	-0.000518
		(0.000171)	(0.000172)		(0.000659)	(0.000729)
RoadKm2		3.32e-07	3.52e-07		1.39e-06	1.87e-06
		(3.03e-07)	(3.06e-07)		(1.18e-06)	(1.31e-06)
DMkt_Close		0.00466	0.00446		-0.0146	-0.0194*
		(0.00322)	(0.00323)		(0.0102)	(0.0113)
DElectrNo		-0.00978**	-0.0103**		-0.0211**	-0.0343***
		(0.00383)	(0.00420)		(0.00936)	(0.0126)
Year F.E.	Yes	Yes	Yes	Yes	Yes	Yes
Constant	0.0507***	0.0647***		0.213***	0.314***	
	(0.00222)	(0.0189)		(0.00580)	(0.0468)	
Observations	40,957	40,957	40,957	40,957	40,957	40,957
R-squared	0.053	0.059	0.006	0.111	0.132	0.001

Notes: Cluster robust standard errors in parentheses, the cluster is the district *d*.
*** p<0.01, ** p<0.05, * p<0.1
The dependent variables are dummy variables defined at the household level specifying the type of activity of the household (see Table 1.3 for definitions). conflict measures are computed at the district level and are normalised by population. A unit of conflict is 1/1000 inhabitants (see Table 1.4 for definitions). All equations are estimated with the control variables described in Table 1.5, year and district fixed effects.

Table 1.29: **Pooled data 2005/2008, (AWD) (2)**

VARIABLES	(LPM) agric	(LPM) agric	(IV) agric	(LPM) se_nagr	(LPM) se_nagr	(IV) se_nagr
N_wk	-0.0146	-0.00908	0.0406	0.000975	-0.00537	0.112***
	(0.0137)	(0.0130)	(0.0665)	(0.00590)	(0.00616)	(0.0435)
HHMemb2		-0.0576	-0.0633		-0.117***	-0.131***
		(0.0467)	(0.0488)		(0.0336)	(0.0361)
HHMemb5		-0.0545	-0.0619		-0.0997***	-0.117***
		(0.0466)	(0.0494)		(0.0336)	(0.0365)
HHMemb10		-0.0264	-0.0332		-0.0900***	-0.106***
		(0.0462)	(0.0487)		(0.0326)	(0.0355)
HHMemb15		-0.0166	-0.0229		-0.0723**	-0.0872**
		(0.0445)	(0.0470)		(0.0330)	(0.0359)
HHMemb20		0.00388	0.000406		-0.0424	-0.0507
		(0.0428)	(0.0432)		(0.0332)	(0.0347)
MaleH		0.0399***	0.0376***		0.00903	0.00340
		(0.0137)	(0.0140)		(0.0108)	(0.0120)
AgeHH		0.00197***	0.00197***		-0.000323**	-0.000314**
		(0.000233)	(0.000231)		(0.000147)	(0.000151)
GenderAvHH		-0.00348	-0.00404		-0.00367	-0.00501
		(0.00480)	(0.00485)		(0.00419)	(0.00429)
LiteracyH		-0.0110	-0.0148		-0.00451	-0.0135*
		(0.0120)	(0.0125)		(0.00728)	(0.00802)
LiteracyAvHH		-0.0253*	-0.0235*		0.0166	0.0210
		(0.0138)	(0.0138)		(0.0148)	(0.0151)
hhassets		0.0537***	0.0571***		0.0165***	0.0246***
		(0.00825)	(0.00977)		(0.00499)	(0.00695)
hhasset2		-0.00621***	-0.00700***		-0.000967	-0.00284**
		(0.00146)	(0.00190)		(0.000906)	(0.00142)
Rural		0.254***	0.257***		-0.150***	-0.144***
		(0.0384)	(0.0385)		(0.0114)	(0.0116)
Credit_Other		-0.00876	-0.0116		0.0450**	0.0383*
		(0.0472)	(0.0469)		(0.0204)	(0.0213)
Credit_Inst		-0.0121	-0.00921		0.0786***	0.0853***
		(0.0424)	(0.0424)		(0.0301)	(0.0305)
Credit_Lender		-0.0142	-0.0139		0.0232**	0.0240**
		(0.0340)	(0.0339)		(0.0111)	(0.0116)
Credit_Inform		-0.0207	-0.0220		0.0121	0.00908
		(0.0335)	(0.0334)		(0.0106)	(0.0111)
Credit_None		-0.0369	-0.0366		0.0238	0.0246
		(0.0356)	(0.0355)		(0.0154)	(0.0158)
Loan		-0.0317***	-0.0301***		-0.0354***	-0.0315***
		(0.00926)	(0.00913)		(0.00495)	(0.00549)
HHMigration		0.0313***	0.0312***		-0.00894	-0.00927
		(0.0119)	(0.0120)		(0.00563)	(0.00632)
shocks		0.0691***	0.0724***		-0.0431***	-0.0355***
		(0.0138)	(0.0149)		(0.00741)	(0.00871)
Dremittances		-0.171***	-0.169***		-0.0865***	-0.0812***
		(0.0157)	(0.0156)		(0.00959)	(0.00991)
DSocialContr		-0.100***	-0.0978***		-0.122***	-0.116***
		(0.0345)	(0.0336)		(0.0285)	(0.0293)
RoadKm		0.00107	0.000992		-0.000488	-0.000678*
		(0.000757)	(0.000779)		(0.000326)	(0.000387)
RoadKm2		-3.43e-07	-1.69e-07		9.11e-07	1.32e-06*
		(1.40e-06)	(1.44e-06)		(5.79e-07)	(6.88e-07)
DMkt_Close		-0.0307**	-0.0325**		-0.00327	-0.00743
		(0.0123)	(0.0127)		(0.00623)	(0.00739)
DElectrNo		0.0105	0.00577		-0.0355***	-0.0468***
		(0.0114)	(0.0133)		(0.00662)	(0.00813)
Year F.E.	Yes	Yes	Yes	Yes	Yes	Yes
Constant	0.404***	0.0487		0.105***	0.353***	
	(0.00710)	(0.0733)		(0.00345)	(0.0399)	
Observations	40,957	40,957	40,957	40,957	40,957	40,957
R-squared	0.235	0.267	0.039	0.110	0.136	0.003

Notes: Cluster robust standard errors in parentheses, the cluster is the district d.
*** p<0.01, ** p<0.05, * p<0.1
The dependent variables are dummy variables defined at the household level specifying the type of activity of the household (see Table 1.3 for definitions). conflict measures are computed at the district level and are normalised by population. A unit of conflict is 1/1000 inhabitants (see Table 1.4 for definitions). All equations are estimated with the control variables described in Table 1.5, year and district fixed effects.

Table 1.30: **Pooled data 2005/2008, (AWD) (3)**

	(LPM)	(LPM)	(IV)	(LPM)	(LPM)	(IV)
VARIABLES	Low_K	Low_K	Low_K	High_K	High_K	High_K
N_wk	-0.00256	-0.00645	0.0676**	0.00381	0.00108	0.0449**
	(0.00466)	(0.00481)	(0.0275)	(0.00378)	(0.00359)	(0.0227)
HHMemb2		-0.0418	-0.0504*		-0.0756**	-0.0807***
		(0.0279)	(0.0301)		(0.0304)	(0.0301)
HHMemb5		-0.0340	-0.0450		-0.0657**	-0.0723**
		(0.0280)	(0.0303)		(0.0299)	(0.0298)
HHMemb10		-0.0287	-0.0389		-0.0612**	-0.0672**
		(0.0277)	(0.0301)		(0.0295)	(0.0293)
HHMemb15		-0.0153	-0.0247		-0.0569*	-0.0625**
		(0.0279)	(0.0302)		(0.0293)	(0.0291)
HHMemb20		-0.0100	-0.0152		-0.0324	-0.0355
		(0.0270)	(0.0276)		(0.0300)	(0.0301)
MaleH		-0.000166	-0.00370		0.00920*	0.00710
		(0.00966)	(0.0106)		(0.00552)	(0.00545)
AgeHH		5.09e-06	1.03e-05		-0.000328***	-0.000325***
		(0.000104)	(0.000104)		(0.000100)	(0.000102)
GenderAvHH		-0.00428	-0.00512*		0.000614	0.000114
		(0.00291)	(0.00294)		(0.00269)	(0.00270)
LiteracyH		-0.0105**	-0.0161***		0.00599	0.00264
		(0.00437)	(0.00513)		(0.00558)	(0.00557)
LiteracyAvHH		0.0237	0.0264		-0.00706	-0.00542
		(0.0163)	(0.0165)		(0.00591)	(0.00602)
hhassets		0.00534	0.0104*		0.0112***	0.0142***
		(0.00465)	(0.00562)		(0.00237)	(0.00300)
hhasset2		0.000285	-0.000893		-0.00125***	-0.00195***
		(0.000844)	(0.00111)		(0.000399)	(0.000571)
Rural		-0.120***	-0.116***		-0.0300***	-0.0276***
		(0.0139)	(0.0137)		(0.00841)	(0.00866)
Credit_Other		0.0164	0.0122		0.0286*	0.0261*
		(0.0153)	(0.0156)		(0.0149)	(0.0151)
Credit_Inst		0.0704***	0.0747***		0.00813	0.0107
		(0.0242)	(0.0245)		(0.0148)	(0.0147)
Credit_Lender		0.0153	0.0158		0.00788	0.00817
		(0.00981)	(0.0101)		(0.00686)	(0.00689)
Credit_Inform		0.00669	0.00480		0.00540	0.00428
		(0.00958)	(0.00985)		(0.00646)	(0.00649)
Credit_None		0.0228*	0.0233*		0.000995	0.00129
		(0.0124)	(0.0125)		(0.00783)	(0.00799)
Loan		-0.0202***	-0.0177***		-0.0152***	-0.0138***
		(0.00372)	(0.00408)		(0.00318)	(0.00332)
HHMigration		-0.00761*	-0.00782		-0.00133	-0.00145
		(0.00444)	(0.00480)		(0.00327)	(0.00341)
shocks		-0.0317***	-0.0269***		-0.0114***	-0.00860**
		(0.00573)	(0.00655)		(0.00364)	(0.00410)
Dremittances		-0.0489***	-0.0456***		-0.0376***	-0.0357***
		(0.00652)	(0.00674)		(0.00529)	(0.00535)
DSocialContr		-0.0847***	-0.0810***		-0.0375**	-0.0353**
		(0.0159)	(0.0165)		(0.0162)	(0.0163)
RoadKm		-0.000158	-0.000278		-0.000329**	-0.000400**
		(0.000261)	(0.000286)		(0.000147)	(0.000173)
RoadKm2		4.18e-07	6.78e-07		4.92e-07*	6.46e-07**
		(4.67e-07)	(5.11e-07)		(2.59e-07)	(3.08e-07)
DMkt_Close		0.00164	-0.000973		-0.00491	-0.00646*
		(0.00537)	(0.00597)		(0.00311)	(0.00350)
DElectrNo		-0.0225***	-0.0296***		-0.0130**	-0.0172***
		(0.00572)	(0.00659)		(0.00519)	(0.00565)
Year F.E.	Yes	Yes	Yes	Yes	Yes	Yes
Constant	0.0652***	0.214***		0.0434***	0.139***	
	(0.00278)	(0.0324)		(0.00207)	(0.0322)	
Observations	47,218	40,957	40,957	47,218	40,957	40,957
R-squared	0.092	0.107	0.006	0.049	0.058	-0.000

Notes: Cluster robust standard errors in parentheses, the cluster is the district *d*.
*** p<0.01, ** p<0.05, * p<0.1
The dependent variables are dummy variables defined at the household level specifying the type of activity of the household (see Table 1.3 for definitions). conflict measures are computed at the district level and are normalised by population. A unit of conflict is 1/1000 inhabitants (see Table 1.4 for definitions). All equations are estimated with the control variables described in Table 1.5, year and district fixed effects.

Table 1.31: **Pooled data 2005/2008, (AWD) (4)**

VARIABLES	(LPM) sub_agr	(LPM) sub_agr	(IV) sub_agr	(LPM) agr_sale	(LPM) agr_sale	(IV) agr_sale
N_wk	-0.0298**	-0.0279**	0.00210	0.0167**	0.0188**	0.0385
	(0.0131)	(0.0127)	(0.104)	(0.00809)	(0.00920)	(0.0491)
HHMemb2		-0.0767*	-0.0802*		0.0192	0.0169
		(0.0438)	(0.0462)		(0.0226)	(0.0231)
HHMemb5		-0.0683	-0.0728		0.0138	0.0109
		(0.0437)	(0.0473)		(0.0207)	(0.0219)
HHMemb10		-0.0503	-0.0544		0.0239	0.0212
		(0.0433)	(0.0465)		(0.0201)	(0.0210)
HHMemb15		-0.0402	-0.0441		0.0237	0.0211
		(0.0413)	(0.0442)		(0.0195)	(0.0204)
HHMemb20		-0.0232	-0.0253		0.0271	0.0257
		(0.0390)	(0.0397)		(0.0217)	(0.0219)
MaleH		0.0202	0.0188		0.0197***	0.0187**
		(0.0125)	(0.0134)		(0.00721)	(0.00747)
AgeHH		0.00164***	0.00164***		0.000329**	0.000330**
		(0.000208)	(0.000206)		(0.000143)	(0.000143)
GenderAvHH		-0.00241	-0.00275		-0.00107	-0.00129
		(0.00431)	(0.00442)		(0.00324)	(0.00329)
LiteracyH		-0.00552	-0.00781		-0.00549	-0.00699
		(0.0117)	(0.0140)		(0.00716)	(0.00812)
LiteracyAvHH		-0.00593	-0.00481		-0.0194**	-0.0186*
		(0.0127)	(0.0132)		(0.00975)	(0.00981)
hhassets		0.0260***	0.0280***		0.0278***	0.0291***
		(0.00786)	(0.0105)		(0.00481)	(0.00601)
hhasset2		-0.00251*	-0.00298		-0.00370***	-0.00401***
		(0.00131)	(0.00212)		(0.000843)	(0.00118)
Rural		0.187***	0.188***		0.0678***	0.0688***
		(0.0325)	(0.0329)		(0.0214)	(0.0214)
Credit_Other		-0.0259	-0.0276		0.0171	0.0160
		(0.0509)	(0.0508)		(0.0315)	(0.0315)
Credit_Inst		-0.0109	-0.00916		-0.00119	-5.30e-05
		(0.0381)	(0.0385)		(0.0188)	(0.0189)
Credit_Lender		-0.0184	-0.0182		0.00413	0.00426
		(0.0346)	(0.0344)		(0.0162)	(0.0162)
Credit_Inform		-0.0179	-0.0186		-0.00287	-0.00337
		(0.0344)	(0.0343)		(0.0155)	(0.0155)
Credit_None		-0.0337	-0.0335		-0.00321	-0.00308
		(0.0360)	(0.0358)		(0.0181)	(0.0181)
Loan		-0.00819	-0.00722		-0.0235***	-0.0228***
		(0.00801)	(0.00843)		(0.00607)	(0.00605)
HHMigration		0.0127	0.0126		0.0187***	0.0186***
		(0.0112)	(0.0112)		(0.00682)	(0.00683)
shocks		0.0556***	0.0575***		0.0135*	0.0148*
		(0.0119)	(0.0139)		(0.00754)	(0.00823)
Dremittances		-0.125***	-0.123***		-0.0468***	-0.0459***
		(0.0148)	(0.0154)		(0.00680)	(0.00701)
DSocialContr		-0.0677***	-0.0662***		-0.0326**	-0.0316**
		(0.0244)	(0.0244)		(0.0154)	(0.0152)
RoadKm		0.000881	0.000832		0.000192	0.000160
		(0.000740)	(0.000760)		(0.000584)	(0.000589)
RoadKm2		-8.19e-07	-7.15e-07		4.77e-07	5.46e-07
		(1.42e-06)	(1.46e-06)		(1.04e-06)	(1.05e-06)
DMkt_Close		-0.0194*	-0.0204*		-0.0113	-0.0120
		(0.0114)	(0.0120)		(0.00855)	(0.00872)
DElectrNo		-0.00383	-0.00670		0.0144**	0.0125
		(0.0106)	(0.0148)		(0.00702)	(0.00834)
Year F.E.	Yes	Yes	Yes	Yes	Yes	Yes
Constant	0.297***	0.0884		0.102***	-0.0397	
	(0.00603)	(0.0674)		(0.00395)	(0.0364)	
Observations	47,218	40,957	40,957	47,218	40,957	40,957
R-squared	0.236	0.258	0.026	0.163	0.174	0.010

Notes: Cluster robust standard errors in parentheses, the cluster is the district d.
*** p<0.01, ** p<0.05, * p<0.1
The dependent variables are dummy variables defined at the household level specifying the type of activity of the household (see Table 1.3 for definitions). conflict measures are computed at the district level and are normalised by population. A unit of conflict is 1/1000 inhabitants (see Table 1.4 for definitions). All equations are estimated with the control variables described in Table 1.5, year and district fixed effects.

Chapter 2

Child Labour and Conflict, Evidence from Afghanistan

2.1 Introduction

Does conflict affect child labour? While a large literature on child labour and the economics of conflict exist, relatively little is known about whether conflict influences the incidence of child labour. The starting point of the present paper is that the economic literature that studies the effect of conflict on the extensive margin of child labour supply is scarce and there are no studies that analysed the impact of conflict on its intensive margin.

The intensive margin response of child labour supply is an important measure of the impact of conflict on child labour. Conflict may affect both directly and indirectly some of the child labour determinants, such as household schooling decisions, the intra-household allocation of the labour supply, and household wealth, which affects the decision of whether a child enters the labour force. However, it is also possible that as a consequence of higher conflict intensity a child already in the labour force adjusts the number of hours worked. Chapter one suggests that higher conflict intensity increases private economic activity. This could be a channel through which conflict increases the intensive margin of child labour supply. Also, the current literature provides evidence of a positive impact of conflict on the extensive margin of child labour supply (e.g. see Di Maio and Nandi [2013] and Rodriguez and Sanchez [2012]). This may hint at possibility of a positive intensive

effect - but has, as yet, not been investigated in the economic literature. The impact of conflict on the intensive margin of child labour supply is relevant since if the child works more hours the time left available for other human capital development (e.g. studying, playing) decresases with possible negative consequences on the child's future outcomes. Other studies that analyse the impact of conflict on education find long-term negative effects of violent conflict on school enrollment, school attainment and also on school drop-out (inter alia Akresh and De Walque [2008] for Rwanda; Chamarbagwala and Morán [2011], for Guatemala; Leon [2012] for Peru; Shemyakina [2011b] for Tajikistan; Swee et al. [2009] for Bosnia and Herzegovina; Rodriguez and Sanchez [2012] for Colombia). The decrease in the years of education might be another channel through which we might expect conflict to increase the number of hours worked by children. Some studies in the wider literature analyse the responsiveness of hours of child labour to changes in adult wages. For example, Ray [2000] finds that the impact of changes in adult wages on hours of child labour differs in Peru and Pakistan. In Peru rising male wages significantly reduce the labour hours of girls, while in Pakistan rising female wages have a large and significantly positive impact on girls' labour hours.

Afghanistan is one of the countries with the highest incidence of child labour. According to the data used in this study about 13.8% of children between 6 and 12 years old and about 32.7% of children between 13 and 15 years old were in work[1] between 2007 and 2008. This percentages are quite high when compared to those reported by the International Labour Organization (ILO) (see progress against child labour Global [2013]) who reports a worldwide child labour rate of 10.6% in 2012. Even though Afghanistan has made some legislative commitments in the past two decades, [2], child labour still accounts for one of the largest problems in the country. As chapter 1 shows, conflict has persisted in Afghanistan since the early 1980s, changing in intensity over time, and the high level of insecurity represents a major impediment to development [Akresh and De Walque, 2008]. The child labour phenomena has been widely analysed both theoretically and empirically in

[1] These percentages exclude domestic work

[2] In 2013, Afghanistan made a moderate advancement in efforts to eliminate the worst forms of child labour. The Government of Afghanistan announced the adoption of a list of 29 jobs/working conditions prohibited for children

the recent literature. Theoretically, a key reference point in the literature is Basu and Van [1998] and the most recent literature on the topic is summarized in Edmonds [2007] and Bar and Basu [2009].

This paper aims at identifying the causal impact of conflict on both the extensive and the intensive margin of child labour supply for 6-15 years old children during the period 2007-2008. It distinguishes both domestic and non-domestic hours worked and looks for heterogeneous effects across gender and different class ages. Morever, this chapter exploits a district level conflict variation and looks at direct, local area specific conflict effects rather than the indirect conflict effects examined by Di Maio and Nandi [2013] and does not look just at schooling versus working decisions when compared to Rodriguez and Sanchez [2012].

Which *mechanisms* could drive an increase in child labour during conflict? I explore the following mechanisms that coud drive the increase in child labour because of conflict.

Households may use child labour to *insure* against the decrease in consumption due to conflict. The relationship between conflict and child labour can be positive when the marginal benefit of child labour under conflict is greater than its marginal cost[3]. For example, in the scenario where conflict makes households poorer the marginal benefit of child labour for household subsistance increases, or where sending children to work has a higher marginal benefit for the household than investing in their education in an uncertain conflict environment.

Conflict could also increase child labour as a result of *re-allocating the labour supply within the household* and *across economic sectors* [4]. It could be the case that in conflict-ridden districts male adults were involved in war-related activities and that because of cultural constraints children rather than women were asked to replace them on the labour market. Then, the increase in child labour could be due to an increase in child labour-intensive economic sectors.

Finally, it could be that in times of war children do *not attend school* because

[3]The child labour phenomena has been widely analysed both theoretically and empirically in the recent literature. Theoretically, a key reference point in the literature is Basu and Van [1998] and the most recent literature on the topic is summarized in Edmonds [2007] and Bar and Basu [2009].

[4]Other studies, among which **?**, suggest that higher conflict intensity increases private economic activity. This could be a channel through which conflict increases both the intensive and the extensive margin of child labour supply.

either because of security reasons or because they have to work in order to guarantee the household's survival. Falls in time spent in education might be another channel through which we might expect conflict to increase the number of hours worked by children. Most studies look at how conflict affects school enrollment and attainment. The empirical evidence on the effect of armed conflict on children' s schooling is mixed. Some studies find that conflicts have small impacts on the outcomes of interest (for instance Chen et al. [2008b]). Others tend to find long-term negative effects of violent conflict on school enrollment, school attainment and also on school drop-out (inter alia Akresh and De Walque [2008] for Rwanda; Chamarbagwala and Morán [2011], for Guatemala; Leon [2012] for Peru; Shemyakina [2011b] for Tajikistan; Swee et al. [2009] for Bosnia and Herzegovina; Rodriguez and Sanchez [2012] for Colombia). There is also a growing literature on the gender-specific effect of armed conflict on schooling that finds diverse effects. However, several studies suggest conflicting findings. Chamarbagwala and Morán [2011], Shemyakina [2011b] and Walsh [2000] find that exposure to civil conflict causes a larger negative impact on the enrolment of girls as opposed to boys in different countries. The reasons givent to explain why this effect was more pronounced for females than for males is that expected returns to education for girls are generally lower and security fears higher than for boys. Other studies such as Swee et al. [2009], and Kecmanovic [2013] instead find that the negative effect on schooling is driven by males. Recently, Singh and Shemyakina [2013], explored the long-run effects of the 1981-1993 Punjab Insurgency on the educational attainment of adults. The authors find a significant reduction in expenditure on education by households with a high ratio of girls to boys and those residing in violence affected districts, which suggests that this reduction was one of the demand-side channels through which conflict affected education.

However, education is a different outcome than work. It could be that children just drop out from school but do not go to work. In this scenario, conflict might have a negative impact on children's returns to schooling (decrease human capital), but could not have any other impact on any other measure of children development such as health. In fact, education measures just the loss in terms of human capital conflict could cause to children. Thus, it is important to look at the impact of conflict on children working.

Overall, the findings suggest that the *necessity* hypothesis is the driver of the increase in children labour supply and that female children are those most affected by the increase in conflict intensity. However, the childen entering the labour supply because of conflict work more in a protected environment, the household dwellings, while no significant effect is found on hazardous type of work (construction and quarrying). The chapter is structured as follows. Section 1 introduces the topic and summarizes the relevant literature review, Section 2 describes the theoretical framework, Section 3 shows the methodology, Section 4 presents the results. The findings on the extensive margin show that conflict[5] significantly increases the probability of a female child of being working of about 7% points and suggest that all the increase in child labour is significantly is driven just by younger females. The results relative to the intensive margin instead show a decrease of about 0.48 average non-domestic hours worked per day in the past week (about half an hour per day) which is significant just for females. Even in this case the results are mainly driven by younger females (decrease of about 0.5 average hours per day). Section 5 concludes.

Child labour

Currently, the International Labour Organization (ILO) provides a broad international definition of child labour[6].

The child labour phenomena has been widely analysed both theoretically and empirically in the recent literature. Theoretically, the literature suggests that households value the marginal benefit of child labour to the household - rather than the child - more than its marginal cost (see Basu and Van [1998]). However, the empirical literature has not reached a consensus on the relationship between poverty and child labour (see Dar et al. [2002]). In fact, according to the recent literature there are several other important socio-economic determinants of the existence of child labour such as the influence of local labour markets, family interactions, the

[5] One conflict per 1000 inhabitants in a district

[6] The current criteria for identifying child labour used by the ILO's Statistical Information and Monitoring Program on Child Labour (SIMPOC) for its global child labour estimates is: A child under 12 who is economically active for 1 or more hours per week, A child 14 and under who is economically active for at least 14 hours per week, A child 17 and under who is economically active for at least 43 hours per week A child 17 and under who participates in activities that are "hazardous by nature or circumstance" for 1 or more hours per week A child 17 and under who participates in an "unconditional worst form of child labour" such as trafficked children, children in bondage or forced labour, armed conflict, prostitution, pornography, illicit activities (see Edmonds [2008].

net return to schooling, and poverty (Bhatty [1998] and Lieten [2000]).

Child labour can be both positively and negatively affected by local labour markets characteristics, even if the literature provides little evidence about the channels through which labour market influences operate. Goldin and Sokoloff [1982] found that during an early industrialisation period there was a higher level of child labour with respect to other stages of economic development. In more contemporary settings the literature has explored the relationship between changes in the activities for children and the industrial composition of the local labour market. Edmonds [2003] found that hours worked by children are slightly longer in Vietnamese communities with significant small employer presence. He also observes very little association between the activities of children and a variation in other types of workplace organisations (over time or between locations). Other authors found that there are some activities where children may had a competitive advantage such as English cotton mills in the nineteenth century Galbi [1997] and wood collection (Nankhuni and Findeis [2004]). Recent studies noticed that children work more in households with more self-employed activities (Edmonds and Turk [2002], for Vietnam, Parikh and Sadoulet [2005] in Brazil). Technological changes can replace the type of activities done by children. Brown et al. [1992] observe this to be the case for the canning industry in the U.S. while Levy [1985] observes a similar association for the Egyptian cotton industry. Other authors found that trade instead can increase child labour, creating work opportunities for children that would otherwise not be present see Maskus [1997] and Edmonds et al. [2007].

Child labour is also affected by family interactions. The literature presents different views on who makes child labour decisions within the household. Edmond and Sharma found that decisions about child time allocation will be influenced by mothers, fathers, extended family and perhaps even children themselves. Basu [2006] considers how the status of women in the household affects child labour supply. Interestingly, he finds that as female status improves the family opts for less child labour as it is more difficult to take a decision to send a child to work if there is disagreement among parents. However, when the mother becomes dominant in the household, child labour is found to increase as the mother can exert more influence over consumption choices, increasing household demand for consumption of

other goods. This could increase household expenditures and push the household to find solutions, such as child labour, in order to to increase household disposable income. The strongest evidence of complementarities between parental and child work comes from the U.S. Goldin and Parsons [1981] and Goldin [1979] found that children (rather than wives) were the most common source of labour income apart from the male household head. Skoufias [1993], Wahba [2006] in Egypt and Katz [1995] in Guatemala instead, found evidence of mother-daughter sex substitution patterns. Under certain circumstances, child labour may be a substitute for parents work. In particular children can substitute for adult females at work when the household lacks adult male workers. Hunte and Winterbotham [2009] finds that in Afghanistan, households which lack adult male workers, because of death, disability, migration or the seclusion of adult females in the family due to religious constraints and their subsequent inability to find productive work, contain children who are more likely to work.

In Afghanistan there here is evidence of how the entrance of women into the labour market can be constrained by gender-specific law restrictions that can exclude them from some labour market activities. Recently, Noury and Speciale [2013] found that growing up under the Taliban rule (1996-2001) in Afghanistan negatively affects educational attainment and labour market outcomes of Afghan women. They find that women who were exposed to radical religious rule during school age are less likely to be employed outside the household and more likely to have an agricultural job, within the household, which is often an unpaid job and that the labour market (education) consequences are larger (smaller) in absolute value in the capital, Kabul. The results for Kabul can be explained both from the fact that the broader availability of wage-jobs and employment outside the household in the capital implies that a larger share of women exposed to the Taliban rule during school age could switch from these types of occupations to employment within the household, and also from the fact that the Taliban enforced restrictions more strictly in the Afghan capital than in other districts. Singh et al. [1986] indicate that with no labour market opportunities for women outside of the household, the type and the amount of work that a woman does will be constrained by her households production opportunities and characteristics such as the amount of land and other productive assets the household

owns and the number of skills of other household members who are available to work in a family enterprise. Goldin [1994] argues that if women in low-income countries are mostly confined to work in family enterprises, economic development that comes in the form of new manufacturing sector may improve economic opportunities for men relative to women.

There is a little evidence on the role of an individual child in deciding their own labour supply. Iversen [2002], finds that in south Indian districts, early teen migrants may have migrated and work in order to have greater control over their lives. The effects of parental death on child work are not clear. Guarcello et al. [2005] and Case et al. [2004] find positive correlations between parental death and various forms of child work. Sibling composition can also affect child labour e.g. Manacorda [2006] finds that children are less likely to work when they have older siblings.

The literature also supports the existence of an inverse relationship between child labour and returns to schooling. E.g. Chamarbagwala and Morán [2011] observes that Indian children in regions with higher returns to education are more likely to attend school and less likely to work.

Finally, the challange of studying the link between economic status and child labour is that poor households can be different from rich households in many ways that might be associated with child labour. The empirical findings seem to suggest that parents choose to use child labour more to cope with poverty than to reduce their workload see Manacorda [2006] finds that a rise in the proportion of working children by household in the U.S. is associated with no variation in parents labour supply, suggesting that parents are altruistic. Also Basu and Van [1998] and Edmonds [2005] find that when children work as a mass phenomenon as in many less developed countries, it is much more likely that this reflects not a difference in the attitude of their parents but the problem of stark poverty where the parents have to send the children to work for reasons of survival.

Child labour and conflict

The relationship between conflict and child labour can be positive when the marginal benefit of child labour under conflict is greater than its marginal cost. For

example, in the scenario where conflict makes households poorer the marginal benefit of child labour for household subsistance increases, or where sending children to work has a higher marginal benefit for the household than investing in their education in an uncertain conflict environment. The determinants of child labour on which we do expect conflict to have an impact are changes in schooling decisions, changes in labour markets opportunities, in the intra-household labour supply and in the level of households wealth.

Currently, the only papers that aim at estimating the impact of conflict on child labour available agree on the existence of a positive causal relationship between conflict and child labour. Di Maio and Nandi [2013] find that an increase in the number of days of closure between Israel and Palestinian Territories increased child labour while it (weakly) reduced school attendance in the West Bank. Rodriguez and Sanchez [2012], show that the conflict increases child labour by inducing them to drop out of school and enter the labour market early using data for Colombia. However, there are still margins for improvement when exploring the causal relationship between child labour and conflict.

This study is the first contribution in the child labour literature that focuses on the impact of conflict on the intensive margin of child labour supply and one of the few contributions in the economic literature that looks at the impact of conflict on child labour. Morever, this chapter exploits a district level conflict variation and looks at direct, local area specific conflict effects rather than the indirect conflict effects examined by Di Maio and Nandi [2013] and does not look just at schooling vs. working decisions when compared to Rodriguez and Sanchez [2012].

This chapter uses the same unique individual level dataset obtained by merging information at the district level from the National Risk and Vulnerability Assessment (NRVA) survey and conflict data that were publicly made available by the Afghan War Diary as Chapter 1, but now with a focus on child labour. In addition to this I use time series conflict data made available by the Global Dataset on Events, Location and Tone (GDELT). Information on the number of individual, household and district characteristics are used as controls in studying how the intensity of the Afghan conflict is related to child labour in Afghanistan.

2.2 The Model

I present a stylized model of household labor supply with child labor extending the one used in Manacorda [2006]. Consider a household H composed of N_{CH} children (denoted by C_i,$i = 1, ...N_{CH}$), a father (denoted by F) and a mother (denoted by M). Suppose that each individual j's (either a child's or a parent's) utility depends on the consumption of two goods: some public good E_H, and own leisure $(1 - e_{jH})$, where $0 <= e_{jH} < 1$ denotes work, with 1 being the endowment.

Assume that parents maximize some linear combination of their children's and their own individual utilities according to CRTS Cobb-Douglas with α_C/N_{CH} being the weight that parents attach to each child's leisure and α_F/N_{CH} and α_M/N_{CH} respectively the father's and mother's utility of work.

In the model, wages are a decreasing function of conflict with w'(C)<0. e_{CiH}, e_{FH}, e_{MH} is the number of hours worked by the child, the father and the mother.

$$U(C)_H = [lnE_H(C) + \alpha_F ln(1 - e_{FH}(C) + \\ + \alpha_M ln(1 - e_{MH}(C)) + \alpha_C \sum_i ln(1 - e_{CiH}(C))]/N_{CH}$$

subject to the budget constraint:

$$E_H(C) = \sum_i w_{CiH}(C)e_{CiH}(C) + w_{FH}(C)e_{FH}(C) + w_{MH}(C)e_{MH}(C) + Y_H \quad (2.1)$$

and the time constraints. Y_H denotes household unearned income. In equilibrium d_{PH} and d_{CiH} represent each individual's labour force participation decisions that depend on the individual's wage, some measure of the disutility of work α_j/A_H and per-child household income $E_{CH} * (C)$.

$$d_{PH} = I(e_{PH} > 0) = I(w_{PH}(C) > \alpha_P E_{CH} * (C)/A_H)P = F, M \quad (2.2)$$

$$d_{CiH} = I(e_{CiH} > 0) = I(w_{CiH}(C) > \alpha_C E_{CH} * (C)/A_H) i = 1, ...N_{CH} \quad (2.3)$$

Where $E_{CH} * (C)$ is the household income per-child:

$$E_{CH} * (C) = (\sum_i w_{CiH}(C) d_{CiH} + w_{FH}(C) d_{FH} + w_{MH}(C) d_{MH} + Y_H)/N_{CH} \quad (2.4)$$

The number of hours worked by children and adults depends on the household income ($E_{CH} * (C)$). The household income is a function of conflict intensity (C), higher conflict decreases the household income. The impact on the number of hours worked might be either positive or negative. Positive, if the income effect prevails (households feel poorer, so both children and adults work more), negative if the substitution effect prevails (households increase leisure and work less hours as the opportunity cost of working decreases).

2.3 Methodology

2.3.1 Data

The dataset used here combines household information on child labour from the National Risk and Vulnerability Assessment (NRVA) 2007 - 2008, conflict data from the Afghan War Diary (AWD) and from the Global Data on Events, Location and Tone (GDELT). The dataset is described in chapter 1 on pages 28-32.

The definitions of child labour, extensive and intensive margin are listed below and are given in section 9a of the NRVA 2007/8 survey questionnaire.

The children in the sample are those between 6-15 years old. The data include both information on if the child is working or not (extensive margin of child labour supply) and information on how many hours the child is working.

- *Extensive margin*: It is defined by a dummy variable that describes if a child is working or not. In the NRVA questionnaire the question used in order to define this variable is 'Did this child do any work for pay during the past week, or did

the child help with a family business or handicrafts or assist with agriculture or livestock or collect things in the street for household use?' (question 9.2)

- *Intensive margin*: It is defined by a dummy variable that describes the number of hours worked. The analysis distinguishes:
  - *Domestic hours worked*: They are defined as the average number of hours per day worked by the child in the past 7 days doing household chores. In the NRVA questionnaire the question used in order to define this variable is 'In the past 7 days how many hours in total did he/she work on household chores, or tending children, cooking, fetching water or other household chores?' (question 9.7)
  - *Non-domestic hours worked*: They are defined as the average number of hours per day worked by the child in the past 7 days. The survey question does not distinguish domestic-non-domestic, but from the order of the questions in the questionnaire and the distributions it seems clear that this variable excludes the number of hours dedicated to the household chores. 'In the past 7 days on average how many hours per day did he/she work?' (question 9.6)
- *Conflict*: Number of conflicts in a district normalised by population

2.3.2 Data description

Control variables

The variables used for the analysis are listed in Table 2.1.

The model specification includes both household controls, child level controls and finally district level controls. The latter are also introduced as it was not possible to introduce in the model either province or district fixed effects, as they capture most of the variation of the conflict variable.

The household control variables chosen are those that are supposed to have an impact on child labor according to the available literature. The analysis includes dummies for the household size, that could capture non-linearities in the impact of the household size on child labour. The model specification also includes information

on gender, literacy and age of the household head and the level of education of the mother and the father as these characteristics could determine the household decisions of sending children to work or not. Also the average age in the household, the male adults share, the share of female adults in work could play a role in the household decisions (e.g. a household which is composed mainly by old household members might be more prone to send children to work). In the regression are also taken into account shocks experienced in the previous year (just exogenous natural disasters such as floods, earthquakes etc.), number of assets such as radio and TV that could be a proxy for household wealth, electricity and the receipt of remittances. Shocks could increase child labour if households send children to work as a coping strategy, while receiving remittances could make the household wealthier and reduce the necessity of sending children to work. The children characteristics I control for are sex and age. Finally, I control for district level covariates in order to keep into account the geographical variation in average age, share of male adults, share of rural communities in the district and average number of households whose first source of income is opium cultivation, as opium cultivation could affect both child labour and conflict. Variables that describe the availability of infrastructures and markets are added later on as a robustness check due to potential endogeneity concerns.

Table 2.1: **Variable descriptions**

Variables	Description
Household variables	
2-5 household members (Dummy)	Equal to 1 if HH members are less than 2, 0 otherwise
5-10 household members (Dummy)	Equal to 1 if HH members are less than 5, 0 otherwise
10-15 household members (Dummy)	Equal to 1 if HH members are less than 10, 0 otherwise
15-20 household members (Dummy)	Equal to 1 if HH members are less than 15, 0 otherwise
>20 household members (Dummy)	Equal to 1 if HH members are less than 20, 0 otherwise
Male head (dummy)	Equal to 1 if the household head is a male, 0 otherwise
Age of the household head	Age of the HH head
Avg. age in the household	Average age of the HH members
Literacy of the household head (Dummy)	Equal to 1 if the HH head is literate, 0 otherwise
Male adults share	Male adults share in the household
Household literacy (Dummy)	Share of literate members of the HH
Rural (Dummy)	Equal to 1 if the HH lives in a rural area, 0 otherwise
Household assets	Number of assets in the HH
Shocks (Dummy)	Equal to 1 if the HH experienced a shock in the previous year, 0 otherwise
Remittances (Dummy)	Equal to 1 if the HH received any remittance in the past year, 0 otherwise
Household migration (Dummy)	Equal to 1 if any HH member migrated in the past year, 0 otherwise
Market close (Dummy)	Equal to 1 if the HH is close to the market, 0 otherwise
Road Km	N. of Km to the closest road
Share of female adults in work	Share of female adults that worked (even unpaid) in the last 30 days
Individual variables	
Age	Age of the individual
Sex (Dummy)	Sex of the individual
Domestic hours worked	Average n. of domestic hours worked by the child per day in the past 7 days by the child on household chores, or tending children, cooking, fetching water or other household chores
Hours worked	Average n. of hours worked by the child per day in the past 7 days
Child works (Dummy)	Equal to 1 if the child works, 0 otherwise
Adult employment ratio	Share of adults working in the household
Adult employment ratio (males)	Share of male adults working in the household
Adult employment ratio (females)	Share of female adults working in the household
School enrolment (Dummy)	Equal to 1 if the child is enrolled in school, 0 otherwise
School enrolment missing (Dummy)	Equal to 1 if the school enrolment dummy is missing, 0 otherwise
Food consumption (in Kg.)	Food consumption in Kgs.
Works in the house (Dummy)	Equal to 1 if the child works in the house
Works in agric. (Dummy)	Equal to 1 if the child works in agriculture
Works in hazardous activity (Dummy)	Equal to 1 if the child works in a hazardous activity
Works in a shop (Dummy)	Equal to 1 if the child works in a shop
Works in other activities (Dummy)	Equal to 1 if the child works in other activities
Distance to Pakistan	Distance from the household to Pakistan in Km.
Conflict variables	
N. of conflicts	Number of conflict events in the district [7]
N. of wounded/killed	Number of conflict events with wounded/killed in the district [8]
Instrumental variable	
IV	Number of conflict events in the district from 1979-1989 (GDELT data)[9]
District variables	
% of rural communities	Share of rural communities in the district
% of households with opium cultivation as a main income	Average number of households whose first source of income is opium cultivation
Avg. age	Average age in the district
% of males	Share of males in the district
% of literate adults	Share of literate adults in the district
District infrastructures	
Avg. distance from the main road	Average distance from the households in the district to the main road (in Km)
Avg. distance from the market	Equal to 1 if the household can reach the market within one hour

Table 2.2 below presents the descriptive statistics on child labour in the sample by gender and per class age (6-12, 13-15).

Table 2.2: **Percentage of children working**

	Total			Males			Females		
	Total	High conflict	Low conflict	Total	High conflict	Low conflict	Total	High conflict	Low conflict
Class age									
6-12	13.3	18.9	13.7	8.5	11.5	8.6	4.8	7.5	5.3
13-15	31.9	42.3	35.6	20.8	27.4	22.1	11.1	15.3	13.4

In 2007-2008, about 18% of children between 6 and 15 years old were in work. This share is higher, 24.3%, when considering just high conflict intensity areas, and lower, about 19.1%, when looking at low conflict intensity areas [10]. The percentage of children working is even higher when looking at middle school age (between 13 and 15 years old) (31.9 %). Again, the share of older children working is higher in high conflict level areas than in lower conflict level ones. There are also significant gender differences, as the share of boys participating to the labour force almost doubles the females one in both the class ages. As already mentioned in the previous paragraphs, this percentages are quite high when compared to the ones reported by the International Labour Organization (ILO) (see progress against child labour Global [2013]) that reports in 2012 a 10.6% of child labour in the 5-17 years age group in the world.

Table 2.3 below shows the descriptive statistics on child labour in the sample by gender and type of work. The majority of the children in the sample work in agriculture, followed by a 39.2% that works at the household dwellings. However, there are significant gender differences in the distribution of the occupations. 70.6% of the girls in the sample works at the household dwellings while only a 21% works in agriculture. Boys instead, mostly work in agriculture (51%) followed by a 22.2% that works at the household dwellings.

[10] High is defined as the top 25^{th} percentile of the conflict distribuition, low instead is defined as the lowest quartile.

Table 2.3: **Percentage of children working by type of activity**

Type of activity	Total	Males	Females
At the household dwelling	39.2	22.2	70.6
Employer's house	1.1	1.3	0.7
Formal Office	0.0	0.0	0.0
Factory	0.2	0.2	0.0
Plantations/farm/garden	40.6	51.1	21.0
Construction site	0.7	1.0	0.1
Quarrying sites	0.0	0.1	0.0
Shop/Market/ Kiosk/ Restaurant	4.9	7.3	0.4
On the street (selling or carrying things)	1.1	1.7	0.1
On the street (collecting things for household)	3.9	4.3	3.1
Other (specify)	8.0	10.4	3.5
Total	100.00	100.0	100.0

Table 2.6, 2.5, 2.4 show the average number of hours worked[11] per day by a child in the past week. Children worked on average 5 hours per day in non-domestic activities and 4 hours in domestic ones in the previous week. Both average domestic, non-domestic and total number of hours worked slightly decrease in higher conflict intensity areas compared to lower intensity ones. This average number of hours worked validates the definition of child labour given the definition provided in Diallo et al. [2013] as children between 5-11 years old are considered children working even if they work less than 43 hours per week and children between 12 and 14 years old if they work more than 14 hours per week (see the ILO classification of child labour in Figure 2.12.

Table 2.4: **N. of average total hours worked per day in the past week by sex, age and conflict intensity (conditional on the child working more than zero hours)**

	Total			Males			Females		
	Total	High conflict	Low conflict	Total	High conflict	Low conflict	Total	High conflict	Low conflict
Class age									
6-12	5.3	5.4	5.8	5.1	5.2	5.6	5.5	5.6	6.0
13-15	5.9	5.4	6.4	5.9	5.2	6.4	5.9	5.6	6.4

[11] Definition in Table 2.1

Table 2.5: **N. of average non-domestic hours worked per day in the past week by sex, age and conflict intensity (conditional on the child working more than zero hours)**

	Total			Males			Females		
	Total	High conflict	Low conflict	Total	High conflict	Low conflict	Total	High conflict	Low conflict
Class age									
6-12	3.8	4.0	4.0	3.9	4.0	4.1	3.7	4.0	3.9
13-15	4.2	3.9	4.5	4.5	3.9	4.8	3.8	3.7	4.1

Table 2.6: **N. of average domestic hours worked per day in the past week by sex, age and conflict intensity (conditional on the child working more than zero hours)**

	Total			Males			Females		
	Total	High conflict	Low conflict	Total	High conflict	Low conflict	Total	High conflict	Low conflict
Class age									
D6-12	1.5	1.4	1.7	1.3	1.2	1.5	1.8	5.6	6.4
D13-15	1.6	1.5	1.9	1.4	1.3	1.9	2.0	1.6	2.1

Figure 2.1: Daily average non-domestic hours worked in the past 7 days in both low and high conflict areas

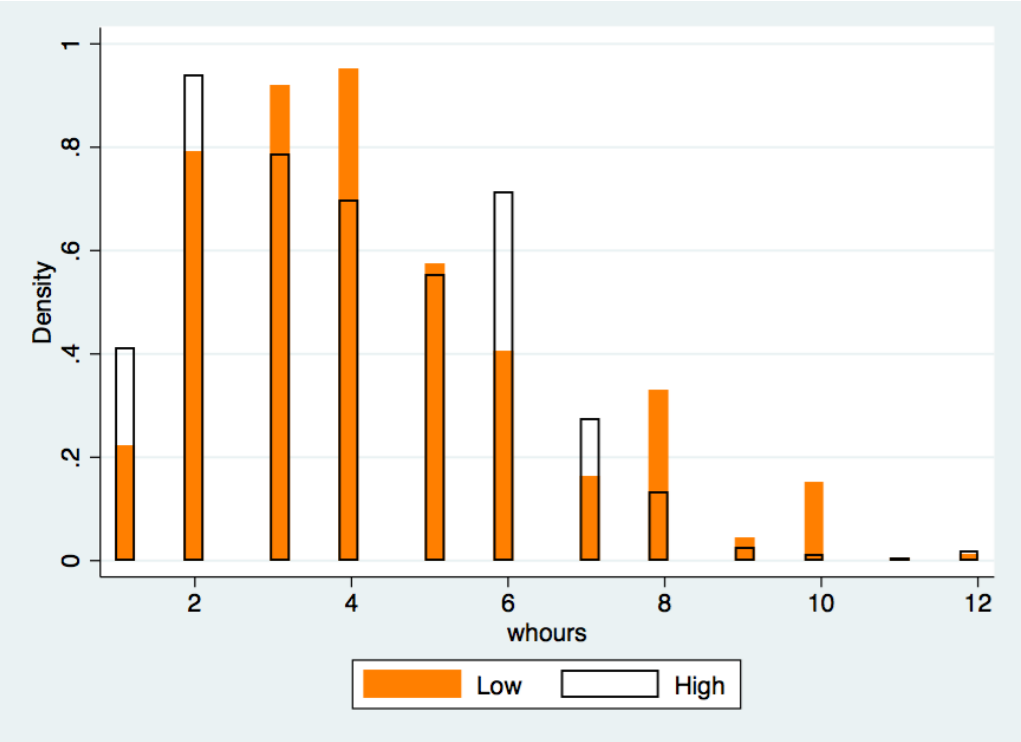


Figure 2.2: Daily average domestic hours worked in the past 7 days in both low and high conflict areas

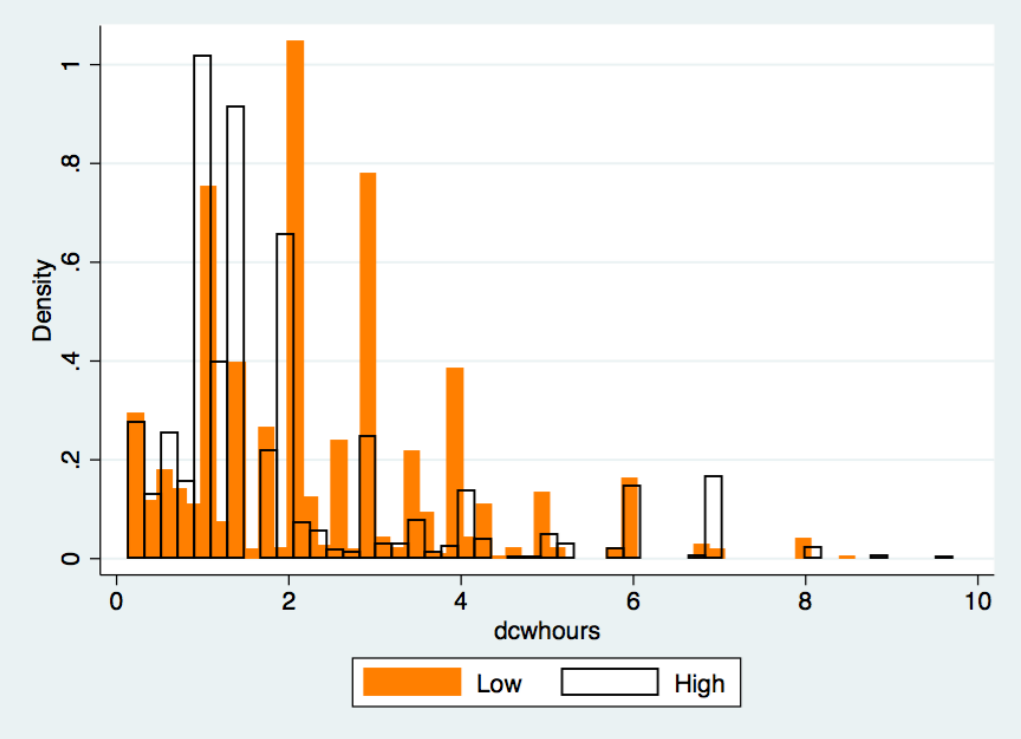


Figure 2.3: Daily average non-domestic hours worked in the past 7 days - Comparison between the whole sample and children working more than zero hours

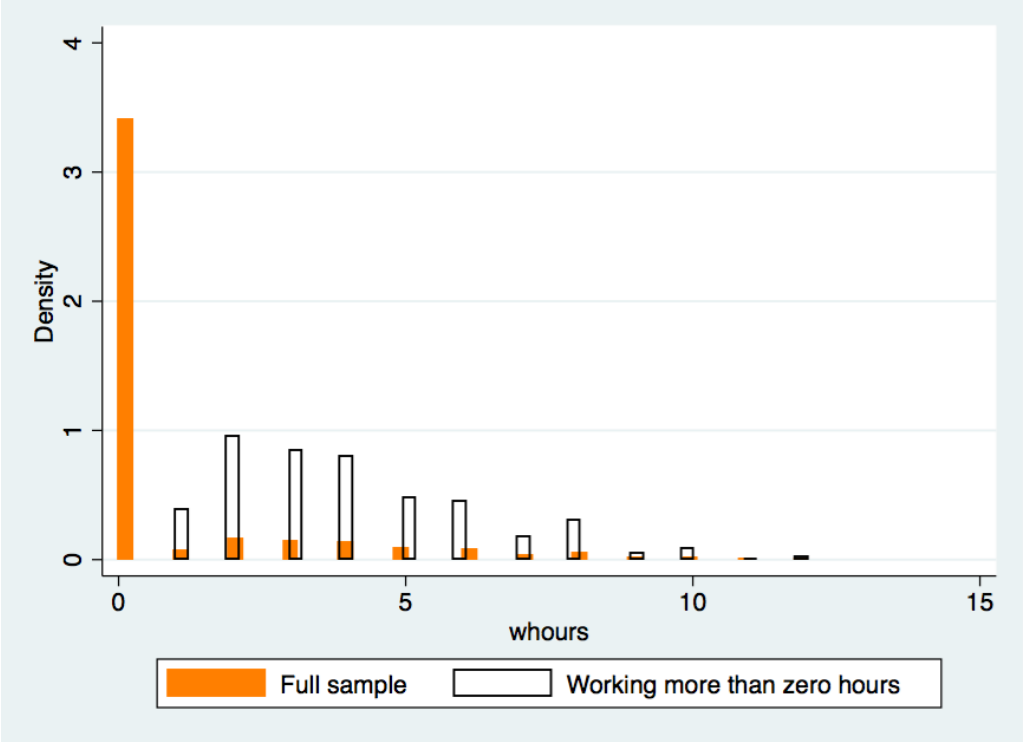


Figure 2.4: Daily average domestic hours worked in the past 7 days in both low and high conflict areas - Comparison between the whole sample and children working more than zero hours

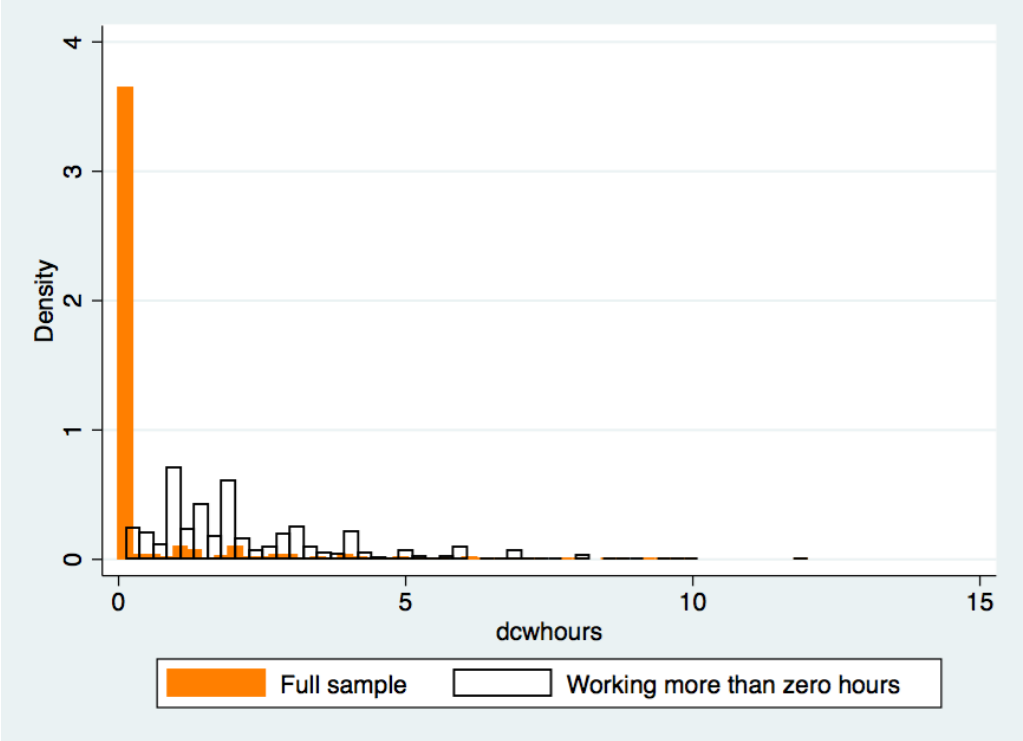


Figure 2.5 and Figure 2.8 show the correlations within districts between the outcome variables and conflict intensity. Both the average number of children and adults working are seen to increase with conflict intensity. Finally, Figure 2.9 and 2.11 show the correlation between the average number of children working and average conflict intensity in Afghan districts in 2007-2008. These figures are confirming the existence of a positive correlation both between child labour and conflict intensity and between average number of adults working and conflict intensity in Afghan districts in 2007/2008.

Figure 2.5: **Correlation between average child labour and average conflict intensity per district. Conflict intensity is normalised by population.**

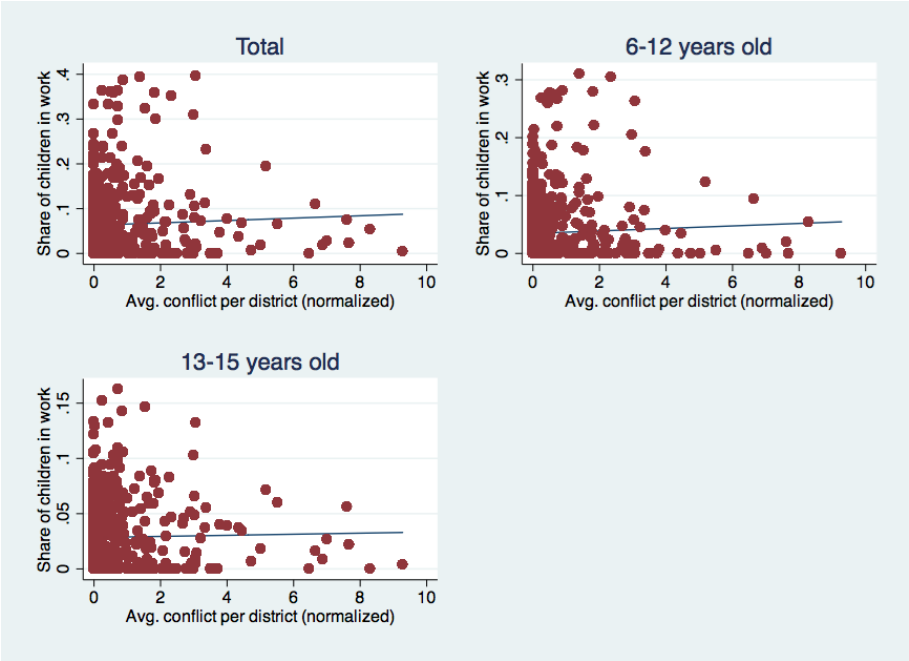


Figure 2.6: **Correlation between average female child labour and average conflict intensity per district. Conflict intensity is normalised by population.**

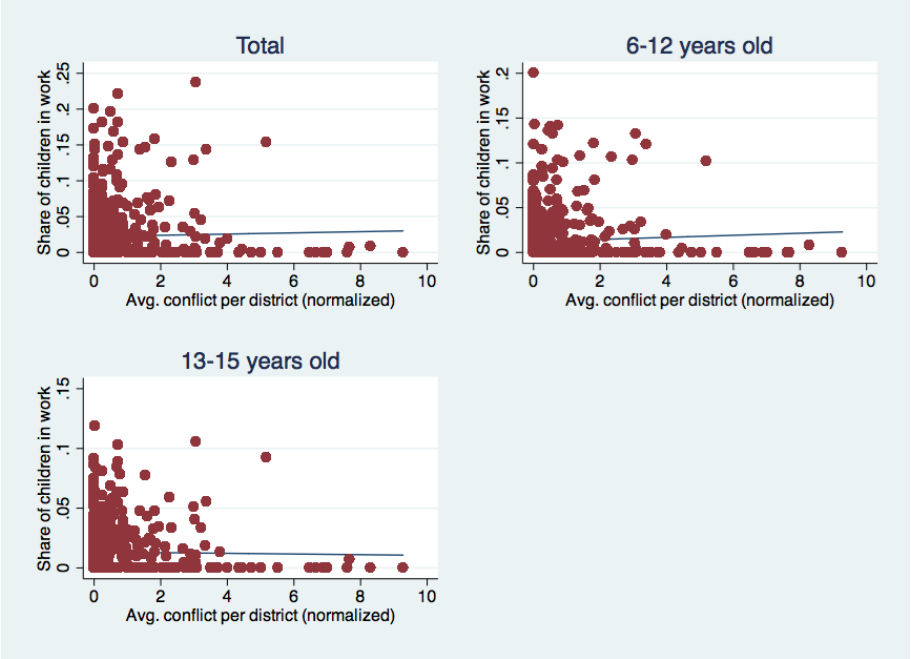


Figure 2.7: **Correlation between average male child labour and average conflict intensity per district. Conflict intensity is normalised by population.**

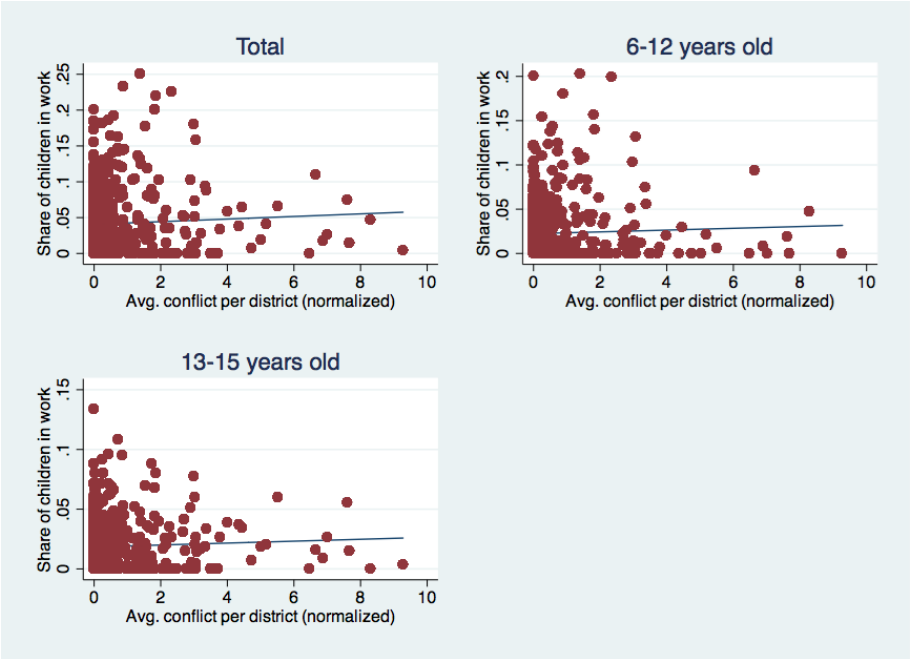


Figure 2.8: **Correlation between average adult labour and average conflict intensity per district. Conflict intensity is normalised by population.**

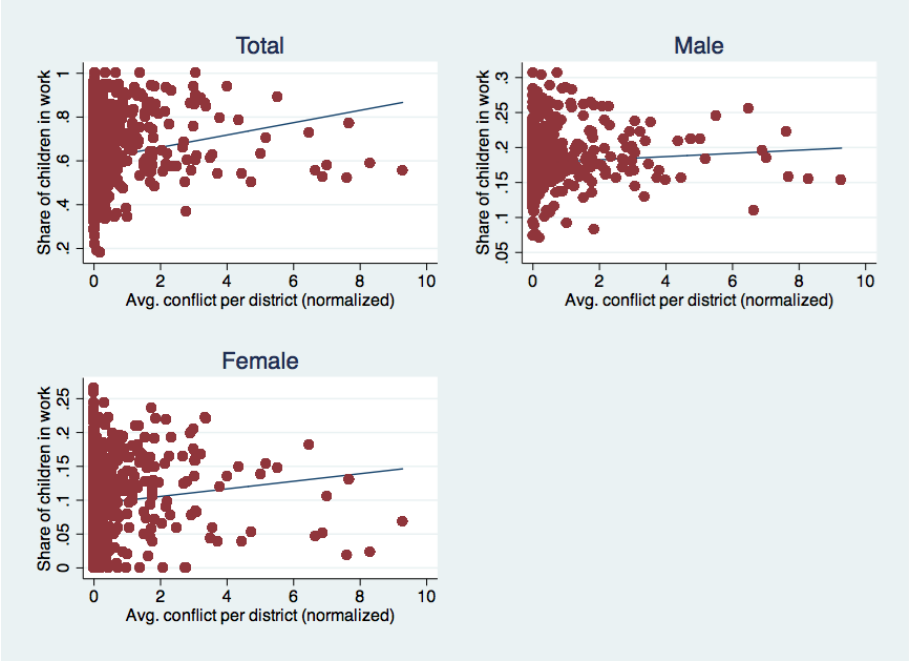


Figure 2.9: **Map of average conflict intensity 2007-2008. Conflict intensity is normalised by population (a unit of conflict is 1/1000 inhabitants).**

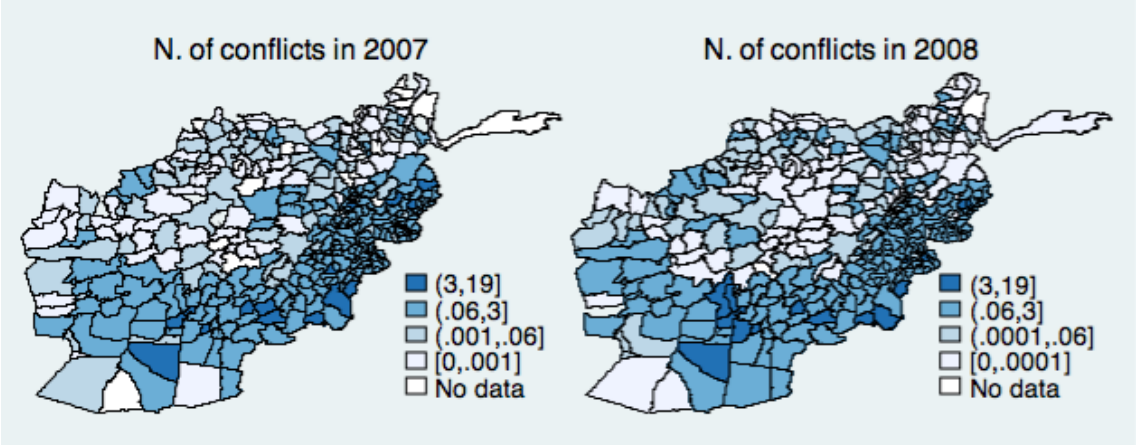


Figure 2.10: **Map of the average number of adults working per district. Total, males and females**

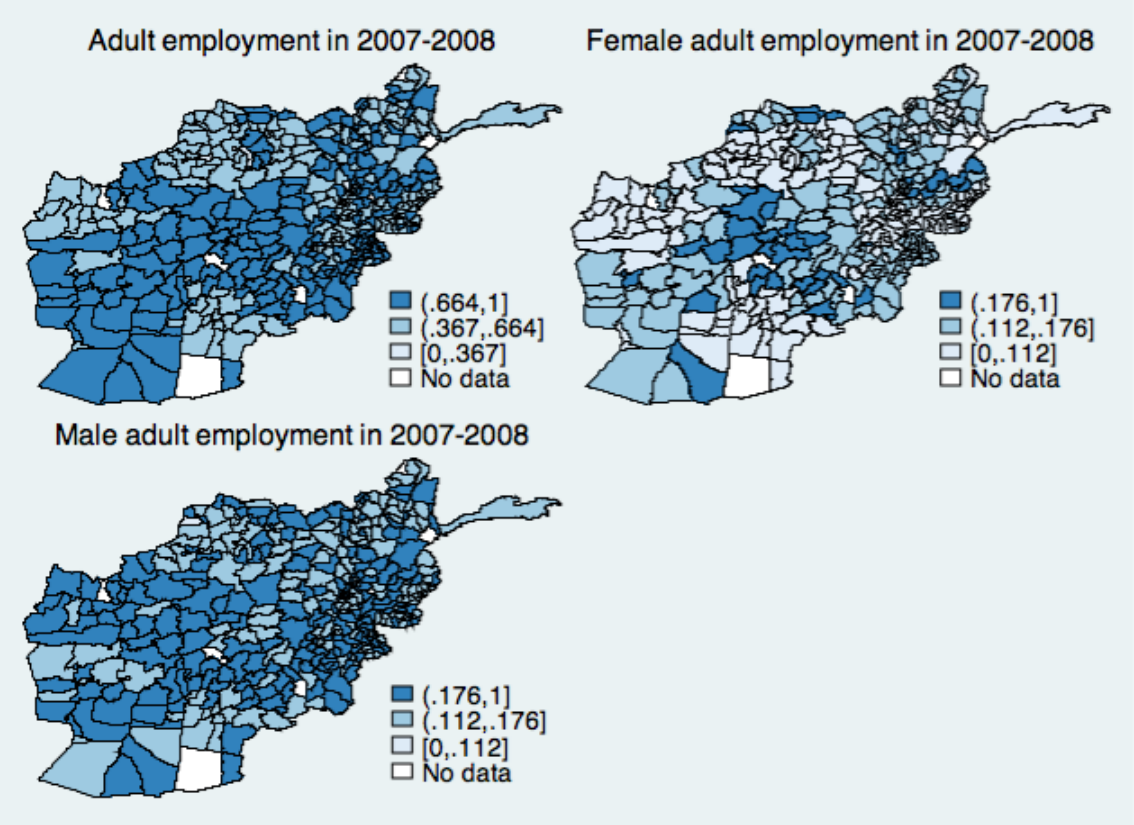


Figure 2.11: **Map of the share of children (6-15 years old) working per district. Total, males and females**

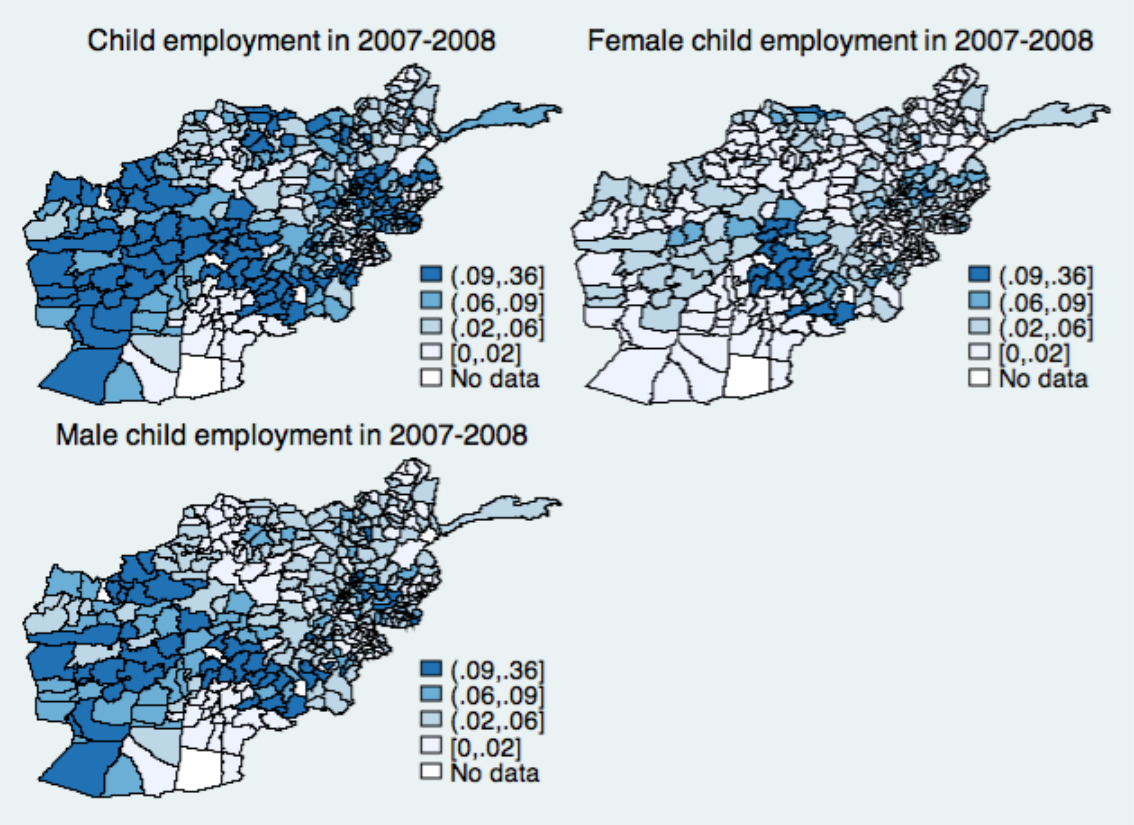


Table 2.7 shows the summary statistics for the sample used in the regressions. The share of children in work (including unpaid and domestic activities) in the sample is about 18%. The number of hours worked in the previous week is on average about 0.7 , while it drops to 0.27 when looking just at domestic hours worked. The children in the sample are on average about 10 years old and are gender balanced. Most of the households in the sample have between 5 and 10 household members (about 70% of the sample). Almost all the households have a male household head who on average is 44 years old and not literate. Most of the households live in rural communities (about 77% of the sample) and have an equal share of both male and female adults and of male and female children. Just a few households experienced the migration of an household member in the previous 12 months (about 7.5% of the sample). The average characteristics of the districts indicate that districts are composed by a large share (on average 80%) of rural communities. On average, about 16% of the households in the district declares to cultivate opium as a main household activity. The average age of household members in each district is about 20 years old and the share of literate household members is about 24%. The average distance by district from a household to the main road is about 3 km, while it is just 0.155 km when looking at the proximity of the market. In 2007/8 on average an Afghan district experienced 0.42 conflicts and 0.092 wounded or killed every 1000 inhabitants.

The next section, it is aimed at quantifying how exposure to conflict influenced child labour.

Table 2.7: **Summary statistics**

Variable	Mean	Std. Dev.	Min.	Max.	N
Child characteristics					
Working child (Dummy)	0.18	0.384	0	1	48440
N. of non-domestic hours worked	0.725	1.811	0	12	48440
N. of domestic hours worked	0.277	0.914	0	12	48440
Age	10.147	2.883	6	15	48440
Sex	0.519	0.5	0	1	48437
Household variables					
2-5 household members (Dummy)	0.167	0.021	0	1	48440
5-10 household members (Dummy)	0.085	0.279	0	1	48440
10-15 household members (Dummy)	0.685	0.465	0	1	48440
15-20 household members (Dummy)	0.171	0.377	0	1	48440
$>$ 20 HH Members (Dummy)	0.046	0.209	0	1	48440
Male head (Dummy)	0.984	0.125	0	1	48440
Age of the household head	44.862	12.287	4	99	48440
Avg. age in the HH	19.291	4.825	7.4	57.667	48440
Male children share	0.52	0.289	0	1	48440
Male adults ratio	0.502	0.138	0	1	48440
Literacy of the household head (Dummy)	0.038	0.06	0	0.5	48440
Rural (Dummy)	0.774	0.418	0	1	45487
Household assets	2.979	2.284	0	7	48440
Household migration	0.075	0.264	0	1	48298
Adult employment ratio	0.638	0.281	0	1	48712
Adult employment ratio (males)	0.805	0.302	0	1	48712
Adult employment ratio (females)	0.482	0.44	0	1	48712
School enrolment (Dummy)	0.473	0.499	0	1	48712
School enrolment missing (Dummy)	0.502	0.5	0	1	48712
Food consumption (in Kg.)	58.312	27.363	0	172.2	48712
Works in the house (Dummy)	0.073	0.259	0	1	48712
Works in agric. (Dummy)	0.075	0.264	0	1	48712
Works in hazardous activity (Dummy)	0.002	0.042	0	1	48712
Works in a shop (Dummy)	0.009	0.095	0	1	48712
Works in other activities (Dummy)	0.024	0.154	0	1	48712
Distance to Pakistan	1.812	1.536	0	5.587	48712
Variables at the district level					
% of rural communities	0.785	0.36	0	1	48440
% of HH with opium cultivation as main income source	0.162	0	1	48440	
Avg. age	19.716	1.332	12.619	25.588	48440
% of males	0.511	0.027	0.383	0.657	48440
% of literate adults	0.248	0.137	0	0.662	48440
Avg. distance from the HHs to the main road	2.769	11.067	0	293.614	48287
Avg. distance from the HHs to the main road (squared)	130.146	2837.149	0	86209.461	48287
Avg. distance from the HHs to the market	0.155	0.362	0	1	48440
N. of conflicts in the district normalised by pop. density	0.424	0.986	0	9.273	48271
N. of wounded/killed	0.092	0.213	0	1.765	48271
IV	0.215	1.495	0	39.892	48271

2.3.3 Estimation strategy

The estimation strategy relies both on a linear probability model when looking at the labour decision on the extensive margin, and on a tobit model censored at zero hours worked in the analysis of the intensive margin. I estimate the equation clustering standard errors at the district level in order to control for the group correlation of the error term within the districts.

The regression specification and the tobit model are described below:

At a child level:

$$Y_{ihd} = \alpha_1 + \alpha_2 Conf_d + \alpha_3 X_i + \alpha_4 X_h + \alpha_5 X_d + u_{ihd} \tag{2.5}$$

Where: Y_{ihd} is equal to 1 if child_adult i in the household h in district d is in work, 0 otherwise. In the second part of the analysis this is the number of hours (domestic ad non) worked by the child in the past week. $Conf$ is the number of conflict events per district (normalised by population); X_i are children characteristics, sex and age; X_h are household characteristics. In particular, how many young household members there are in certain age windows, if the household head is a male, age of the household head, average age of the household, percentage of males in the household, male children ratio, male adults ratio, household literature, household size, if the household lives in a rural area, number of household assets, dummy equal to one if someone in the household migrated during the previous year.X_d are district characteristics such as the average number of rural communities in the district, average number of households that have an illegal activity as a main income generating activity, average age of household members in the district, percentage of males in the district, average adult literacy in the district.

$$Y_{ihd} = \begin{cases} 0 & (Y_{ihd}* < 0) \\ Y_{ihd}* & (Y_{ihd}* \geq 0) \end{cases}$$

$$Y_{ihd}* = \alpha_1 + \alpha_2 X_{idt} + u_{ihd}, u_{ihd} \sim N(0, \sigma^2) \tag{2.6}$$

where $Y_{ihd}*$ is a latent variable.

2.3.4 Identification strategy

The identification of the causal effect of conflict on child labour means addressing the endogeneity of conflict. Endogeneity could be driven by omitted variable bias. It is possible that poorer areas are both more affected by conflict and have higher number of children working, or that a Taliban district is both more prone to higher conflict intensity and to higher incidence of child labour. Secondly, our coefficient of interest could also be biased due to measurement error as it is possible that the measure of conflict is imprecise.

Currently, the only papers that aim at estimating the impact of conflict on child labour available are Di Maio and Nandi [2013] and Rodriguez and Sanchez [2012].

Di Maio and Nandi [2013] identifies the impact of conflict on child labour and school attendance in the West Bank exploiting an exogenous indirect measure of conflict: the number of days of closure between Israel and Palestinian Territories.

Rodriguez and Sanchez [2012], show that the conflict increases child labour by inducing them to drop out of school and enter the labour market early using data for Colombia. In order to solve the endogeneity problem they use an instrumental variable approach was undertaken using two different available instruments: the average of two year lagged antinarcotics operations at the municipality level and of homicide captures at the state level interacted with municipal population. It is expected then that higher number of antinarcotics operations in a given municipality will necessarily imply a higher presence of the army and lower levels of income for the armed groups. Hence, the possibility for irregular armed groups to perpetrate attacks should diminish. Similarly, homicide captures will be a proxy for the efficiency and strength of the law enforcement in each municipality. For both variables, the two year lags were chosen given that the effect of the rule of law on violence in a particular zone takes time and probably more than one year of State presence is necessary to reduce armed conflict. The identification assumption used in the paper is hence that lagged deterrence measures should not be directly related with current schooling investment decisions at the household level. Even though this is a highly plausible assumption, they include evidence on their relevance and possible exogeneity.

In this study the potential bias due to omitted variables and measurement error is addressed both controlling for a quite large number of individual, household and district controls, and using the instrumental variable also used in chapter one.

Similarly to Bartel [1989], Altonji and Card [1991b], Saiz [2003], and others with regard to immigration patterns, it is assumed that conflict events are more likely to locate where earlier conflicts happened. Therefore, the share of conflict per district between 1979-1989 during the Soviet occupation it is taken and it is attributed to each district the share of Afghan global conflict of that period. This allows to construct an imputed conflict measure for district which it is used as an IV (see the full the description of the IV in chapter one, pages 61-64).

In order to instrument for conflict the instrumental variable has to be strongly correlated with the district-level variation over time in conflict intensity (relevance condition) and, at the same time, it has to be properly excluded from the second stage regression, i.e., it should affect child labour only through its effect on the conflict intensity variable, not directly (exogeneity or exclusion condition).

The relevance of the instrument (the first stage-correlation), is measured by the magnitude of the F-tests available in Panel A of the tables in Section 2.4, which is safely above 10. This suggests that past conflict shares might be correlated with the current ones because of exogenous geographical factors (such as accessibility, position, etc.). These factors make a given district more or less likely to be affected by conflict events where the overall conflict intensity in the whole country increases.

In order for the instrument to be valid, also the exclusion restriction has to be satisfied. It is realistic to assume that the exclusion restriction holds in this context after ruling out some possible obvious factors that could invalidate it.

The first concern could be due to the fact that some omitted geographical factors or religion affected both the Soviet conflict in 1979-89 and child labour in 2007-2008. In order to check the possible effect of these omitted variables I control, as a robustness check, for the distance of the household from Pakistan. This measure is a good proxy for terrain ruggedness, altitude and religion. The Afghan conflict is concentrated along the Blue Mountains at the border with Pakistan.

The results presented in Table 2.27 show that the main results still hold.The significance of the results is now lower plausibly because distance from Pakistan is

strongly correlated with the measure of conflict used.

A second concern, could be that conflict thirty years before could affect child labour today through the level of parent's education. This second concern is addressed controlling in the regressions for the level of education of both mother and father.

Finally, it could be argued that conflict during the Soviet war might had an impact on the geographical distribution of child-labour-intensive economic sectors in Afghan districts today. However, the independence of past conflict from the distribution of economic activities in 2007-08 it has already been defended in Chapter 1. In particular, in particular, the surge of illecit opium activities and cross-border trade with the arise of the Talibans and the cease of the production of natural gas after the Russian occupation (see the discussion in Section 1.1.2) provide clear examples of conflict intensity during the Soviet period should not be correlated with the distribution of the economic sectors in 2007-2008 if not through observable fixed factors that are controlled for in the estimation strategy.

2.4 Results

2.4.1 Main results

The impact of conflict on the extensive margin of child labour supply

The impact of higher conflict intensity [12] in Afghan districts on children (6-15 years old) participation in the labour force (the extensive margin of child labour supply) is analysed using both a Linear Probability Model and an instrumental variable strategy. The description of the covariates I use in the regressions is available in Table 2.1, the results are available in Table 2.8 - 2.11. The first stages reported in panel A of Table 2.8 - 2.11 show, as in chapter one, that there is a positive significant relationship between the Russian conflict (1979-1989) and conflict in Afghanistan in 2007-2008 at a district level, which is significant at a 5% level of confidence. The F-test is greater than 10, which suggests that the instrument is valid along this dimension.

Table 2.8 column (1)-(9) shows the results of the linear probility model estimates on the total sample of children and testing for heterogenous conflict effects on child gender. The total sample between males and females testing for heterogeneus effects across gender in Table 2.8 column (4)-(9). The IV coefficients in columns 3, 6 and 9 show that one more conflict over a thousand inhabitants, increases the probability of a female child working of about 7% points, significant at a 10% level. The IV coefficients here are all significantly different (higher) than the OLS ones, suggesting that the latter are downward biased.

Table 2.10 shows the LPM estimates for a sample of male children split also by class age. Here the IV estimates in column (3) and (6) show that the impact of conflict on the extensive margin of the male children labour supply is never significant.

Table 2.11 shows instead the LPM estimates for a sample of female children split also by class age. The results shown in column (3) show that the increase in child labour is significantly driven by an increase in the probability of younger females (between 6 and 12) working, as their probability of entering the labour

[12] normalised by population

force is of about 8 % points significantly higher when they live in a district with higher conflict intensity. Even here, the IV estimates suggest that LPM results are downward biased.

Table 2.12 shows the impact of conflict events with either wounded or killed victims on the extensive margin of child labour supply. The magnitude of the impact of conflict on the probability of a female child going to work increases more (about 11.6% points) when compared to Table 2.8 (about 7% points). This suggest that where the conflict either injures or kills members of the household children increase their labour supply at a higher rate. The coefficient of the estimates are significant at the 10% level.

Concluding, the results seem to suggest that only younger female children increase their labour force participation in Afghan districts under higher conflict. These results seem to be consistent with the economic literature that suggests that under conflict, given higher uncertainty of the returns to capital, households prefer to invest in boys' education rather than in females'.

Table 2.8: **Linear probility model estimates of the effect of conflict intensity per district on child labour. Conflict intensity is the number of conflicts normalised by population per district (NRVA data)**

PANEL A (first stage)									
VARIABLES			N_conflict			N_conflict			N_conflict
IV			.064***			.062***			.065***
			(0.016)			(0.014)			(0.018)
F-test			15.90			19.86			12.46
PANEL B									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	(OLS)	(OLS)	(IV)	(OLS)	(OLS)	(IV)	(OLS)	(OLS)	(IV)
VARIABLES	Cwork	Cwork	Cwork	MCwork	MCwork	MCwork	FCwork	FCwork	FCwork
N_conflict	0.00504	-0.0237**	0.0384	0.00355	-0.0326***	0.00915	0.00554	-0.0147	0.0693**
	(0.00960)	(0.00976)	(0.0326)	(0.00968)	(0.00897)	(0.0347)	(0.0103)	(0.0115)	(0.0346)
HH controls	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
District level controls	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Observations	45,050	45,050	45,050	23,282	23,282	23,282	21,768	21,768	21,768
R^2	0.000	0.144	0.123	0.000	0.168	0.160	0.000	0.100	0.051

Notes: Cluster robust standard errors in parentheses, the cluster is the district.
*** p<0.01, ** p<0.05, * p<0.1
The dependent variables are variables defined at the child level. Conflict measures instead are defined at the district level. All the conflict measures are normalised by population (a unit of conflict is 1/1000 inhabitants). Estimated with the variables described in Table 2.1

Table 2.9: **Linear probility model estimates of the effect of conflict intensity per district on child labour per class age.**

PANEL A (first stage)		
	(1)	(2)
VARIABLES	N_conflict	N_conflict
IV	.063***	.067***
	(0.016)	(0.016)
F-test	15.53	15.94

PANEL B						
	(1)	(2)	(3)	(4)	(5)	(6)
	(OLS)	(OLS)	(IV)	(OLS)	(OLS)	(IV)
VARIABLES	Cwork6_12	Cwork6_12	Cwork6_12	Cwork13_15	Cwork13_15	Cwork13_15
N_conflict	0.00385	-0.0245**	0.0420	0.0218	-0.0201*	0.0291
	(0.00872)	(0.00987)	(0.0307)	(0.0151)	(0.0120)	(0.0489)
HH controls	Yes	Yes	Yes	Yes	Yes	Yes
District level controls	No	Yes	Yes	No	Yes	Yes
Observations	33,701	33,701	33,701	11,349	11,349	11,349
R^2	0.000	0.112	0.079	0.002	0.122	0.115

Notes: Cluster robust standard errors in parentheses, the cluster is the district.
*** p<0.01, ** p<0.05, * p<0.1
The dependent variables are variables defined at the child level. Conflict measures instead are defined at the district level. All the conflict measures are normalised by population (a unit of conflict is 1/1000 inhabitants). Estimated with the variables described in Table 2.1

Table 2.10: **Linear probility model estimates of the effect of conflict intensity per district on child labour per class age (females).**

PANEL A (first stage)		
	(1)	(2)
VARIABLES	N_conflict	N_conflict
IV	.061***	.068***
	(0.014)	(0.017)
F-test	19.32	16.03

PANEL B						
	(1)	(2)	(3)	(4)	(5)	(6)
	(OLS)	(OLS)	(IV)	(OLS)	(OLS)	(IV)
VARIABLES	FCwork6_12	FCwork6_12	FCwork6_12	FCwork13_15	FCwork13_15	FCwork13_15
N_conflict	0.00615	-0.0152	0.0804**	0.0156	-0.0124	0.0300
	(0.00911)	(0.0111)	(0.0359)	(0.0183)	(0.0161)	(0.0502)
HH controls	No	Yes	Yes	No	Yes	Yes
District level controls	No	Yes	Yes	No	Yes	Yes
Observations	16,241	16,241	16,241	5,527	5,527	5,527
R^2	0.000	0.082	-0.005	0.001	0.078	0.071

Notes: Cluster robust standard errors in parentheses, the cluster is the district.
*** p<0.01, ** p<0.05, * p<0.1
The dependent variables are variables defined at the child level. Conflict measures instead are defined at the district level. All the conflict measures are normalised by population (a unit of conflict is 1/1000 inhabitants). Estimated with the variables described in Table 2.1

Table 2.11: **Linear probility model estimates of the effect of conflict intensity per district on child labour per class age (males).**

PANEL A (first stage)		
	(1)	(2)
VARIABLES	N_conflict	N_conflict
IV	.064***	.066***
	(0.019)	(0.017)
F-test	11.66	15.11

PANEL B						
	(1)	(2)	(3)	(4)	(5)	(6)
	(OLS)	(OLS)	(IV)	(OLS)	(OLS)	(IV)
VARIABLES	MCwork6_12	MCwork6_12	MCwork6_12	MCwork13_15	MCwork13_15	MCwork13_15
N_conflict	0.00149	-0.0334***	0.00516	0.0210	-0.0292**	0.0219
	(0.00893)	(0.00945)	(0.0321)	(0.0149)	(0.0118)	(0.0603)
HH controls	No	Yes	Yes	No	Yes	Yes
District level controls	No	Yes	Yes	No	Yes	Yes
Observations	17,460	17,460	17,460	5,822	5,822	5,822
R^2	0.000	0.129	0.120	0.002	0.119	0.112

Notes: Cluster robust standard errors in parentheses, the cluster is the district.
*** p<0.01, ** p<0.05, * p<0.1
The dependent variables are variables defined at the child level. Conflict measures instead are defined at the district level. All the conflict measures are normalised by population (a unit of conflict is 1/1000 inhabitants). Estimated with the variables described in Table 2.1

Table 2.12: **Linear probility model estimates of the effect of conflict intensity per district on child labour. Conflict intensity is the number of conflicts normalised by population per district (NRVA data) - only violent conflict events (with wounded/killed)**

PANEL A (first stage)									
VARIABLES			N_conflict			N_conflict			N_conflict
IV			.038***			.038***			.038***
			(0.000)			(0.000)			(0.000)
F-test			60.69			66.90			54.13
PANEL B									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	(OLS)	(OLS)	(IV)	(OLS)	(OLS)	(IV)	(OLS)	(OLS)	(IV)
VARIABLES	Cwork	Cwork	Cwork	MCwork	MCwork	MCwork	FCwork	FCwork	FCwork
N. of wounded and killed	0.0502	-0.112**	0.0655	0.0550	-0.146***	0.0159	0.0398	-0.0791	0.116*
	(0.0464)	(0.0518)	(0.0570)	(0.0474)	(0.0478)	(0.0607)	(0.0509)	(0.0620)	(0.0607)
HH controls	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
District level controls	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Observations	45,050	45,050	45,050	23,282	23,282	23,282	21,768	21,768	21,768
R^2	0.001	0.144	0.137	0.001	0.167	0.162	0.001	0.100	0.089

Notes: Cluster robust standard errors in parentheses, the cluster is the district.
*** p<0.01, ** p<0.05, * p<0.1
The dependent variables are variables defined at the child level. Conflict measures instead are defined at the district level. All the conflict measures are normalised by population (a unit of conflict is 1/1000 inhabitants). Estimated with the variables described in Table 2.1

2.4.2 Heterogeneous effects

It could be the case that the impact of conflict on child labour is heterogeneous across households with different characteristics.

Table 2.13 and 2.14 show the IV estimates of the impact of conflict on the extensive margin of child labour supply distinguishing between households with a low educated household head (primary and secondary education) and households with a highly educated household head (tertiary school or higher degrees).

Table 2.13 shows that the girl's extensive labour supply response is heterogeneous with respect to the level of education of the household head. Column 1 shows that girls who live in households with a lower educated household head have an higher probabiliy of going to work of about 7 percentange points as a response to unitary increase in the conflict measure.

The impact of conflict on the boys' probability of going to work instead, does not seem to be heterogeneus with respect to the level of education of the household head (see Table 2.14).

These results suggest that conflict enhances already existent intra-household differences in the accumulation of human capital. The policy implication of these findings is the necessity to improveme the access to education as its negative consequences could be transmitted through generations.

Table 2.13: **Heterogeneus effects of the IV estimates of the effect of conflict intensity per district on child labour by the level of education of the household head (girls)**

	(1)	(2)	(3)	(4)
	Low	Low	High	High
VARIABLES	6_12	13_15	6_12	13_15
N_conflict	0.0653**	0.0140	3.291	0.0999
	(0.0289)	(0.0450)	(42.62)	(0.986)
Constant	0.302	0.242	-0.496	-0.0714
	(0.210)	(0.395)	(14.55)	(1.213)
Observations	13,967	4,663	1,951	744
R^2	0.030	0.068	-154.915	0.017

Notes: Cluster robust standard errors in parentheses, the cluster is the district.
*** p<0.01, ** p<0.05, * p<0.1
The dependent variables are variables defined at the child level. Conflict measures instead are defined at the district level. All the conflict measures are normalised by population (a unit of conflict is 1/1000 inhabitants). Estimated with the variables described in Table 2.1

Table 2.14: **Heterogeneus effects of the IV estimates of the effect of conflict intensity per district on child labour by the level of education of the household head (boys)**

	(1)	(2)	(3)	(4)
	Low	Low	High	High
VARIABLES	6_12	13_15	6_12	13_15
N_conflict	-0.00861	0.0151	-0.0272	0.186
	(0.0309)	(0.0554)	(0.175)	(1.086)
Constant	0.372*	0.455	0.543*	0.122
	(0.216)	(0.395)	(0.317)	(0.933)
Observations	15,168	4,941	1,968	730
R^2	0.129	0.084	0.072	-0.021

Notes: Cluster robust standard errors in parentheses, the cluster is the district.
*** p<0.01, ** p<0.05, * p<0.1
The dependent variables are variables defined at the child level. Conflict measures instead are defined at the district level. All the conflict measures are normalised by population (a unit of conflict is 1/1000 inhabitants). Estimated with the variables described in Table 2.1

The impact of conflict on the intensive margin of child labour supply

This paper also studies the impact of higher conflict intensity in Afghan districts on the number of both domestic and non-domestic hours worked by children - the intensive margin of child labour supply.

Table 2.15 shows that the OLS and IV estimates of higher conflict intensity per district on non-domestic children hours worked conditional on more than zero hours worked. These estimates measure the intensive margin of the children labour supply response to higher conflict intensity. The IV regressions show that females work significantly fewer non-domestic hours a day in the past week. When our measure of conflict increases by one unit non-domestic hours fall by 0.48 hours, on average. When decomposing these effects by class ages and gender in tables 2.16 -2.19 the IV results show that the decrease in non-domestic hours worked is significant just for younger females (-0.5) see Table 2.19 column (3). I do not find any significant effect of conflict on domestic hours worked. Table 2.18 shows the results for males. The instrument does not seem to be powerful for this subsample as there is not enough variation in the number of domestic hours worked by the boys when comparing high and low intensity areas (see Table 2.6. Thus, no conclusions on the impact of conflict

on boys' domestic hours worked can be driven from the analysis that splits the boys' sample according to the class age.

A tobit model is also estimated lower-bound censored at zero hours worked. These estimates capture both the extensive and the intensive margin of the children labour supply response to higher conflict intensity. Table 2.28 column (1)-(3) in the Appendix shows the tobit marginal effects of children both domestic and non-domestic hours worked for the total sample. The results of the IV tobit regressions show that the effect is not significant.

Table 2.15: **OLS and IV estimates of conflict intensity per district on children non-domestic hours worked per gender conditional on more than zero hours worked**

PANEL A (first stage)									
VARIABLES			N_conflict			N_conflict			N_conflict
IV			.074***			.073***			.074***
			(0.011)			(0.009)			(0.017)
F-test			40.56			17.92			60.98
PANEL B									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
VARIABLES	(OLS) whours	(OLS) whours	(IV) whours	(OLS) whoursM	(OLS) whoursM	(IV) whoursM	(OLS) whoursF	(OLS) whoursF	(IV) whoursF
N_conflict	-0.202*	-0.323***	-0.446*	-0.242***	-0.288***	-0.326	-0.105	-0.335***	-0.481**
	(0.111)	(0.0833)	(0.243)	(0.0897)	(0.0897)	(0.375)	(0.198)	(0.0897)	(0.232)
HH controls	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
District level controls	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Observations	7,794	7,794	7,794	5,031	5,031	5,031	2,763	2,763	2,763
R^2	0.006	0.111	0.109	0.009	0.113	0.112	0.001	0.160	0.158

Notes: Cluster robust standard errors in parentheses, the cluster is the district.
*** p<0.01, ** p<0.05, * p<0.1
The dependent variables are variables defined at the child level. Conflict measures instead are defined at the district level. All the conflict measures are normalised by population (a unit of conflict is 1/1000 inhabitants). Estimated with the variables described in Table 2.1

Table 2.16: **OLS and IV estimates of conflict intensity per district on children domestic hours worked per gender conditional on more than zero hours worked**

PANEL A (first stage)									
VARIABLES			N_conflict			N_conflict			N_conflict
IV			.066***			.055***			.068***
			(0.000)			(0.001)			(0.000)
F-test			80.28			11.97			86.67
PANEL B									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
VARIABLES	(OLS) dcwhours	(OLS) dcwhours	(IV) dcwhours	(OLS) dcwhoursM	(OLS) dcwhoursM	(IV) dcwhoursM	(OLS) dcwhoursF	(OLS) dcwhoursF	(IV) dcwhoursF
N_conflict	-0.138**	-0.0577	-0.300	-0.141***	-0.0350	-0.877	-0.122	-0.0724	-0.0925
	(0.0543)	(0.0526)	(0.259)	(0.0459)	(0.0464)	(1.105)	(0.0856)	(0.0834)	(0.120)
HH controls	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
District level controls	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Observations	5,630	5,630	5,630	3,251	3,251	3,251	2,379	2,379	2,379
R^2	0.007	0.051	0.035	0.008	0.066	-0.157	0.004	0.038	0.038

Notes: Cluster robust standard errors in parentheses, the cluster is the district.
*** p<0.01, ** p<0.05, * p<0.1
The dependent variables are variables defined at the child level. Conflict measures instead are defined at the district level. All the conflict measures are normalised by population (a unit of conflict is 1/1000 inhabitants). Estimated with the variables described in Table 2.1

Table 2.17: **OLS and IV estimates of conflict intensity per district on children non-domestic hours worked per class-age conditional on more than zero hours worked (males)**

PANEL A (first stage)		
	(1)	(2)
VARIABLES	N_conflict	N_conflict
IV	.076***	.070***
	(0.019)	(0.017)
F-test	16.22	17.63

PANEL B						
	(1)	(2)	(3)	(4)	(5)	(6)
	(OLS)	(OLS)	(IV)	(OLS)	(OLS)	(IV)
VARIABLES	whours6_12	whours6_12	whours6_12	whours13_15	whours13_15	whours13_15
N_conflict	-0.0804	-0.238**	-0.392	-0.395***	-0.288***	-0.319
	(0.131)	(0.0989)	(0.481)	(0.0830)	(0.0826)	(0.312)
HH controls	No	Yes	Yes	No	Yes	Yes
District level controls	No	Yes	Yes	No	Yes	Yes
Observations	2,758	2,758	2,758	2,273	2,273	2,273
R^2	0.001	0.095	0.092	0.027	0.145	0.145

Notes: Cluster robust standard errors in parentheses, the cluster is the district.
*** p<0.01, ** p<0.05, * p<0.1
The dependent variables are variables defined at the child level. Conflict measures instead are defined at the district level. All the conflict measures are normalised by population (a unit of conflict is 1/1000 inhabitants). Estimated with the variables described in Table 2.1

Table 2.18: **OLS and IV estimates of conflict intensity per district on children domestic hours worked per class-age conditional on more than zero hours worked (males)**

PANEL A (first stage)		
	(1)	(2)
VARIABLES	N_conflict	N_conflict
IV	.047**	.058***
	(0.07)	(0.003)
F-test	2.59	8.64

PANEL B						
	(1)	(2)	(3)	(4)	(5)	(6)
	(OLS)	(OLS)	(IV)	(OLS)	(OLS)	(IV)
VARIABLES	dcwhours6_12	dcwhours6_12	dcwhours6_12	dcwhours13_15	dcwhours13_15	dcwhours13_15
N_conflict	-0.119**	-0.0250	-1.349	-0.162***	-0.0339	-0.748
	(0.0518)	(0.0622)	(3.671)	(0.0517)	(0.0411)	(0.559)
HH controls	No	Yes	Yes	No	Yes	Yes
District level controls	No	Yes	Yes	No	Yes	Yes
Observations	1,784	1,784	1,784	1,467	1,467	1,467
R^2	0.006	0.053	-0.476	0.012	0.097	-0.066

Notes: Cluster robust standard errors in parentheses, the cluster is the district.
*** p<0.01, ** p<0.05, * p<0.1
The dependent variables are variables defined at the child level. Conflict measures instead are defined at the district level. All the conflict measures are normalised by population (a unit of conflict is 1/1000 inhabitants). Estimated with the variables described in Table 2.1

Table 2.19: **OLS and IV estimates of conflict intensity per district on children non-domestic hours worked per class-age conditional on more than zero hours worked (females)**

PANEL A (first stage)		
	(1)	(2)
VARIABLES	N_conflict	N_conflict
IV	.069***	.073***
	(0.000)	(0.017)
F-test	76.33	27.44

PANEL B						
	(1)	(2)	(3)	(4)	(5)	(6)
	(OLS)	(OLS)	(IV)	(OLS)	(OLS)	(IV)
VARIABLES	whours6_12	whours6_12	whours6_12	whours13_15	whours13_15	whours13_15
N_conflict	-0.0199	-0.237***	-0.500***	-0.233	-0.492***	-0.250
	(0.227)	(0.0835)	(0.152)	(0.174)	(0.123)	(0.534)
HH controls	No	Yes	Yes	No	Yes	Yes
District level controls	No	Yes	Yes	No	Yes	Yes
Observations	1,532	1,532	1,532	1,231	1,231	1,231
R^2	0.000	0.186	0.177	0.006	0.157	0.152

Notes: Cluster robust standard errors in parentheses, the cluster is the district.
*** p<0.01, ** p<0.05, * p<0.1
The dependent variables are variables defined at the child level. Conflict measures instead are defined at the district level. All the conflict measures are normalised by population (a unit of conflict is 1/1000 inhabitants). Estimated with the variables described in Table 2.1

Table 2.20: **OLS and IV estimates of conflict intensity per district on children domestic hours worked per class-age conditional on more than zero hours worked (females)**

PANEL A (first stage)		
	(1)	(2)
VARIABLES	N_conflict	N_conflict
IV	.069***	.071***
	(0.000)	(0.000)
F-test	61.93	23.42

PANEL B						
	(1)	(2)	(3)	(4)	(5)	(6)
	(OLS)	(OLS)	(IV)	(OLS)	(OLS)	(IV)
VARIABLES	dcwhours6_12	dcwhours6_12	dcwhours6_12	dcwhours13_15	dcwhours13_15	dcwhours13_15
N_conflict	-0.120	-0.0334	-0.0816	-0.108	-0.150	-0.0156
	(0.0892)	(0.0979)	(0.118)	(0.113)	(0.0991)	(0.232)
HH controls	No	Yes	Yes	No	Yes	Yes
District level controls	No	Yes	Yes	No	Yes	Yes
Observations	1,297	1,297	1,297	1,082	1,082	1,082
R^2	0.004	0.043	0.043	0.003	0.069	0.066

Notes: Cluster robust standard errors in parentheses, the cluster is the district.
*** p<0.01, ** p<0.05, * p<0.1
The dependent variables are variables defined at the child level. Conflict measures instead are defined at the district level. All the conflict measures are normalised by population (a unit of conflict is 1/1000 inhabitants). Estimated with the variables described in Table 2.1

2.4.3 Mechanisms

Tables 2.21 - 2.24 show evidence of the possible mechanisms that could explain the increase in child labour supply due to conflict.

First, Table 2.21 suggests that households may use child labour to insure against the decrease in consumption due to conflict. The IV estimates in column 1 show that households with children in high conflict areas do not show any significant relative drop in food consumption. In contrast, households without children, experience a decrease in food consumption in the high conflict areas of about 2.6 Kilos per unit conflict incidence (about 4.6 percentage points fall with respect to the average weekly consumption in thelast 7 days) which is significant at the 10% significance level[13] .

Second, conflict could increase child labour re-allocating the labour supply within the household. It could be the case that in conflict-ridden districts male adults were involved in war-related activities and that because of cultural constraints children rather than women were asked to replace them on the labour market. Table 2.22 suggests that conflict increases also adult's labour supply in te hosehold. Both the share of male adults and the share of female households working increases when our measure of conflict intensity goes up by one unit. The results show that during war the share of females working increases more (of about 13%) with respect to the share of males working which increases of about 3.9%. These findings are consistent with the literature that suggests that parents are *altruistic* and send chidren to work just for *necessity*. Households under conflict become poorer and all the household members work more for the household survival. Manacorda [2006], finds that a rise in the proportion of working children by household is associated with no variation in parent's labour supply and that parents redistribute entirely the returns from child labour to the children in the household. Basu and Van [1998], suggest that child labour as a mass phenomenon occurs not because of parental selfishness but because of the parents' concern for the household's survival.

Third, the increase in child labour could be due to an increase in child labour-intensive economic sectors. Table 2.23 suggests that the probability of a girl working

[13]Note conflict estimates are not significantly different from each other.

Table 2.21: **IV estimates of conflict intensity per district on consumption (in Kg.)**

VARIABLES	(1) (IV) food consumption Households with children	(2) (IV) food consumption Households without children
N_conflict	-2.332	-2.764*
	(1.766)	(1.626)
Constant	-62.36***	36.96**
	(13.40)	(15.37)
HH controls	Yes	Yes
District level controls	Yes	Yes
Observations	15,073	3,727
R^2	0.276	0.341

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
All the conflict measures are normalised by population (a unit of conflict is 1/1000 inhabitants)

in the household dwellings increases of about 2.6% points significant at the 10% level as a response to a unitary increase in the measure of conflict. The results show no significant changes of the probability of working in other economic sectors (agriculture, hazardous type of work such as constructions and quarrying, shop-keeping and other). This seems to rule out the hypothesis of the increase in child-labour economic sectors during war.

Finally, it could be that in times of war children do not attend school either because of security reasons or because they have to work in order to guarantee the household's survival. Table 2.24 shows that I cannot find any significant impact of conflict on schooling. The reason could be that, having Afghanistan been in war since 2001, the analysis done for 2007/08 cannot capture the changes in school enrolment.

Overall, the findings suggest that the *necessity* hypothesis is the driver of the increase in children labour supply and that female children are those most affected by the increase in conflict intensity. However, the childen entering the labour supply because of conflict work more in a protected environment, the household dweelings, while no significant effect is found on hazardous type of work (construction and quarrying).

Table 2.22: **IV estimates of conflict on the share of adults working in the household**

VARIABLES	(1) (IV) Males	(2) (IV) Females
N_conflict	0.0393***	0.137***
	(0.0132)	(0.0406)
Constant	1.002***	0.866***
	(0.122)	(0.326)
HH controls	Yes	Yes
District level controls	Yes	Yes
Observations	15,073	15,073
R^2	0.168	0.081

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
All the conflict measures are normalised by population (a unit of conflict is 1/1000 inhabitants)

Table 2.23: **IV estimates of conflict child labour by type of work**

VARIABLES	(1) (IV) HH dwellings	(2) (IV) agriculture	(3) (IV) hazardous	(4) (IV) shop	(5) (IV) other
N_conflict	0.0263*	0.00399	-8.44e-05	-0.000361	-0.00136
	(0.0141)	(0.0126)	(9.97e-05)	(0.000265)	(0.00159)
Constant	0.294***	-0.0980**	0.000949	0.000693	0.0357***
	(0.102)	(0.0441)	(0.000668)	(0.00297)	(0.0117)
HH controls	Yes	Yes	Yes	Yes	Yes
District level controls	Yes	Yes	Yes	Yes	Yes
Observations	44,132	44,132	44,132	44,132	44,132
R^2	0.074	0.027	0.001	0.001	0.006

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
All the conflict measures are normalised by population (a unit of conflict is 1/1000 inhabitants)

Table 2.24: **Impact of conflict on schooling**

VARIABLES	(1) school 6_12	(2) school 13_15	(3) school Boys 6_12	(4) school Boys 13_15	(5) school Girls 6_12	(6) school Girls 13_15
N_conflict	0.00635	0.0236	0.00414	0.0240	0.00864	0.0154
	(0.00685)	(0.0181)	(0.0112)	(0.0208)	(0.00669)	(0.0214)
Constant	0.997***	0.979***	0.988***	1.004***	1.010***	0.956***
	(0.0372)	(0.123)	(0.0504)	(0.168)	(0.0434)	(0.153)
HH controls	Yes	Yes	Yes	Yes	Yes	Yes
District level controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	33,054	11,078	17,136	5,671	15,918	5,407
R^2	0.938	0.796	0.935	0.790	0.937	0.779

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
All the conflict measures are normalised by population (a unit of conflict is 1/1000 inhabitants)

2.4.4 Robustness checks

In this section I report some robustness checks which include both an alternative definition of conflict and additional control variables. Specifically it is of interest to test different definitions of conflict to see if any conflict event increases child labour, or if only conflict events which cause casualties have an important influence.

Table 2.25 shows the impact of conflict on the extensive margin of child labour supply using more control variables such as the availability of infrustructure (roads and markets) in the district. These variables are arguably endogenous as they are potentially correlated with household wealth, an omitted variable that could have an impact on child labour. Both the magnitude and the significance of the results do not change when compared with those in Table 2.8, suggesting that the results are fairly stable across different regression specifications.

Table 2.26 shows the impact of conflict on the extensive margin of child labour supply excluding the Kabul district where conflict intensity is above the average. Even here both the magnitude and the significance of the results do not change when compared with those in Table 2.8, suggesting that the results are not driven by the higher conflict intensity in the district of the capital of Afghanistan.

Other robustness checks, not reported in the paper for brevity, were run using both a quadratic and an hyperbolic measure of conflict. The results are not significant, suggesting that these model do not fit the relationship between conflict and child labour.

Table 2.25: **Linear probility model estimates of the effect of conflict intensity per district on child labour. Conflict intensity is the number of conflicts normalised by population per district (NRVA data) - more district controls (distance from the road and from the market)**

PANEL A (first stage)			
VARIABLES	N_conflict	N_conflict	N_conflict
IV	.064***	.062***	.065***
	(0.016)	(0.014)	(0.018)
F-test	15.90	19.86	12.46

PANEL B									
VARIABLES	(1) (OLS) Cwork	(2) (OLS) Cwork	(3) (IV) Cwork	(4) (OLS) MCwork	(5) (OLS) MCwork	(6) (IV) MCwork	(7) (OLS) FCwork	(8) (OLS) FCwork	(9) (IV) FCwork
N_conflict	0.00504	-0.0231**	0.0432	0.00355	-0.0319***	0.0127	0.00554	-0.0143	0.0750**
	(0.00960)	(0.00956)	(0.0322)	(0.00968)	(0.00887)	(0.0340)	(0.0103)	(0.0112)	(0.0347)
HH controls	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
District level controls	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Observations	45,050	45,050	45,050	23,282	23,282	23,282	21,768	21,768	21,768
R^2	0.000	0.146	0.122	0.000	0.170	0.160	0.000	0.101	0.047

Notes: Cluster robust standard errors in parentheses, the cluster is the district.
*** p<0.01, ** p<0.05, * p<0.1
The dependent variables are variables defined at the child level. Conflict measures instead are defined at the district level. All the conflict measures are normalised by population (a unit of conflict is 1/1000 inhabitants). Estimated with the variables described in Table 2.1

Table 2.26: **Linear probility model estimates of the effect of conflict intensity per district on child labour. Conflict intensity is the number of conflicts normalised by population per district (NRVA data) - Kabul district excluded**

PANEL A (first stage)									
VARIABLES			N_conflict			N_conflict			N_conflict
IV			.066***			.067***			.065***
			(0.016)			(0.014)			(0.018)
F-test			16.97			13.14			21.61
PANEL B									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	(OLS)	(OLS)	(IV)	(OLS)	(OLS)	(IV)	(OLS)	(OLS)	(IV)
VARIABLES	Cwork	Cwork	Cwork	MCwork	MCwork	MCwork	FCwork	FCwork	FCwork
N_conflict	0.00246	-0.0218**	0.0437	0.000535	-0.0294***	0.0205	0.00342	-0.0137	0.0683**
	(0.00908)	(0.00980)	(0.0320)	(0.00905)	(0.00901)	(0.0349)	(0.00996)	(0.0115)	(0.0329)
HH controls	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
District level controls	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Observations	42,242	42,242	42,242	21,846	21,846	21,846	20,396	20,396	20,396
R^2	0.000	0.140	0.115	0.000	0.162	0.149	0.000	0.096	0.048

Notes: Cluster robust standard errors in parentheses, the cluster is the district.
*** p<0.01, ** p<0.05, * p<0.1
The dependent variables are variables defined at the child level. Conflict measures instead are defined at the district level. All the conflict measures are normalised by population (a unit of conflict is 1/1000 inhabitants). Estimated with the variables described in Table 2.1

Table 2.27: **Linear probility model estimates of the effect of conflict intensity per district on child labour. Conflict intensity is the number of conflicts normalised by population per district (NRVA data) - Distance from Pakistan included**

VARIABLES	(1) works 6_12	(2) works 13_15	(3) works Boys 6_12	(4) works Boys 13_15	(5) works Girls 6_12	(6) works Girls 13_15
N_conflict	0.0464	0.0621	0.0129	0.0841	0.0805*	0.0284
	(0.0378)	(0.0610)	(0.0390)	(0.0884)	(0.0422)	(0.0537)
Constant	0.331*	0.321	0.429**	0.558	0.302	0.315
	(0.190)	(0.310)	(0.207)	(0.361)	(0.212)	(0.372)
HH controls	Yes	Yes	Yes	Yes	Yes	Yes
District level controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	33,054	11,078	17,136	5,671	15,918	5,407
R^2	0.082	0.113	0.123	0.100	0.004	0.079

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

All the conflict measures are normalised by population (a unit of conflict is 1/1000 inhabitants)

2.5 Concluding remarks

This paper is the first study that analyses how higher conflict intensity in a district affects both the extensive margin (participation to the labour force) and the intensive margin (number of hours worked) of child labour supply in Afghanistan.

The results suggest that children in conflict affected areas, especially young females, are more likely to join the labour force but work fewer non-domestic hours per week. In particular, the results show that a one unit increase in conflict intensity[14] has a positive impact on the extensive margin of child labour labour supply and that this increase is entirely driven by 6-12 years old female children (8% points). I also find an increase in adult labour supply which seems to be driven by female adults (8.3% points). The results of the analysis of the impact of higher conflict intensity in Afghan districts on the intensive margin response of children labour supply suggest that there is a decrease in non-domestic hours worked which is significant just for younger (6-12 years old) females (-0.5). I do not find any significant effect on domestic hours worked. The negative results on the intensive margin can be reconciled with the positive ones on the extensive margin looking at the distribution of the numbers of hours worked. The distribution suggests that children entering the labour supply work a lower number of hours, justifying the negative sign on the change of the intensive margin, see Fig. 2.3.

Finally I explored the possible mechanisms that could increase the extensive margin of child labour supply under conflict. Overall, the findings suggest that the *necessity* hypothesis is the driver of the increase in children labour supply and that female children are those most affected by the increase in conflict intensity. However, the childen entering the labour supply because of conflict work more in a protected environment, the household dwellings, while no significant effect is found on hazardous type of work (construction and quarrying).

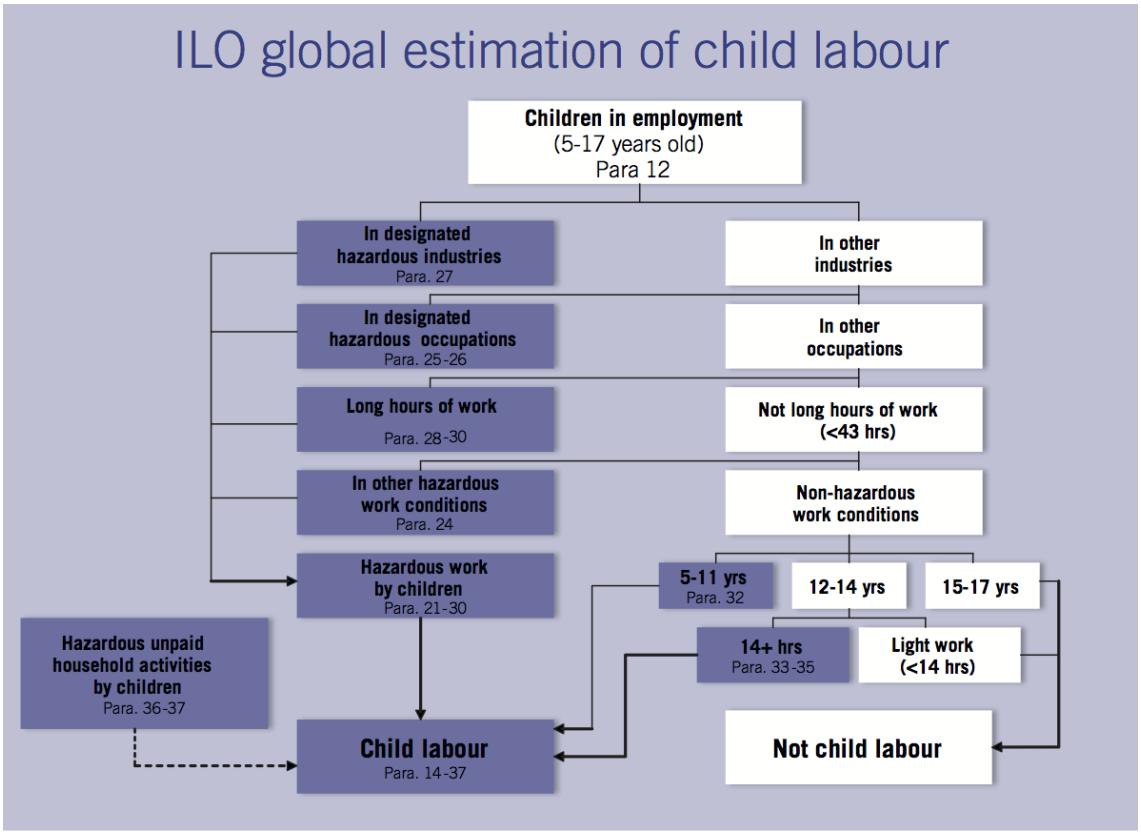
The results of this analysis shed a light on the impact of conflict on child labour suggesting that policy-makers have to keep in to account that sending children to work can be driven by households' necessity of survival. Regulating the working conditions of children prohibiting hazardous work in times of war, following the

[14] One conflict over 1000 individuals in the district.

example of both Afghanistan (in 2013) and Bolivia (in 2014) seems to be the priority when adopting new child labour regulations in fragile and conflict-ridden states.

2.6 Appendix

Figure 2.12: **Definition of child labour according to the 18th International Conference of Labour Statisticians (ICLS). Resolution concerning statistics of child labour (ILO, Geneva, 2008). .**



2.6.1 Secondary Results

Table 2.28: **Tobit marginal effects of conflict intensity per district on children domestic hours worked.**

PANEL A (first stage)									
VARIABLES			(3) N_conflict			(6) N_conflict			(9) N_conflict
IV			.064***			.062***			.067***
			(0.016)			(0.014)			(0.013)
Wald-test			0.05			0.49			.00
PANEL B									
	(1) (tobit)	(2) (tobit)	(3) (ivtobit)	(4) (tobit)	(5) (tobit)	(6) (ivtobit)	(7) (tobit)	(8) (tobit)	(9) (ivtobit)
	dcwhours	dcwhours	dcwhours	dcwhoursF	dcwhoursF	dcwhoursF	dcwhoursM	dcwhoursM	dcwhoursM
N_conflict	0.0157	-0.0547*	0.119	0.0160	-0.0601***	0.0251	0.0133	-0.0473	0.198*
	(0.57)	(-2.43)	(1.37)	(0.66)	(-3.34)	(0.19)	(0.36)	(-1.45)	(2.45)
HHcontrols	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
District level controls	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Observations	45050	45050	45050	23282	23282	23282	21768	21768	21768

Marginal effects; t statistics in parentheses
(d) for discrete change of dummy variable from 0 to 1
*** p<0.01, ** p<0.05, * p<0.1
The dependent variables are variables defined at the child level. Conflict measures instead are defined at the district level. All the conflict measures are normalised by population (a unit of conflict is 1/1000 inhabitants). Estimated with the variables described in Table 2.1

Chapter 3

The Differential Labour Demand Response to the Financial Crisis: Evidence from Firms in Transition Countries

3.1 Introduction

How did the financial crisis affect labour demand in transition economies (TEs)[1]? While the economic literature focused on labour market dynamics in TEs after the fall of communism in 1989 (see Lehmann and Muravyev [2011]; Granick [1987], Svejnar [2002]; Singer [1996]) both the short and the long run impact of the financial crisis on labour demand in the transition region are still unexplored. Twenty years after the beginning of the change from a centrally planned to a market economy, the TEs had to face the turmoil of the financial crisis. This was a new challenge for the labour demand adjustments of these countries which have been already tested by the beginning of the transition. The financial market turmoil in Western Europe, which intensified sharply in September and October 2008, triggered the financial crisis in transition economies. The latter experienced sudden large output declines in the fourth quarter of 2008 (after the collapse of Lehman brothers in the U.S.A)

[1]Transition economies are those changing from being under government control to being market economies. In this chapter the countries in Table 3.2

and in the first quarter of 2009, in comparison to only a few months before when the region seemed to have been booming (as shown in Figure 3.1, see EBRD [2009b]). On average GDP shrank by about 6% and in the same period unemployment rates considerably increased see Figure 3.2. The crisis hit the TEs heterogeneusly both in timing and in intensity. Unemployment rates started to soar in the Baltic states and other economies such as Turkey and Ukraine in mid-2008. In contrast, in central and South-Eastern Europe, unemployment rates started to increase only in mid-2009, and even later in South-Eastern Europe. The hardest-hit transition countries during the financial crisis were in the Baltic region and in South-Eastern Europe (Macedonia, Latvia, Lithuania, Moldova, Montenegro, Romania) (see EBRD [2009b]).

The starting point of the present chapter is that relatively little is known about the short-term firm's input demand response to the type of financial crisis typically seen in the industrialised West. About twenty years after the transition process began, the economies of of central and eastern Europe have evolved often at different speeds and in different directions. The Great Recession of 2008 is an opportunity to look for evidence of differential response to a large global negative shock and, if so, to look for explanations.

Previous studies such as EBRD [2009b] and Carlin and Schaffer [2012] focus either on the impact of the crisis on individual unemployment using household data or on firm's response to specific obstacles in the business environment (such as lack of demand of skilled labour, corruption etc.). Other papers such as Bohachova et al. [2011] and Babetski et al. [2012], provide a short-term analysis of a specific country of the financial crisis on firm's labour demand in transition countries. This paper is the first study that aims at identifying cross-country differences in the labour demand response to the financial crisis in the transition region distinguishing countries part of the European Union from those that are not. The recent financial crisis could have impacted diversely firm's labour demand in these two groups of countries for several reasons. Employees in European countries could be protected by stricter regulations on how to fire workers. At the same time European firms could be eligible to receive EU subsides and then could be less prone to fire workers during an economic downturn. Studying both the short and the medium run impact of the financial crisis

on labour demand is relevant as it may affect the levels of wages and employment in varied ways across different countries with different systems. The financial crisis may affect both directly and indirectly some labour demand determinants, such as the cost of capital or the level of sales, decreasing the firm's demand for labour and increasing the level of unemployment. For example, Babetski et al. [2012] found that in the Czech Republic between 2002-2009 the fall in demand had an impact on the labour demand of firms. Given wage rigidities firm's adjusted reducing in prices, margins, output and costs. The cost reduction, had as a consequence a reduction in both permanent and temporary employment, hours of work and non-labour costs. The authors also found that between 2008-2009 employment elasticities with respect to sales increased, while the employment elasticities with respect to real wages were not significant, probably due to limited variation in wages during the crisis.

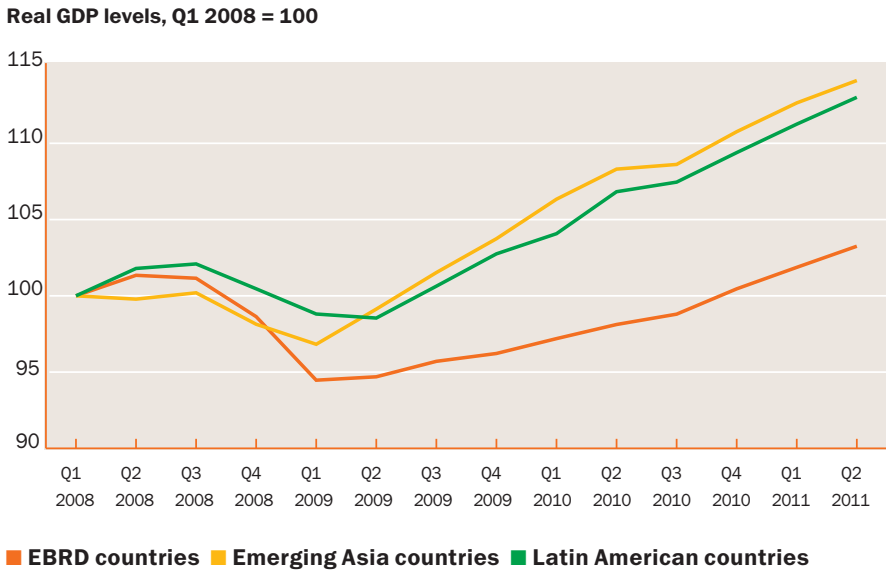


Figure 3.1: **GDP trend in transition countries during and after the financial crisis.**
Source: CEIC Data Company (CEIC) and International Monetary Fund International Financial Statistics (IMF IFS).
Note: GDP levels for each group of countries are simple averages of individual countries' GDP levels. Latin America includes Argentina, Brazil, Chile, Colombia, Mexico and Peru. Emerging Asia includes Hong Kong, India, Indonesia, Korea, Malaysia, Singapore and Thailand. The European Bank for Reconstruction and Development (EBRD) region includes all transition countries[2] except Albania, Bosnia and Herzegovina, FYR Macedonia, Mongolia, Montenegro and Turkmenistan.

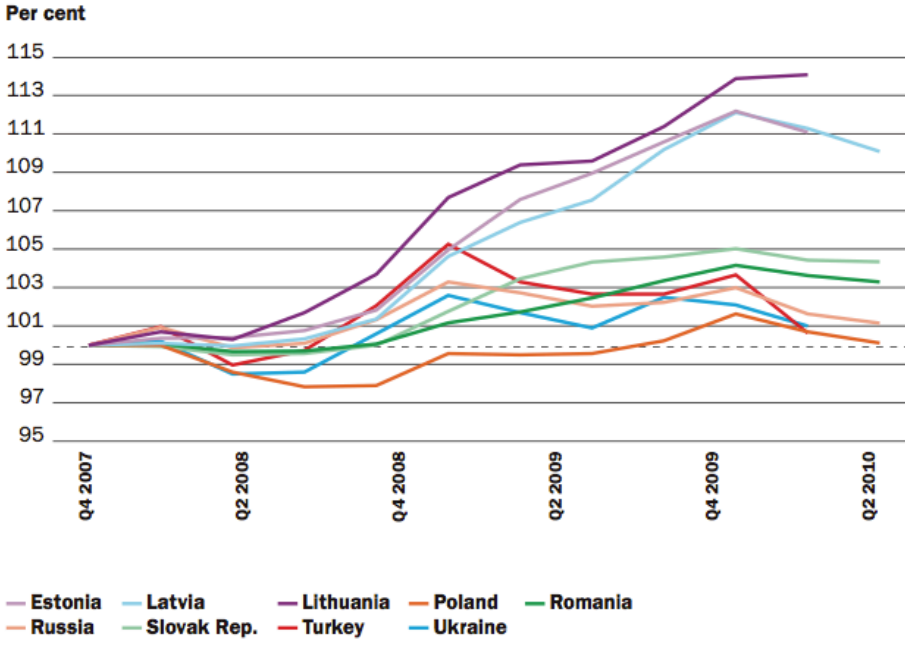


Figure 3.2: **Unemployment rates in transition countries during and after the financial crisis.**
Source: EBRD (2010)
Note: Unemployment rate (Index Q4 2007 = 100)

This chapter studies the causal relationship between the financial crisis and the long-term response of firms' labour demand. Moreover, this chapter aims at identifying the areas in the transition region where labour demand was more affected, distinguishing between European and non-European firms, in order to indirectly measure the impact of European policies on labour. These policies are aimed at mantaining labour demand, improving the employability of the unemployed and the underemployed, providing income support and targeting the most vulnerable. Examples of these policies can be work-sharing; on-the-job-training (both can be subsidized or unsubsidised); job/wage subsidies; public works programmes; job search assistance; work experience and apprenticeship programmes; training; entrepreneurship incentives; unemployment benefits; social assistance; other social protection measures (including conditional cash transfers); hiring subsidies and training schemes (see Cazes et al. [2010]).

The chapter is structured as follows. Section 1 introduces the topic, Section 2 summarizes the relevant literature, Section 3 describes the methodology, Section 4 presents the results. The findings show that the share of temporary workers shrank of about 25% between 2009/10 and 2012/13, while no significant impact of the financial crisis was found on the number of permanent workers. The analysis also shows that when we distinguish European and non-European countries these second ones are those driving the results. Section 5 concludes.

3.2 Literature review

3.2.1 Labour demand dynamics in transition countries

The dynamics of labour demand in transition economies (TEs) have drawn considerable attention in the early years of transition from plan to market of the late 1980s-early 1990s, which involved Central and Eastern Europe as well as of Central Asia. This institutional change had a deep impact on labour markets in those regions.

The labour market dynamics in these regions over the last two decades were summarized by Lehmann and Muravyev [2011] with their emphasis on the role of

labour market institutions. The authors find evidence that there has been considerable liberalisation of labour regulations in TEs that have currently established sets of labour market institutions and policies, which are similar to those existing in mature market economies. The authors also find that labour market deregulation improves their performance if employment protection legislation (EPL) is relatively unregulated since firms will be more willing to hire from the unemployment pool while lowering the tax wedge [3] and shortening benefit duration have a complementary effect on unemployment durations.

Until the late 1980s, most of the TEs, apart from Yugoslavia, were characterised by large excess labour demand (due to an ineffective allocation of labour), no open unemployment, and high labour force participation at the price of extremely low labour productivity and substantial labour hoarding (see Granick [1987]).

The start of the transition saw a rapidly collapsing demand for labour due to labour markets addressing the inefficient use of labour resources during the central planning period. From the start of transition in 1989 until the resumption of economic growth 15 years later, these countries lost between one fifth and two-thirds of their pre-transition level of GDP, EBRD [2009a] . Interestingly, the resumption of economic growth in Central and Eastern Europe (CEE) in the mid-1990s was not always accompanied by increasing employment and falling unemployment (here there are cross country differences). The diverse patterns of labour market adjustment in TEs have caused scholars and policy-makers to look for explanations of these different labour market outcomes such as heterogenous labour market policies and institutions (e.g. labour unions) roles across these countries.

Evidence on how labour market institutions and policies have affected labour market outcomes in Eastern Europe and Central Asia is scarce because of data constraints. Overall, data from TEs suggest that deregulation of labour markets improves their performance (see EBRD [2009a]).

Svejnar [2002] studies the TE economic performance after the fall of communism and shows that in most transition economies, employment decline reached 15 % to 30 % in the 1990s relative to the 1980s. He also observed that when combined with GDP data, employment data suggest that restructuring in the transition economies

[3] The difference between take home pay and the labour cost to the employer

involved an initial decline in labour productivity as output fell faster than employment and a subsequent rise in productivity as output and labour stopped declining. But the author points out that it is also possible, with production shifting from large to small firms, that the decline in employment (and output) is less pronounced than suggested by the official data, since small firms, a typical feature of TEs in the early stages, are harder to capture in official statistics.

Singer [1996] estimated a dynamic labour demand equation derived from a cost-minimization model of monthly data from Czech firms from 1992 to 1993. These estimates are presented with derived long-term wage elasticities. The author finds small, insignificant estimates of short and long-term elasticities, that suggest the possibility of labour hoarding.

A more recent paper by Carlin and Schaffer [2012] using firm level data investigates the interaction between the widespread opportunities for new business activities (after the collapse of planning) in transition countries and their business environment. The business environment includes physical infrastructure, the availability of an educated labour force, provision of administrative and judicial services, the control of corruption and crime, and the stability of the macroeconomic environment. They compare how different elements of the business environment affected firms in formerly planned economies with those in economies outside transition, documenting not only the challenges faced by transition firms but also the effects of the planning legacy. Their model predicts that higher quality firms report higher shadow costs of constraints.

3.2.2 The Impact of the financial crisis on firms' labour demand

There is a little evidence of the impact of the financial crisis on labour demand both in Europe and in in TE's. Bohachova et al. [2011] studied the employment response to the financial crisis in Germany. They estimate a dynamic labour demand function for the years 2000-2009 accounting for the degree of working time flexibility and the presence of works councils. They found that employment hardly changed over the crisis because of firm's labour hoarding (due to working time flexibility and the

presence of works councils).

Babetski et al. [2012] find that, in Czech manufactoring firms, both the wage and sales employment elasticities increased during the crisis, suggesting that firms became demand constrained because of the fall in external demand, but only the sales elasticity is significantly different (data until 2009 [4]). They also find coefficients on the lagged dependent variable capturing the persistence of labour demand, of beween 30 and 40%, which are quite low given that usually, in absence of a crisis, the coefficients are higher in magnitude (around 80%). This finding suggests less persistence in employment, and that both sales and wages were channels through which firms adjusted to the crisis.

EBRD [2011] examines how the crisis affected the economic well-being of households, making direct reference to unemployment using the 2010 EBRD-World Bank Life in Transition Survey II (LiTS). The results show heterogeneity in the increase in unemployment. They show that an index of the strength of the crisis on households and the rise in unemployment are strongly positively correlated. According to the impact index [5], the hardest-hit transition countries during the financial crisis were those in the Baltic region and in South-Eastern Europe (FYR Macedonia, Latvia, Lithuania, Moldova, Montenegro, Romania and Serbia). Tajikistan, which saw a sharp decline in remittances due to a return of migrant workers, is also in this group. At the other end of the spectrum, countries where the crisis impact appears to have been relatively mild included the Czech Republic, Georgia, the Kyrgyz Republic and Poland.

EBRD [2010] studies how unemployment rates reacted to the financial crisis. The report finds that as early as mid-2008, unemployment rates soared in the Baltic states and other economies where growth had begun to slow in 2007 (for example, Turkey and Ukraine). In contrast, in central and South-Eastern Europe, unemployment rates started to increase only in mid-2009, and even later in South-Eastern Europe. Despite gradual declines by the second quarter of 2010 in some countries, unemployment remains high. The aim of this study is to provide some microeconomic evidence on the scale of the adjustment labour demand process across TEs.

[4] This was just the beginning of the crisis in the transition region

[5] The crisis event impact summarises the crisis impacts, job loss, business closure, reduced wages, reduced hours and fewer remittances (See EBRD [2011] pg. 52)

Entry to the European Union (EU) could have been a source of heterogeneity in the firm's labour demand response to the financial crisis, as either it could have given access to EU subsidies, or guaranteed more regulation of labour markets. Both access to subsidies and more regulations should have smoothed the impact of the crisis on firm's labour demand. Firms which had to face the economic downturn, the consequent reduction of sales and profits and the credit crunch could have benefited from EU policies, resulting in the termination of fewer workers. Thus, this study tests the hypothesis that firms reacted differently to the 2008/9 financial crisis in the EU-non EU regions.

3.3 Empirical strategy

3.3.1 Data description

The dataset used is the Business Environment Enterprise Performance Survey (BEEPS) which consists of cross-sectional data in 4 waves from 2002 to 2012. The data are not a panel, but data were aggregated at the industry level in order to create a pseudo-panel. The survey provides firm-level data on the business environment and performance of firms, including business-government relations, firm financing, labour, infrastructure, informal payments and corruption, and other topics such as training and innovation.

Table 3.1 describes the main variables used for the analysis.

The twenty-seven transition countries included in the sample are listed in Table 3.2 below. Ten of them are part of the European Union and among those, just Croatia entered the EU after the financial crisis.

Table 3.1: **Variable definitions**

Variable	Definition
N. of permanent workers	N. of paid employees that are contracted for a term of one or more fiscal years and/or have a guaranteed renewal of their employment contract and that worked full-time
N. of temporary workers	N. of full-time employees paid short-term (i.e. for less than a fiscal year) with no guarantee of renewal of their employment contract
Share of temporary workers	N. of part time employees over the number of full-time employees
Sales	Total annual sales in the last fiscal year for all products and services
Labour costs	Total annual cost of labour including wages, salaries, bonuses, social payments
Labour regulations	To what degree are labour regulations an obstacle to the current operations of this establishment?
Innovation (Dummy)	During the last three years, has this establishment introduced any new or significantly improved methods for the production or supply of products or services?
Research and development (Dummy)	During the last three years, did this establishment spend on research and development activities either in-house or contracted with other companies (outsourced)?
Subsidy (Dummy)	Over the last three years has this establishment received any subsidies from the national, regional or local governments or European Union sources? Yes/No
Share of exports	Share of direct exports over total sales in the last fiscal year

Table 3.2: **Countries in the sample**

EU	Non-EU
Croatia (Jun 2012)	Albania
Bulgaria (Jan 2007)	Belarus
Czech Republic (Jan 2004)	Tajikistan
Estonia (Jan 2004)	Turkey
Hungary (Jan 2004)	Ukraine
Latvia (Jan 2004)	Uzbekistan
Lithuania (Jan 2004)	Russia
Slovenia (Jan 2004)	Kazakhstan
Poland (Jan 2004)	Moldova
Romania (Jan 2007)	Azerbaijan
	FYR Macedonia
	Armenia
	Kyrgyz Republic
	Slovak Republic
	Georgia
	Bosnia and Herzegovina
	Serbia and Montenegro

The data were aggregated to 1-digit industry level, taking the average across different sectors, firm sizes and different countries in order to build-up a pseudo-panel as shown in Table 3.3 below. The pseudo-panel includes 6 sectors and 4 survey waves. The final sample size is 636 observations.

Table 3.3: **Pseudo-panel structure**

Sector	**Survey waves**				
	2002	2005	2008/2009	2012/2013	Total
Manufacturing	27	21	27	27	102
Mining and quarrying	21	27	27	27	102
Construction	27	27	27	27	108
Transport	27	27	27	27	108
Wholesale/retail/ services for motor vehicles	27	27	27	27	108
Other services	27	27	27	27	108
Total	156	156	162	162	636

Table 3.1 contains the definitions of the main variables used for the analysis, while sub-section 3.7.2 in the Appendix shows how these were harmonised across different survey waves. Tables 3.17 - 3.24 in Appendix show the variation over time of the mean of the main variables across sectors both in European and in non-European countries.

In European countries the average number of permanent workers decreased in all sectors, with the exception of wholesale and retail trade and services for motor vehicles where it increased on average by about 62%. The sector that experienced the larger fall in the number of permanent workers is services, where the average number of permanent workers per firm decreased from about 168 to 77. The average number of temporary workers decreased as well in most of the sectors, with the exception of both construction and transport where it slightly increased. The sector where the drop in the number of temporary workers was highest is manufacturing where the average number of temporary workers per firm dropped by about 50%. Average sales decreased as well in all sectors. The sharpest drop can be observed for manufacturing firms, for firms engaged in wholesale/retail trade and services for motor vehicles. Average total labour costs per firm increased between 2009/10 and 2012/13 in all the sectors, especially for firms engaged in wholesale/retail trade, and services for motor vehicles.

In non-European countries the average number of permanent workers decreased

in all sectors. The sector that experienced the larger shrink in the number of permanent workers is transport, where the average number of permanent workers per firm more than halved. The average number of temporary workers decreased as well in most of the sectors with an exception for mining and quarrying where it slightly increased. Average sales decreased as well in all the sectors. The sharpest drop can be observed both for transport firms and for firms engaged in wholesale/retail trade and services for motor vehicles. The average total labour costs per firm decreased between 2009/10 and 2012/13 in all the sectors especially for firms engaged in wholesale/retail trade and services for motor vehicles.

Thus, a comparison of European and non-European firms finds similar patterns of variation in the labour demand and in the labour demand determinants.

Figures 3.3 and n. 3.4 show the kernel densities of the average number of permanent workers by sector over time. The blue line represents the density in the post-crisis period, showing a fall in the average number of permanent workers in all sectors of about between 25 and 50 %. Figures 3.5 and 3.6 show the kernel densities of the average number of temporary workers by sector over time. Also the average number of temporary workers shrinks towards the zero over time but less evidently (of about 25%), suggesting that mostly permanent workers were fired during the crisis. However, the figures 3.3 and 3.4 represent a very rough representation of the variation in the dependent variables.

Figure 3.3: **Average number of permanent workers by survey wave and by sector**

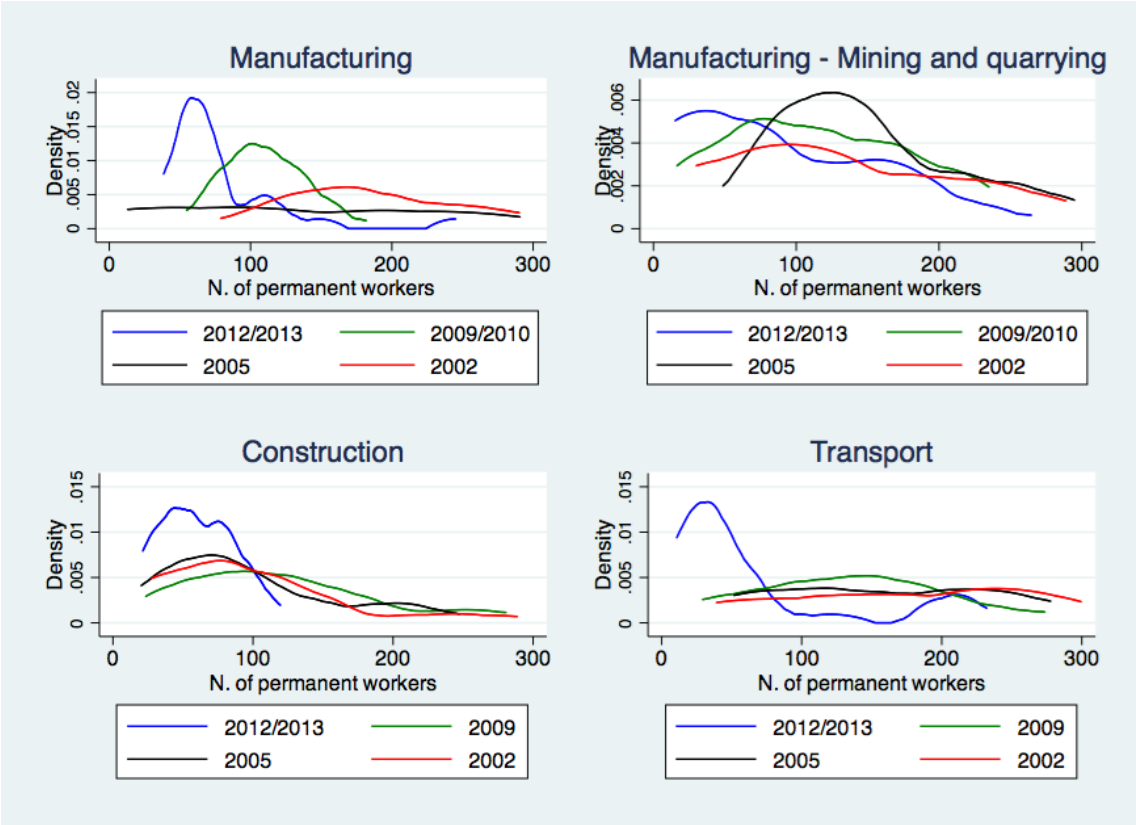


Figure 3.4: **Average number of permanent workers by survey wave and by sector**

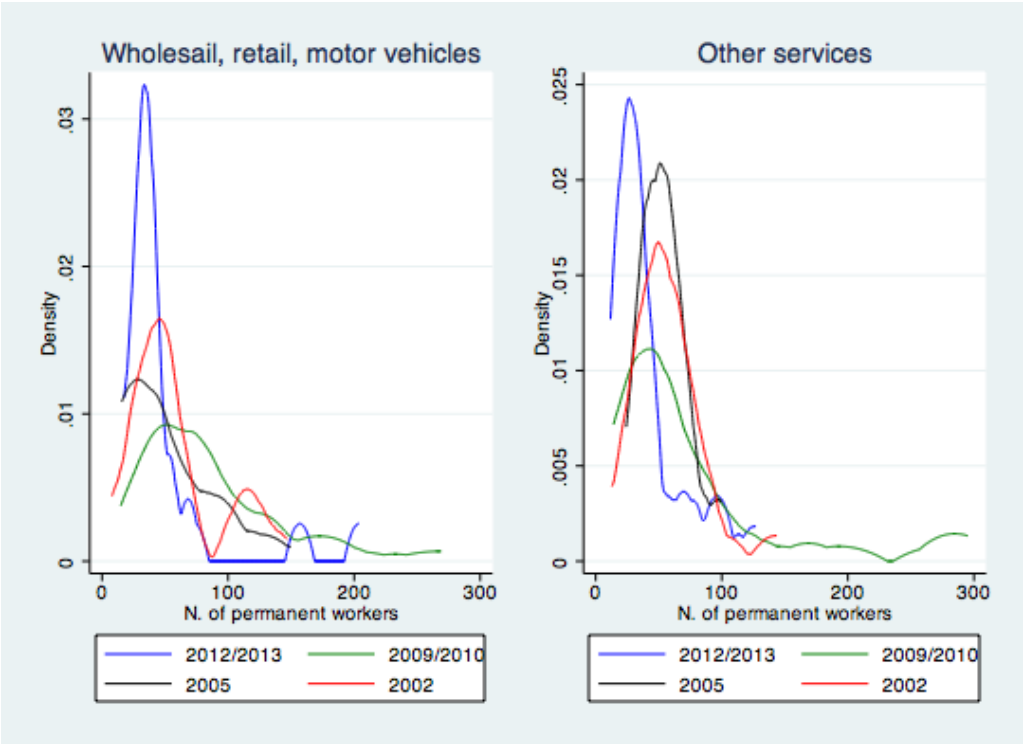


Figure 3.5: **Average number of temporary workers by survey wave and by sector**

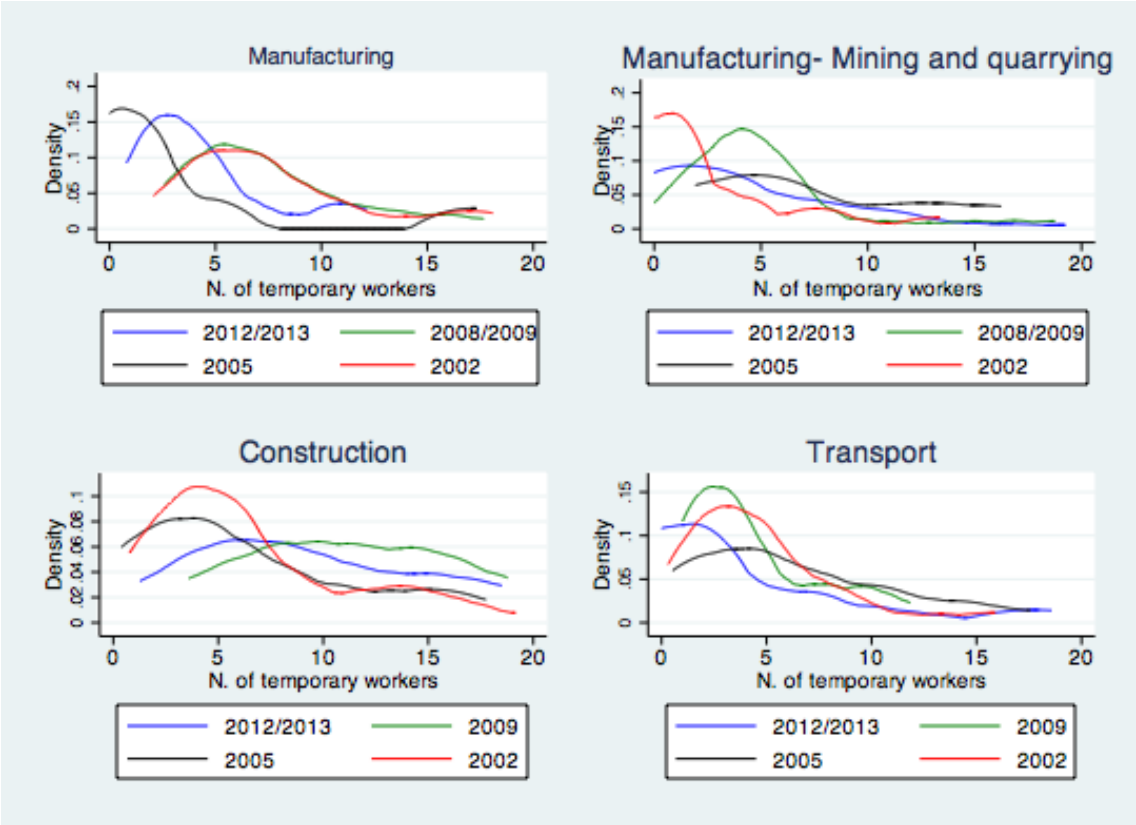


Figure 3.6: **Average number of temporary workers by survey wave and by sector**

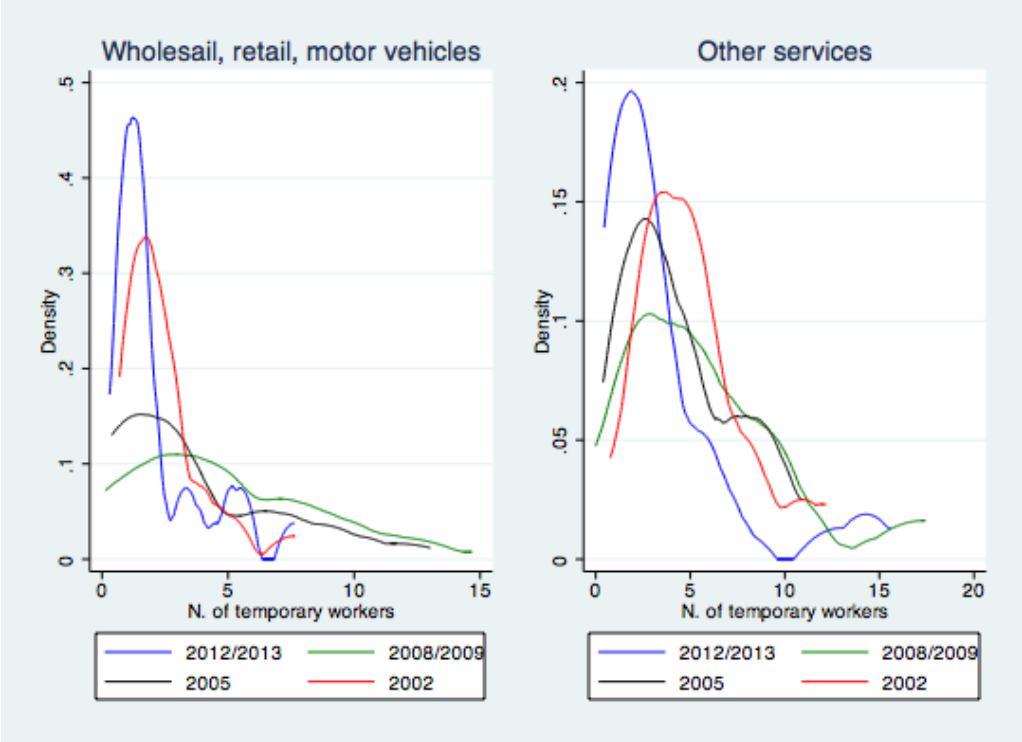
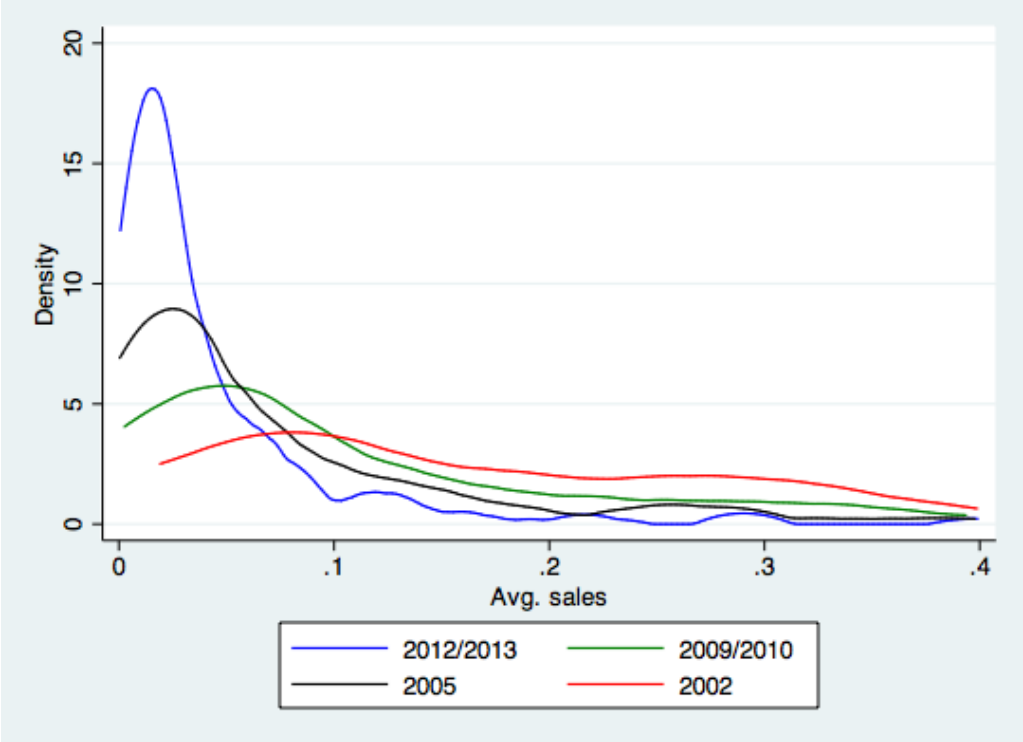


Figure 3.7: **Average labour costs by survey wave and by sector**

Figure 3.8: **Average sales by survey wave and by sector**



3.3.2 Estimation of a Labour Demand Function from Panel Data

The purpose of this section is to to give the theoretical framework underlying the estimation. The focus of this chapter is to compare the coefficient on the lagged number of employees that accounts for the persistence of employment between EU-non EU countries. This coefficient identifies the impact of the financial crisis on firms' labour demand as it captures the change in firms' labour demand between 2008/9 and 2012/13.

Assuming a CES technology the production function is (see Hamermesh [1996]):

$$Y = [\alpha L^{\rho} + (1-\alpha)K^{\rho}]^{1/\rho} \tag{3.1}$$

where α and ρ are parameters. The marginal products are:

$$D'Y/D'L = \alpha(Y/L)^{1/\rho} \tag{3.2}$$

and

$$D'Y/D'K = [1-\alpha](Y/K)^{1/\rho} \tag{3.3}$$

since the ratio of 3.5 and 3.2 is equal to the factor-price ratio, taking logarithms, differentiating with respect to $ln(w/r)$, and making $\sigma >= 0$, yields the elasticity of substitution:

$$-D'ln(L/K)/D'ln(w/r) = \sigma = 1/[1/\rho] \tag{3.4}$$

The CES cost function can be derived (see Ferguson [2008] p. 167) as:

$$C = Y[\alpha^{\sigma} w^{1-\sigma} + [1-\alpha]^{\sigma} r^{1-\sigma}]^{1/(1-\sigma)} \tag{3.5}$$

where, as before, $\sigma = 1/[1/\rho] >= 0$ The demand for labour is:

$$L = D'C/D'w = \alpha^{\sigma} w^{-\sigma} Y \tag{3.6}$$

Taking logarithms in 3.6 yields:

$$lnL = \alpha - \sigma lnw + lnY \tag{3.7}$$

The empirical model derived from 3.7 is specified as:

$$lnl_{scti} = \alpha_1 + \alpha_2 lnl_{scti-1} + \alpha_3 lnY_{scti} + \alpha_4 lnw_{scti} + \alpha_5 lnZ_{scti} + YearF.E. + SectorF.E. + u_{scti} \tag{3.8}$$

where:

- i: size of the firm (small, medium, large)
- s: sector of the firm
- c: country
- t: survey wave
- l_{scti-1}: Lagged n.of employees. It accounts for the persistence of employment. This coefficient identifies the impact of the financial crisis on firms' labour demand as it captures the change in firms' labour demand between 2008/9 and 2012/13.
- Y_{scti}: Firm level ouput/sales measured at the beginning of the previous fiscal year
- w_{scti}: Labour costs measured at the beginning of the previous fiscal year
- Z_{scti}: Vector of control variables

Following Buch et al. [2005] the empirical specification also includes a lagged term which allows a partial adjustment process to be modeled and the persistence of labour demand to be estimated. Lagged employment accounts for the fact that hiring and firing costs may cause employment persistence. All variables are specified in logs, and we can therefore interpret the coefficients as elasticities.

I follow Slaughter [2001] in assuming that the labour supply faced by the individual firm is perfectly elastic. In this case, changes in the labour supply schedule

allow changes in labour demand to be observed, and therefore coefficients estimates can be interpreted as labour demand elasticities.

3.3.3 Identification strategy

According to the specification used in order to estimate dynamic labour demand time and industry FE are included to capture price/cost of capital changes for which the survey does not provide reliable firm-level estimates. Since the residuals are correlated with the endogenous variables, in fixed effects estimates endogeneity persists because of both simultaneity and time varying unobserved heterogenity. Thus, sales and wages should be treated as endogenous and their first lags can be used as an IV.

3.4 Results

The impact of the financial crisis on the persistence of firm's labour demand both in European and in non-European countries is analysed using both OLS and an IV estimator proposed by Anderson-Hsiao (AH) that uses the first lags of the explanatory variables as instruments [6]. The dataset contains information on both permanent and temporary workers, the share of temporary workers, total annual sales of the firm, total annual labour costs, the degree of labour regulations imposed to the firm (defined as a categorical variable), an indicator of both innovation and R&D activity of the firm in the last 3 years, a dummy variable that indicates if the firm received a subsidy over the last three years and a measure of the share of direct exports over total sales in the last fiscal year.

The results are given in Table 3.4 - 3.6. Table 3.4 shows that the IV estimate of the persistence of permanent employment in transition countries over this period (2008-2012) is, on average, about 9.5%, but it is not significant. This estimate is quite low compared to the findings in the current literature (usually between 30% and 80%. The reason for low persistence could be due to the adjustment of firm's labour demand to the credirunchand to the fall in consumption/output . The elasticity of employment of permanent workers with respect to sales is about 12.6% and it is significant at the 10% level of significance (Table 3.4 column 4). Table 3.5 shows that the estimated elasticity is negative implying that the share of temporary

[6]The period covered by the dataset is not long enough to allow for Arrellano-Bond GMM estimation (Arellano and Bond [1991])

workers is volatile over this period and it decreases of about 23% with respect to the previous year significantly at the 5% level. Table 3.6 shows instead no significant effect on the number of temporary workers. The first stages of the IV estimates are all significant and are reported in the Appendix, Tables 3.26 - 3.28. Estimating the persistence over the crisis period of the share of temporary workers rather than the absolute number of temporary workers in a firm sheds light on the substitutability between temporary and permanent workers during the economic downturn.

Overall, the results seem to suggest that the financial crisis decreased more temporary labour demand in transition countries rather than firm's labour demand of permanent workers. This finding is in contrast with Figures 3.3-3.6 which seem to suggest that the number of permanent workers decreased more than the number of temporary workers. The difference can be explained by the fact that in the regressions we control for other covariates (sales, labour costs etc.) that could have an impact on the outcome variables. It seems reasonable to think that firm's labour demand adjusts through temporary workers as they have more flexible contracts.

Table 3.4: **Dynamic labour demand estimation on the n. of permanent workers**

VARIABLES	(1) OLS	(2) OLS	(3) IV	(4) IV
log (labour costs)		0.0323	0.0683	0.0547
		(0.0301)	(0.0560)	(0.0563)
log (sales)		0.0674**	0.0690	0.127*
		(0.0304)	(0.0476)	(0.0658)
log (n. permanent) (t-1)	-0.239***	-0.337***	0.0816	0.0973
	(0.0437)	(0.0410)	(0.162)	(0.167)
labour regulations				0.0537
				(0.0700)
legal status				-0.322
				(0.264)
Constant	4.662***	5.379***		
	(0.176)	(0.189)		
Observations	646	646	646	646
R-squared	0.097	0.301	-0.081	-0.192
Number of nid	323	323	323	323

Notes: Heteroskedasticity robust s.e.
*** p<0.01, ** p<0.05, * p<0.1
The dependent variables are averages by country, sector, year and size (see Table 3.1 for definitions). Both sales and labour costs are specified in 1000 dollars (see the Appendix section 3.7.2). The countries in the sample are listed in Table 3.2

Table 3.5: **Dynamic labour demand estimation on the share of temporary workers**

VARIABLES	(1) OLS	(2) OLS	(3) IV	(4) IV
log (labour costs)		0.00537	0.00257	0.00284
		(0.00371)	(0.00785)	(0.00774)
log (sales)		-0.00375	-0.00580	-0.00821
		(0.00380)	(0.00721)	(0.00851)
share of temporary (t-1)	-0.466***	-0.475***	-0.245**	-0.238**
	(0.0726)	(0.0729)	(0.112)	(0.114)
labour regulations				0.0107
				(0.00747)
legal status				0.00871
				(0.0206)
Constant	0.122***	0.138***		
	(0.00581)	(0.0122)		
Observations	646	646	646	646
R-squared	0.196	0.202	0.136	0.121
Number of nid	323	323	323	323

Notes: Heteroskedasticity robust s.e.
*** p<0.01, ** p<0.05, * p<0.1
The dependent variables are averages by country, sector, year and size (see Table 3.1 for definitions). Both sales and labour costs are specified in 1000 dollars (see the Appendix section 3.7.2). The countries in the sample are listed in Table 3.2

Table 3.6: **Dynamic labour demand estimation on the number of temporary workers**

VARIABLES	(1) OLS	(2) OLS	(3) IV	(4) IV
log (labour costs)		0.671	1.587	1.199
		(0.440)	(1.405)	(1.265)
log (sales)		-0.0288	0.141	1.659*
		(0.549)	(0.799)	(0.879)
n. temporay (t-1)	-0.00434	-0.00484	0.00739	-0.00173
	(0.00664)	(0.00683)	(0.00970)	(0.00552)
labour regulations				1.665
				(1.552)
legal status				-8.460**
				(3.955)
Constant	8.098***	11.14***		
	(0.109)	(1.239)		
Observations	646	646	646	646
R-squared	0.002	0.015	-0.038	-0.050
Number of nid	323	323	323	323

Notes: Heteroskedasticity robust s.e.
*** p<0.01, ** p<0.05, * p<0.1
The dependent variables are averages by country, sector, year and size (see Table 3.1 for definitions). Both sales and labour costs are specified in 1000 dollars (see the Appendix section 3.7.2). The countries in the sample are listed in Table 3.2

This paper also studies the differences in the labour demand response to the financial crisis of both European and non-European firms. The results are reported in Table 3.7 - 3.12

The persistence of the share of the labour demand of temporary workers is lower in non-European countries (it decreases about 25%, significant at the 10% level of confidence) see Table 3.11 and it is more volatile than in European countries where the persistence of firm's labour demand is about 25%, even though not significant, as shown in Table 3.8. The first stages of the IV estimates are reported in the Appendix, Tables 3.29 - 3.34.

Table 3.7: **Dynamic labour demand estimation on the n. of permanent workers in European countries**

	(1)	(2)	(3)	(4)
VARIABLES	OLS	OLS	IV	IV
log (labour costs)		0.0583	0.0232	0.00302
		(0.0411)	(0.0802)	(0.0791)
log (sales)		0.0296	0.0760	0.114
		(0.0400)	(0.0674)	(0.0933)
log (n. permanent) (t-1)	-0.174***	-0.282***	-0.0586	-0.0393
	(0.0594)	(0.0634)	(0.133)	(0.128)
labour regulations				0.0901
				(0.0787)
legal status				-0.146
				(0.310)
Constant	4.407***	5.116***		
	(0.239)	(0.282)		
Observations	274	274	274	274
R-squared	0.062	0.225	0.096	0.045
Number of nid	137	137	137	137

Notes: Heteroskedasticity robust s.e.
*** p<0.01, ** p<0.05, * p<0.1
The dependent variables are averages by country, sector, year and size (see Table 3.1 for definitions). Both sales and labour costs are specified in 1000 dollars (see the Appendix section 3.7.2). The countries in the sample are listed in Table 3.2

Table 3.8: **Dynamic labour demand estimation on the share of temporary workers in European countries**

VARIABLES	(1) OLS	(2) OLS	(3) IV	(4) IV
log (labour costs)		0.00511	0.000749	-0.00104
		(0.00378)	(0.00971)	(0.00938)
log (sales)		-0.00668*	-0.000667	0.000667
		(0.00345)	(0.00912)	(0.0132)
share of temporary (t-1)	-0.653***	-0.668***	0.00564	0.00330
	(0.103)	(0.103)	(0.223)	(0.249)
labour regulations				0.0103
				(0.0105)
legal status				-0.00373
				(0.0319)
Constant	0.122***	0.131***		
	(0.00758)	(0.0135)		
Observations	274	274	274	274
R-squared	0.367	0.380	-0.006	0.003
Number of nid	137	137	137	137

Notes: Heteroskedasticity robust s.e.
*** p<0.01, ** p<0.05, * p<0.1
The dependent variables are averages by country, sector, year and size (see Table 3.1 for definitions). Both sales and labour costs are specified in 1000 dollars (see the Appendix section 3.7.2). The countries in the sample are listed in Table 3.2

Table 3.9: **Dynamic labour demand estimation on the number of temporary workers in European countries**

	(1)	(2)	(3)	(4)
VARIABLES	OLS	OLS	IV	IV
log (labour costs)		0.662	0.266	-0.222
		(0.922)	(2.060)	(1.719)
log (sales)		-0.794	-0.101	1.857
		(1.075)	(1.778)	(1.658)
n. temporay (t-1)	-0.0335	-0.0327	-0.000116	-0.0146
	(0.0659)	(0.0650)	(0.0966)	(0.116)
labour regulations				0.147
				(1.884)
legal status				-8.040
				(5.975)
Constant	8.081***	9.257***		
	(0.659)	(2.203)		
Observations	274	274	274	274
R-squared	0.004	0.009	-0.001	-0.014
Number of nid	137	137	137	137

Notes: Heteroskedasticity robust s.e.
*** p<0.01, ** p<0.05, * p<0.1
The dependent variables are averages by country, sector, year and size (see Table 3.1 for definitions). Both sales and labour costs are specified in 1000 dollars (see the Appendix section 3.7.2). The countries in the sample are listed in Table 3.2

Table 3.10: **Dynamic labour demand estimation on the number of permanent workers in non European countries**

VARIABLES	(1) OLS	(2) OLS	(3) IV	(4) IV
log (labour costs)		0.517	2.129	2.054
		(0.425)	(1.896)	(1.817)
log (sales)		0.691	0.867	1.800
		(0.567)	(0.963)	(1.261)
n. temporay (t-1)	-0.00399	-0.00484	0.00912	0.00183
	(0.00644)	(0.00675)	(0.0136)	(0.00358)
labour regulations				3.807
				(2.672)
legal status				-8.919*
				(5.281)
Constant	8.317***	13.24***		
	(0.137)	(1.789)		
Observations	372	372	372	372
R-squared	0.002	0.044	-0.082	-0.094
Number of nid	186	186	186	186

Notes: Heteroskedasticity robust s.e.
*** p<0.01, ** p<0.05, * p<0.1
The dependent variables are averages by country, sector, year and size (see Table 3.1 for definitions). Both sales and labour costs are specified in 1000 dollars (see the Appendix section 3.7.2). The countries in the sample are listed in Table 3.2

Table 3.11: **Dynamic labour demand estimation on the share of temporary workers in non European countries**

VARIABLES	(1) OLS	(2) OLS	(3) IV	(4) IV
log (labour costs)		0.00515	0.00271	0.00374
		(0.00556)	(0.0108)	(0.0111)
log (sales)		-0.00180	-0.00849	-0.0122
		(0.00589)	(0.00994)	(0.0116)
share of temporary (t-1)	-0.373***	-0.388***	-0.274**	-0.255*
	(0.0832)	(0.0840)	(0.136)	(0.144)
labour regulations				0.0105
				(0.0135)
legal status				0.0178
				(0.0308)
Constant	0.123***	0.146***		
	(0.00705)	(0.0170)		
Observations	372	372	372	372
R-squared	0.128	0.140	0.060	0.028
Number of nid	186	186	186	186

Notes: Heteroskedasticity robust s.e.
*** p<0.01, ** p<0.05, * p<0.1
The dependent variables are averages by country, sector, year and size (see Table 3.1 for definitions). Both sales and labour costs are specified in 1000 dollars (see the Appendix section 3.7.2). The countries in the sample are listed in Table 3.2

Table 3.12: **Dynamic labour demand estimation on number of temporary workers in non European countries**

VARIABLES	(1) OLS	(2) OLS	(3) IV	(4) IV
log (labour costs)		0.517	2.129	2.054
		(0.425)	(1.896)	(1.817)
log (sales)		0.691	0.867	1.800
		(0.567)	(0.963)	(1.261)
n. temporay (t-1)	-0.00399	-0.00484	0.00912	0.00183
	(0.00644)	(0.00675)	(0.0136)	(0.00358)
labour regulations				3.807
				(2.672)
legal status				-8.919*
				(5.281)
Constant	8.317***	13.24***		
	(0.137)	(1.789)		
Observations	372	372	372	372
R-squared	0.002	0.044	-0.082	-0.094
Number of nid	186	186	186	186

Notes: Heteroskedasticity robust s.e.
*** p<0.01, ** p<0.05, * p<0.1
The dependent variables are averages by country, sector, year and size (see Table 3.1 for definitions). Both sales and labour costs are specified in 1000 dollars (see the Appendix section 3.7.2). The countries in the sample are listed in Table 3.2

3.5 Robustness checks

Table 3.13 in this section shows the same IV estimates discussed in section 3.4 but introducing more controls that could affect firms' labour demand. In particular, subsidy is a dummy variable which reveals if the firm received a subsidy over the last three years, research and development it indicates if the firm engaged in any research and development activity in the previous three years and share of exports is a variable that describes the firm's share of exports in the previous year. The variables might be endogenous. However, the main coefficients of interests are robust to the introduction of these extra explanatory variables. In particular, the share of temporary workers significantly decreased of about 22.5 percentage points between 2005 and 2007/8, while both the coefficient on the lag of the number of permanent and temporary workers is not significant.

Tables 3.14, 3.15 and 3.16 in this section show the results as in section 3.4 but estimated with random effects instead of fixed effects. The coefficients of interests in these regressions are significantly different from those in section 3.4 as they show a significant increase both in the number of permanent and in the share of temporary workers. The difference in the results suggests that the RE estimates are inconsistent.

Table 3.13: **Dynamic labour demand estimation on all the dependent variables, more controls**

	(1)	(2)	(3)
	(n. of temporary workers)	(share of temporary workers)	(log (n. of permanent workers))
VARIABLES	IV	IV	IV
log (labour costs)	1.128	0.00174	0.0396
	(1.406)	(0.00772)	(0.0620)
log (sales)	1.661*	-0.00541	0.144**
	(0.862)	(0.00774)	(0.0701)
n. temporay (t-1)	-0.00231		
	(0.00657)		
labour regulations	1.674	0.0141*	0.0574
	(1.544)	(0.00770)	(0.0686)
legal status	-7.025**	0.00838	-0.256
	(3.234)	(0.0199)	(0.237)
research and development	-4.500	0.0247	-0.0803
	(9.479)	(0.0264)	(0.276)
innovation	0.0342	-0.0326	-0.0842
	(3.825)	(0.0224)	(0.154)
subsidy	6.705	-0.0231	0.589**
	(8.417)	(0.0244)	(0.248)
share of exports	-0.0316	-9.81e-05	-5.26e-06
	(0.0946)	(0.000410)	(0.00309)
share of temporary (t-1)		-0.225**	
		(0.114)	
log (n. permanent) (t-1)			0.100
			(0.181)
Observations	646	646	646
R-squared	-0.037	0.142	-0.178
Number of nid	323	323	323

Notes: Heteroskedasticity robust s.e.
*** p<0.01, ** p<0.05, * p<0.1
The dependent variables are averages by country, sector, year and size (see Table 3.1 for definitions). Both sales and labour costs are specified in 1000 dollars (see the Appendix section 3.7.2). The countries in the sample are listed in Table 3.2

Table 3.14: **Dynamic labour demand estimation on the n. of permanent workers (random effects)**

VARIABLES	(1) OLS	(2) OLS	(3) IV	(4) IV
log (labour costs)		-0.00743	-0.262*	-0.199*
		(0.0243)	(0.153)	(0.115)
log (sales)		0.0555**	0.255	0.185
		(0.0234)	(0.159)	(0.120)
log (n. permanent) (t-1)	0.814***	0.768***	0.912***	0.524***
	(0.0171)	(0.0189)	(0.0285)	(0.153)
labour regulations				0.0960*
				(0.0490)
legal status				-0.0878
				(0.101)
size				0.693***
				(0.260)
Constant	0.419***	0.710***	-0.539*	-0.106
	(0.0733)	(0.113)	(0.304)	(0.243)
Observations	646	646	646	646
Number of nid	323	323	323	323

Notes:
*** p<0.01, ** p<0.05, * p<0.1
The dependent variables are averages by country, sector, year and size (see Table 3.1 for definitions). Both sales and labour costs are specified in 1000 dollars (see the Appendix section 3.7.2). The countries in the sample are listed in Table 3.2

Table 3.15: **Dynamic labour demand estimation on the share of temporary workers (random effects)**

	(1)	(2)	(3)	(4)
VARIABLES	OLS	OLS	IV	IV
log (labour costs)		0.00287	0.0819*	0.0695*
		(0.00317)	(0.0432)	(0.0419)
log (sales)		-0.00551*	-0.0849*	-0.0784*
		(0.00308)	(0.0445)	(0.0434)
share of temporary (t-1)	0.268***	0.253***	1.325***	1.845***
	(0.0426)	(0.0427)	(0.409)	(0.619)
labour regulations				0.0208
				(0.0154)
legal status				0.0437*
				(0.0251)
size				0.0450**
				(0.0216)
Constant	0.0629***	0.0634***	0.141	-0.0974
	(0.00483)	(0.00927)	(0.0953)	(0.119)
Observations	646	646	646	646
Number of nid	323	323	323	323

Notes:
*** p<0.01, ** p<0.05, * p<0.1
The dependent variables are averages by country, sector, year and size (see Table 3.1 for definitions). Both sales and labour costs are specified in 1000 dollars (see the Appendix section 3.7.2). The countries in the sample are listed in Table 3.2

Table 3.16: **Dynamic labour demand estimation on the number of temporary workers (random effects)**

	(1)	(2)	(3)	(4)
VARIABLES	OLS	OLS	IV	IV
log (labour costs)		1.457***	2.307	-0.595
		(0.535)	(33.69)	(5.416)
log (sales)		-0.267	-1.270	0.435
		(0.517)	(34.86)	(5.702)
n. temporay (t-1)	0.00211	0.00170	0.0158	0.0570
	(0.00460)	(0.00451)	(0.248)	(0.145)
labour regulations				0.663
				(1.373)
legal status				-1.620
				(4.613)
size				6.945***
				(2.229)
Constant	7.992***	14.07***	15.21	-5.793
	(0.652)	(1.477)	(70.91)	(9.818)
Observations	646	646	646	646
Number of nid	323	323	323	323

Notes:
*** p<0.01, ** p<0.05, * p<0.1
The dependent variables are averages by country, sector, year and size (see Table 3.1 for definitions). Both sales and labour costs are specified in 1000 dollars (see the Appendix section 3.7.2). The countries in the sample are listed in Table 3.2

3.6 Conclusions and policy implications

Was the labour demand response to the financial crisis heterogeneous across transition countries? What were the sources of heterogeneity?

A cross-country comparison of the impact of the crisis on firm's labour demand can facilitate knowledge of "what works". According to the results of this analysis the impact of the financial crisis on the share of temporary workers between 2009 and 2012 in European countries was about 24% negative and significant. Their share didn't show instead any significant variation in European countries over the period of the crisis. No significant effect is found on the number of permanent workers.

The results could be justified by the fact that different labour regulations in European countries could play a role in favouring temporary worker's labour hoarding. These finding are policy relevant as they suggest that European institutions might pay a role in controlling the level of unemployment, at least in th short run, offering job protection to workers. Most importantly, the results might suggest that during an economic downturn gender differences count as nowadays mostly women are employed part time.

Future research, making use of a longer panel survey and national data on workers could investigate both the difference between the long and the short run impact of the financial crisis on unemployment, and look for heterogeneous effects across different clusters of European countries (new members vs. old members). Finally, it would be interesting to look at the impact of the financial crisis on firm's labour demand exploring the heterogeneity of its impact across male and female employees. If it is true that part-time workers are those loosing more jobs than permanent workers during a financial turmoil, and if women are represent the largest share of employees in these jobs, then governments should keep that into account when shaping public policies.

3.7 Appendix

3.7.1 Data description

Table 3.17: **Summary statistics EU countries by sector in 2008/2009 (to be continued...)**

Variable	Mean	Std. Dev.	Min.	Max.	N
Manufactoring					
N. temporary workers	8.587	13.385	0	100.333	193
N. permanent workers	136.766	216.345	3	1675	195
Log of the n. of permanent workers	3.995	1.389	1.099	7.424	195
Share of temporary workers	0.08	0.094	0	0.833	193
Sales	24.23	103.945	0.001	1083.332	193
Labour costs	3.246	15.886	0	152.1	193
Lag of the n. of temporary workers	15.37	32.449	0	300	193
Lag of the n. of permanent workers	310.303	497.923	6.359	4400	193
Lag of the log of the n. of permanent workers	4.568	1.687	1.85	8.388	193
Log of labour costs	-2.701	2.673	-8.255	5.025	193
Log of sales	-0.498	2.822	-6.534	6.988	193
Lag of the log of labour costs	-3.312	2.508	-7.929	3.262	173
Lag of the log of sales	-1.092	2.555	-5.976	5.874	192
Second lag of the log of sales	1.134	1.919	-3.293	5.57	154
Mining and quarrying					
N. temporary workers	4.274	5.723	0	23	26
N. permanent workers	211.52	359.926	6	1675	28
Log of the n. of permanent workers	4.299	1.501	1.792	7.424	28
Share of temporary workers	0.046	0.061	0	0.233	26
Sales	36.411	131.706	0.003	686.233	27
Labour costs	4.376	18.916	0.001	98.526	27
Lag of the n. of temporary workers	17.595	33.258	0.375	130.463	28
Lag of the n. of permanent workers	324.595	427.706	10.611	1842.6	28
Lag of the log of the n. of permanent workers	4.799	1.617	2.362	7.519	28
Log of labour costs	-2.728	2.982	-7.207	4.59	27
Log of sales	-0.242	3.258	-5.972	6.531	27
Lag of the log of labour costs	-2.925	2.566	-7.131	3.152	28
Lag of the log of sales	-0.97	2.561	-5.351	4.764	28
Second lag of the log of sales	2.039	2.022	-1.244	4.834	11
Constructions					
N. temporary workers	13.614	16.353	0	76.25	33
N. permanent workers	98.369	100.941	5.667	290.286	33
Log of the n. of permanent workers	3.99	1.163	1.735	5.671	33
Share of temporary workers	0.119	0.104	0	0.53	33
Sales	15.913	47.528	0.01	222.444	33
Labour costs	1.935	5.762	0.002	25.356	33
Lag of the n. of temporary workers	7.703	11.41	0	60	33
Lag of the n. of permanent workers	212.424	316.345	8.182	1658	33
Lag of the log of the n. of permanent workers	4.437	1.491	2.102	7.413	33
Log of labour costs	-2.492	2.502	-6.203	3.233	33
Log of sales	-0.449	2.606	-4.574	5.405	33
Lag of the log of labour costs	-3.477	2.274	-6.679	2.179	31
Lag of the log of sales	-1.203	2.506	-4.928	4.172	33
Second lag of the log of sales	0.778	1.801	-2.831	5.57	29

Table 3.18: **Summary statistics EU countries by sector in 2008/2009 (... continued)**

Variable	Mean	Std. Dev.	Min.	Max.	N
Transports					
N. temporary workers	7.457	10.445	0	37.308	33
N. permanent workers	156.477	255.403	7.25	1222.846	33
Log of the n. of permanent workers	3.977	1.49	1.981	7.109	33
Share of temporary workers	0.073	0.091	0	0.345	33
Sales	11.62	30.237	0.012	143.335	33
Labour costs	1.078	3.506	0.001	17.049	33
Lag of the n. of temporary workers	25.159	41.048	0	187.75	33
Lag of the n. of permanent workers	394.003	540.804	7.043	2074.4	33
Lag of the log of the n. of permanent workers	4.688	1.858	1.952	7.637	33
Log of labour costs	-2.803	2.449	-6.55	2.836	33
Log of sales	-0.497	2.656	-4.41	4.965	33
Lag of the log of labour costs	-3.176	2.549	-7.438	2.303	33
Lag of the log of sales	-1.417	2.442	-5.53	3.45	33
Second lag of the log of sales	1.172	2.03	-2.023	5.406	32
Wholesale/retail /services for motor vehicles					
N. temporary workers	9.054	13.11	0	58.833	34
N. permanent workers	164.643	245.548	5	1058.407	34
Log of the n. of permanent workers	3.972	1.588	1.609	6.965	34
Share of temporary workers	0.063	0.035	0	0.126	34
Sales	52.813	195.432	0.026	1083.332	33
Labour costs	5.473	26.165	0.001	152.1	34
Lag of the n. of temporary workers	13.727	19.625	0.459	65.444	33
Lag of the n. of permanent workers	247.333	324.158	6.359	1184.833	33
Lag of the log of the n. of permanent workers	4.383	1.749	1.85	7.077	33
Log of labour costs	-2.596	2.742	-6.851	5.025	34
Log of sales	0.142	2.821	-3.649	6.988	33
Lag of the log of labour costs	-3.697	2.747	-7.929	3.262	33
Lag of the log of sales	-1.183	2.761	-5.583	5.874	33
Second lag of the log of sales	1.438	2.106	-3.069	5.376	33
Other services					
N. temporary workers	13.854	32.101	0	300	129
N. permanent workers	168.372	263.326	3	1435	129
Log of the n. of permanent workers	4.034	1.574	1.099	7.269	129
Share of temporary workers	0.1	0.097	0	0.833	129
Sales	6.663	39.202	0.001	439.008	129
Labour costs	1.581	10.98	0	105.41	93
Lag of the n. of temporary workers	14.152	33.55	0	300	95
Lag of the n. of permanent workers	193.878	293.152	3.5	1435	95
Lag of the log of the n. of permanent workers	4.174	1.597	1.253	7.269	95
Log of labour costs	-3.767	2.66	-8.255	4.658	93
Log of sales	-1.418	2.705	-6.556	6.085	129
Lag of the log of labour costs	-3.349	2.601	-8.255	4.658	62
Lag of the log of sales	-0.881	2.61	-6.534	6.085	95
Second lag of the log of labour costs	-3.768	2.391	-7.353	2.318	29
Second lag of the log of sales	-0.61	2.497	-5.976	3.972	62

Table 3.19: **Summary statistics EU countries by sector in 2012/2013 (to be continued...)**

Variable	Mean	Std. Dev.	Min.	Max.	N
Manufactoring					
N. temporary workers	3.962	5.484	0	26.722	33
N. permanent workers	105.8	115.097	8.979	391.263	33
Log of the n. of permanent workers	3.933	1.316	2.195	5.969	33
Share of temporary workers	0.04	0.028	0	0.123	33
Sales	12.021	65.138	0.003	374.727	33
Labour costs	0.109	0.357	0	1.894	33
Lag of the n. of temporary workers	6.829	9.663	0.292	48.587	33
Lag of the n. of permanent workers	104.088	107.431	10.536	348.704	33
Lag of the log of the n. of permanent workers	4.021	1.199	2.355	5.854	33
Log of labour costs	-4.591	2.022	-7.864	0.639	33
Log of sales	-2.322	2.529	-5.953	5.926	33
Lag of the log of labour costs	-2.67	2.704	-6.691	4.099	33
Lag of the log of sales	-0.474	2.652	-5.068	5.546	33
Second lag of the log of labour costs	-2.861	2.585	-6.685	1.159	15
Second lag of the log of sales	0.118	2.408	-4.183	4.456	32
Mining and quarrying					
N. temporary workers	3.684	8.646	0	40	28
N. permanent workers	163.077	475.966	6	2530	28
Log of the n. of permanent workers	3.746	1.418	1.792	7.836	28
Share of temporary workers	0.046	0.058	0	0.213	28
Sales	1.38	6.334	0	33.02	27
Labour costs	0.03	0.06	0	0.265	23
Lag of the n. of temporary workers	4.397	5.569	0	23	27
Lag of the n. of permanent workers	183.622	363.918	6	1675	28
Lag of the log of the n. of permanent workers	3.976	1.511	1.792	7.424	28
Log of labour costs	-5.006	1.913	-8.273	-1.328	23
Log of sales	-3.066	2.291	-7.955	3.497	27
Lag of the log of labour costs	-3.044	2.925	-7.036	4.59	27
Lag of the log of sales	-0.801	3.318	-5.972	6.531	27
Second lag of the log of labour costs	-3.222	2.587	-7.131	3.152	24
Second lag of the log of sales	-1.255	2.441	-5.351	4.764	26
Constructions					
N. temporary workers	16.524	36.728	0	200	32
N. permanent workers	95.931	127.705	6.385	517.5	32
Log of the n. of permanent workers	3.748	1.334	1.854	6.249	32
Share of temporary workers	0.122	0.115	0	0.667	32
Sales	0.248	0.663	0.002	3.56	32
Labour costs	0.035	0.095	0	0.513	30
Lag of the n. of temporary workers	12.899	16.082	0	76.25	32
Lag of the n. of permanent workers	92.921	97.503	5.667	290.286	32
Lag of the log of the n. of permanent workers	3.939	1.144	1.735	5.671	32
Log of labour costs	-4.944	1.84	-8.311	-0.667	30
Log of sales	-3.023	1.823	-6.251	1.27	32
Lag of the log of labour costs	-2.514	2.539	-6.203	3.233	32
Lag of the log of sales	-0.453	2.648	-4.574	5.405	32
Second lag of the log of labour costs	-3.477	2.274	-6.679	2.179	31
Second lag of the log of sales	-1.371	2.35	-4.928	3.095	32

Table 3.20: **Summary statistics EU countries by sector in 2012/2013 (...continued)**

Variable	Mean	Std. Dev.	Min.	Max.	N
Transports					
N. temporary workers	10.503	20.725	0	70.600	30
N. permanent workers	109.813	168.587	6	704.75	30
Log of the n. of permanent workers	3.755	1.405	1.792	6.558	30
Share of temporary workers	0.063	0.093	0	0.455	30
Sales	6.414	33.173	0.002	178.839	29
Labour costs	0.092	0.345	0	1.8	28
Lag of the n. of temporary workers	7.141	10.416	0	37.308	30
Lag of the n. of permanent workers	147.816	262.623	7.25	1222.846	30
Lag of the log of the n. of permanent workers	3.859	1.482	1.981	7.109	30
Log of labour costs	-5.039	2.119	-8.266	0.588	28
Log of sales	-2.84	2.294	-6.484	5.186	29
Lag of the log of labour costs	-2.956	2.503	-6.55	2.836	30
Lag of the log of sales	-0.839	2.497	-4.41	4.311	30
Second lag of the log of labour costs	-3.412	2.476	-7.438	2.303	30
Second lag of the log of sales	-1.634	2.388	-5.53	3.45	30
Wholesale/retail /services for motor vehicles					
N. temporary workers	6.469	10.02	0.086	35.154	33
N. permanent workers	264.924	732.162	7.349	4163.75	33
Log of the n. of permanent workers	4.007	1.704	1.995	8.334	33
Share of temporary workers	0.055	0.044	0.002	0.259	33
Sales	0.569	1.051	0.006	4.705	33
Labour costs	0.039	0.078	0	0.397	33
Lag of the n. of temporary workers	9.327	13.213	0	58.833	33
Lag of the n. of permanent workers	169.481	247.704	7.667	1058.407	33
Lag of the log of the n. of permanent workers	4.043	1.556	2.037	6.965	33
Log of labour costs	-4.79	1.918	-7.97	-0.923	33
Log of sales	-2.008	1.876	-5.158	1.549	33
Lag of the log of labour costs	-2.492	2.716	-6.851	5.025	33
Lag of the log of sales	0.142	2.821	-3.649	6.988	33
Second lag of the log of labour costs	-3.697	2.747	-7.929	3.262	33
Second lag of the log of sales	-1.183	2.761	-5.583	5.874	33
Other services					
N. temporary workers	11.118	25.3	0	126.667	29
N. permanent workers	77.257	110.262	6	423.25	29
Log of the n. of permanent workers	3.487	1.325	1.792	6.048	29
Share of temporary workers	0.092	0.081	0	0.343	29
Sales	0.138	0.3	0.001	1.53	29
Labour costs	0.145	0.672	0	3.503	27
Lag of the n. of temporary workers	6.806	9.803	0	37.8	29
Lag of the n. of permanent workers	77.344	95.366	3.5	384.714	29
Lag of the log of the n. of permanent workers	3.631	1.28	1.253	5.953	29
Log of labour costs	-5.196	2.092	-7.988	1.254	27
Log of sales	-3.436	1.816	-6.556	0.425	29
Lag of the log of labour costs	-3.242	2.803	-8.255	4.658	29
Lag of the log of sales	-1.644	2.851	-6.534	6.085	29
Second lag of the log of labour costs	-3.768	2.391	-7.353	2.318	29
Second lag of the log of sales	-2.157	2.367	-5.976	3.972	29

Table 3.21: **Summary statistics non EU countries by sector in 2008/2009 (to be continued...)**

Variable	Mean	Std. Dev.	Min.	Max.	N
Manufactoring					
N. temporary workers	8.882	9.766	0.686	43.095	48
N. permanent workers	143.093	203.134	11.194	1178.595	48
Log of the n. of permanent workers	4.21	1.245	2.415	7.072	48
Share of temporary workers	0.072	0.037	0.011	0.164	48
Sales	33.983	122.2	0.002	700.35	48
Labour costs	3.974	15.858	0	89.595	48
Lag of the n. of temporary workers	9.766	15.736	0	66.667	47
Lag of the n. of permanent workers	255.665	321.604	9	1387.5	48
Lag of the log of the n. of permanent workers	4.674	1.472	2.197	7.235	48
Log of labour costs	-3.989	3.263	-7.895	4.495	48
Log of sales	-1.658	3.287	-6.189	6.552	48
Lag of the log of labour costs	-5.301	3.192	-10.382	3.883	21
Lag of the log of sales	-2.266	3.296	-8.665	5.511	37
Second lag of the log of labour costs					0
Second lag of the log of sales	-0.469	3.113	-4.225	10.537	33
Mining and quarrying					
N. temporary workers	5.164	7.24	0	33.929	45
N. permanent workers	140.601	251.591	5.333	1548.067	45
Log of the n. of permanent workers	4.026	1.36	1.674	7.345	45
Share of temporary workers	0.062	0.071	0	0.344	45
Sales	40.794	162.192	0	990	45
Labour costs	3.643	14.93	0	93.75	44
Lag of the n. of temporary workers	45.386	137.63	1.206	740.167	45
Lag of the n. of permanent workers	280.047	345.59	13.286	1514.333	45
Lag of the log of the n. of permanent workers	4.696	1.518	2.587	7.323	45
Log of labour costs	-4.342	3.499	-9.121	4.541	44
Log of sales	-2.194	3.637	-8.455	6.898	45
Lag of the log of labour costs	-4.605	2.954	-9.356	3.347	42
Lag of the log of sales	-2.606	3.041	-7.179	6.051	42
Second lag of the log of labour costs					0
Second lag of the log of sales	0.069	3.989	-6.155	11.492	21
Constructions					
N. temporary workers	27.589	40.847	0	229.625	46
N. permanent workers	136.128	175.914	6.333	741.625	46
Log of the n. of permanent workers	4.128	1.299	1.846	6.609	46
Share of temporary workers	0.179	0.111	0	0.462	46
Sales	16.273	65.185	0.001	430.71	46
Labour costs	2.511	10.666	0	69.808	46
Lag of the n. of temporary workers	24.442	64.906	0	379.286	44
Lag of the n. of permanent workers	254.504	422.661	7.875	2150.333	44
Lag of the log of the n. of permanent workers	4.528	1.466	2.064	7.673	44
Log of labour costs	-4.108	3.177	-9.287	4.246	46
Log of sales	-1.894	3.15	-7.275	6.065	46
Lag of the log of labour costs	-4.871	2.891	-10.097	2.405	40
Lag of the log of sales	-2.839	3.046	-8.32	5.335	40
Second lag of the log of labour costs					0
Second lag of the log of sales	-0.839	2.712	-3.979	7.74	43

Table 3.22: **Summary statistics non EU countries by sector in 2008/2009 (... continued)**

Variable	Mean	Std. Dev.	Min.	Max.	N
Transports					
N. temporary workers	8.292	29.193	0	199.75	46
N. permanent workers	248.463	896.315	7.571	6142.111	47
Log of the n. of permanent workers	4.077	1.445	2.024	8.723	47
Share of temporary workers	0.058	0.059	0	0.222	46
Sales	50.134	258.529	0.001	1742.924	46
Labour costs	6.16	23.565	0	144.774	47
Lag of the n. of temporary workers	20.642	72.795	0	490	46
Lag of the n. of permanent workers	299.063	409.885	9.75	1591	46
Lag of the log of the n. of permanent workers	4.61	1.62	2.277	7.372	46
Log of labour costs	-3.992	3.723	-9.609	4.975	47
Log of sales	-2.269	3.68	-7.535	7.463	46
Lag of the log of labour costs	-4.621	3.198	-9.898	3.352	41
Lag of the log of sales	-2.786	3.409	-7.74	6.18	42
Second lag of the log of labour costs					0
Second lag of the log of sales	-0.661	2.971	-4.648	8.869	42
Wholesale/retail /services for motor vehicles					
N. temporary workers	5.551	10.526	0	52.6	47
N. permanent workers	112.602	165.959	7.721	845.935	47
Log of the n. of permanent workers	3.894	1.276	2.044	6.74	47
Share of temporary workers	0.052	0.034	0	0.141	47
Sales	108.48	396.287	0.002	1999.056	47
Labour costs	7.616	34.284	0	227.081	47
Lag of the n. of temporary workers	29.438	92.235	0	545.327	46
Lag of the n. of permanent workers	210.423	297.054	7.978	1462.615	47
Lag of the log of the n. of permanent workers	4.314	1.612	2.077	7.288	47
Log of labour costs	-4.187	3.614	-9.326	5.425	47
Log of sales	-1.322	3.485	-6.362	7.600	47
Lag of the log of labour costs	-5.001	3.108	-10.352	4.366	40
Lag of the log of sales	-2.458	3.167	-8.016	6.701	44
Second lag of the log of labour costs					0
Second lag of the log of sales	-0.688	3.092	-4.513	8.944	40
Other services					
N. temporary workers	7.056	11.242	0	50	46
N. permanent workers	106.339	309.207	4	2097.75	46
Log of the n. of permanent workers	3.582	1.293	1.386	7.649	46
Share of temporary workers	0.078	0.065	0	0.255	46
Sales	8.527	36.784	0	184.934	46
Labour costs	0.884	3.604	0	22.919	46
Lag of the n. of temporary workers	74.905	436.665	0	2936.042	45
Lag of the n. of permanent workers	176.182	213.01	7.313	964	45
Lag of the log of the n. of permanent workers	4.303	1.492	1.99	6.871	45
Log of labour costs	-4.942	3.145	-10.054	3.132	46
Log of sales	-3.392	3.158	-9.989	5.22	46
Lag of the log of labour costs	-4.88	3.03	-10.14	2.447	42
Lag of the log of sales	-3.353	3.038	-8.56	3.574	42
Second lag of the log of labour costs					0
Second lag of the log of sales	-1.466	2.382	-4.795	6.378	41

Table 3.23: **Summary statistics non EU countries by sector in 2012/2013 (to be continued...)**

Variable	Mean	Std. Dev.	Min.	Max.	N
Manufactoring					
N. temporary workers	8.322	10.962	0	54.5	48
N. permanent workers	123.444	159.733	8.385	625.805	48
Log of the n. of permanent workers	3.913	1.414	2.126	6.439	48
Share of temporary workers	0.063	0.045	0	0.227	48
Sales	0.527	3.094	0.001	21.461	48
Labour costs	0.052	0.256	0	1.763	48
Lag of the n. of temporary workers	8.882	9.766	0.686	43.095	48
Lag of the n. of permanent workers	143.093	203.134	11.194	1178.595	48
Lag of the log of the n. of permanent workers	4.21	1.245	2.415	7.072	48
Log of labour costs	-5.933	2.139	-9.182	0.567	48
Log of sales	-3.906	2.004	-6.693	3.066	48
Lag of the log of labour costs	-3.989	3.263	-7.895	4.495	48
Lag of the log of sales	-1.658	3.287	-6.189	6.552	48
Second lag of the log of labour costs	-5.301	3.192	-10.382	3.883	21
Second lag of the log of sales	-2.266	3.296	-8.665	5.511	37
Mining and quarrying					
N. temporary workers	7.685	10.794	0	45	45
N. permanent workers	134.737	217.454	8	911	45
Log of the n. of permanent workers	3.861	1.435	2.079	6.815	45
Share of temporary workers	0.096	0.121	0	0.553	45
Sales	0.342	1.195	0	7.100	44
Labour costs	0.044	0.191	0	1.2	44
Lag of the n. of temporary workers	4.804	6.793	0	33.929	45
Lag of the n. of permanent workers	154.451	270.272	5.333	1548.067	45
Lag of the log of the n. of permanent workers	4.045	1.42	1.674	7.345	45
Log of labour costs	-6.06	2.048	-9.341	0.182	44
Log of sales	-3.902	2.269	-8.657	1.96	44
Lag of the log of labour costs	-4.175	3.637	-9.121	4.541	44
Lag of the log of sales	-2.006	3.761	-8.455	6.898	45
Second lag of the log of labour costs	-4.674	3.055	-9.356	3.347	39
Second lag of the log of sales	-2.56	3.169	-7.179	6.051	40
Constructions					
N. temporary workers	20.47	29.302	0	174.286	47
N. permanent workers	118.018	201.866	8.571	1023	48
Log of the n. of permanent workers	3.881	1.324	2.148	6.93	48
Share of temporary workers	0.172	0.124	0	0.528	47
Sales	0.744	4.705	0.001	32.645	48
Labour costs	0.047	0.253	0	1.728	47
Lag of the n. of temporary workers	47.251	145.932	0	999	48
Lag of the n. of permanent workers	148.185	183.614	6.333	741.625	48
Lag of the log of the n. of permanent workers	4.206	1.328	1.846	6.609	48
Log of labour costs	-5.809	1.773	-8.438	0.547	47
Log of sales	-3.994	1.904	-7.091	3.486	48
Lag of the log of labour costs	-3.92	3.3	-9.287	4.246	48
Lag of the log of sales	-1.715	3.28	-7.275	6.065	48
Second lag of the log of labour costs	-4.871	2.891	-10.097	2.405	40
Second lag of the log of sales	-2.544	3.55	-8.32	9.231	41

Table 3.24: **Summary statistics non EU countries by sector in 2012/2013 (...continued)**

Variable	Mean	Std. Dev.	Min.	Max.	N
Transports					
N. temporary workers	3.04	5.202	0	19.8	38
N. permanent workers	106.35	271.585	2	1656	40
Log of the n. of permanent workers	3.442	1.397	0.693	7.412	40
Share of temporary workers	0.06	0.092	0	0.267	38
Sales	0.057	0.19	0	1.072	37
Labour costs	0.009	0.029	0	0.152	37
Lag of the n. of temporary workers	8.603	31.671	0	199.75	39
Lag of the n. of permanent workers	233.075	968.003	7.571	6142.111	40
Lag of the log of the n. of permanent workers	3.808	1.375	2.024	8.723	40
Log of labour costs	-6.724	1.82	-9.931	-1.885	37
Log of sales	-5.338	2.023	-8.752	0.07	37
Lag of the log of labour costs	-4.425	3.524	-9.609	4.138	40
Lag of the log of sales	-2.776	3.381	-7.535	5.119	39
Second lag of the log of labour costs	-5.104	3.049	-9.898	2.121	34
Second lag of the log of sales	-3.252	3.219	-7.74	3.597	35
Wholesale/retail /services for motor vehicles					
N. temporary workers	4.808	9.246	0	43.333	48
N. permanent workers	107.654	138.846	7.964	591.968	48
Log of the n. of permanent workers	3.813	1.387	2.075	6.383	48
Share of temporary workers	0.046	0.044	0	0.195	48
Sales	1.256	7.266	0.002	50.31	48
Labour costs	0.191	0.888	0	5.288	48
Lag of the n. of temporary workers	5.551	10.526	0	52.6	47
Lag of the n. of permanent workers	112.602	165.959	7.721	845.935	47
Lag of the log of the n. of permanent workers	3.894	1.276	2.044	6.74	47
Log of labour costs	-5.753	2.16	-8.691	1.665	48
Log of sales	-3.191	2.002	-6.113	3.918	48
Lag of the log of labour costs	-4.187	3.614	-9.326	5.425	47
Lag of the log of sales	-1.322	3.485	-6.362	7.600	47
Second lag of the log of labour costs	-5.001	3.108	-10.352	4.366	40
Second lag of the log of sales	-2.458	3.167	-8.016	6.701	44
Other services					
N. temporary workers	6.933	11.901	0	56.667	45
N. permanent workers	127.482	231.808	6.8	1063.667	47
Log of the n. of permanent workers	3.749	1.447	1.917	6.969	47
Share of temporary workers	0.095	0.105	0	0.417	45
Sales	0.127	0.603	0.001	4	44
Labour costs	0.008	0.019	0	0.113	44
Lag of the n. of temporary workers	10.055	22.854	0	144	47
Lag of the n. of permanent workers	117.523	309.95	4	2097.75	47
Lag of the log of the n. of permanent workers	3.663	1.358	1.386	7.649	47
Log of labour costs	-6.281	1.651	-9.047	-2.179	44
Log of sales	-4.585	1.797	-7.396	1.386	44
Lag of the log of labour costs	-4.746	3.338	-10.054	3.132	46
Lag of the log of sales	-3.082	3.444	-9.989	5.22	47
Second lag of the log of labour costs	-4.886	3.067	-10.14	2.447	41
Second lag of the log of sales	-3.101	3.473	-8.56	7.552	42

3.7.2 Variables harmonisation across survey waves

Sales and labour costs were deflated using the GDP deflator [7] at market prices using 2013 as a reference year. Then, both sales and labour costs in 2009 and in 2012/13 were expressed in local current currencies and were finally converted in thousand dollars using as currency rates those at 18th February 2015. Both the unit of measure of sales was reduced dividing by 100000000.

Table 3.25: **Sectors harmonisation across survey waves**

Sector	**Survey waves**			
	2002	**2005**	**2008/2009**	**2012/2013**
Question	s3	s3	s3	a4b
Manufactoring	3	1	15, 17, 18, 24, 25, 28, 29, 31, 2	15, 20, 22, 24, 25, 28, 29, 31, 33, 36, 16, 17, 18, 19, 21, 23, 27, 30, 32, 34, 35, 37
Mining and quarrying	1	3	26, 27	26, 27
Constructions	2	2	27	45
Transports	4	4	60	60
Wholesale/retail/ services for motor vehicles	5	5	50, 51, 52	50, 51, 52
Other services	6, 7, 8	6, 7, 8	55, 72	55, 72, 63, 64

3.8 First stage

[7] http://data.worldbank.org/indicator/NY.GDP.DEFL.ZS

Table 3.26: **Dynamic labour demand estimation on the number of permanent workers - first stage**

	(1) log (labour costs)	(2) log (sales)	(3) n. temporay (t-1)	(4) share of temporary (t-1)	(5) log (n. permanent) (t-1)
labour regulations	0.0416	0.102	4.371	-0.00845	0.125
	(0.844)	(0.645)	(0.206)	(0.133)	(0.056)
legal status	2.471***	2.411***	29.20	0.00619	0.664***
	(0.000)	(0.000)	(0.073)	(0.434)	(0.000)
log (labour costs) (t-1)	-0.930***	-0.166	-1.128	-0.0100*	0.135**
	(0.000)	(0.235)	(0.734)	(0.039)	(0.003)
log (sales) (t-1)	0.427**	-0.386**	5.091	0.0117*	-0.0154
	(0.001)	(0.003)	(0.117)	(0.022)	(0.670)
log (n. of permanent workers) (t-2)	-0.501	-0.519			-0.422***
	(0.069)	(0.072)			(0.000)
n. of temporary workers (t-2)			-0.0333		
			(0.432)		
share of temporary workers (t-2)				-0.432***	
				(0.000)	
N	646	646	646	646	646
F	47.29	64.21	1.100	6.262	35.19

Notes: Heteroskedasticity robust s.e.
*** p<0.01, ** p<0.05, * p<0.1
The dependent variables are averages by country, sector, year and size (see Table 3.1 for definitions). Both sales and labour costs are specified in 1000 dollars (see the Appendix section 3.7.2). The countries in the sample are listed in Table 3.2

Table 3.27: **Dynamic labour demand estimation on the number of temporary workers - first stage**

	(1) log (labour costs)	(2) log (sales)	(3) n. temporay (t-1)	(4) share of temporary (t-1)	(5) log (n. permanent) (t-1)
labour regulations	0.0197	0.0835	4.371		
	(0.926)	(0.711)	(0.206)		
legal status	2.512***	2.462***	29.20		
	(0.000)	(0.000)	(0.073)		
log (labour costs) (t-1)	-0.941***	-0.171	-1.128	-0.00980*	0.146**
	(0.000)	(0.227)	(0.734)	(0.042)	(0.002)
log (sales) (t-1)	0.468***	-0.348**	5.091	0.0112*	-0.124**
	(0.000)	(0.007)	(0.117)	(0.020)	(0.002)
n. of temporary workers (t-2)	0.0000256	-0.0000661***	-0.0333		
	(0.156)	(0.000)	(0.432)		
share of temporary workers (t-2)				-0.429***	
				(0.000)	
log (n. of permanent workers) (t-2)					-0.510***
					(0.000)
N	646	646	646	646	646
F	67.58	73.87	1.100	10.03	7.900

Notes: Heteroskedasticity robust s.e.
*** p<0.01, ** p<0.05, * p<0.1
The dependent variables are averages by country, sector, year and size (see Table 3.1 for definitions). Both sales and labour costs are specified in 1000 dollars (see the Appendix section 3.7.2). The countries in the sample are listed in Table 3.2

Table 3.28: **Dynamic labour demand estimation on the share of temporary workers - first stage**

	(1) log (labour costs)	(2) log (sales)	(3) n. temporay (t-1)	(4) share of temporary (t-1)	(5) log (n. permanent) (t-1)
labour regulations	0.0146	0.0759	4.371	-0.00845	
	(0.946)	(0.736)	(0.206)	(0.133)	
legal status	2.531***	2.469***	29.20	0.00619	
	(0.000)	(0.000)	(0.073)	(0.434)	
log (labour costs) (t-1)	-0.930***	-0.169	-1.128	-0.0100*	0.146**
	(0.000)	(0.226)	(0.734)	(0.039)	(0.002)
log (sales) (t-1)	0.462***	-0.349**	5.091	0.0117*	-0.124**
	(0.000)	(0.006)	(0.117)	(0.022)	(0.002)
share of temporary workers (t-2)	-1.205	-0.886		-0.432***	
	(0.449)	(0.577)		(0.000)	
n. of temporary workers (t-2)			-0.0333		
			(0.432)		
log (n. of permanent workers) (t-2)					-0.510***
					(0.000)
N	646	646	646	646	646
F	48.31	66.26	1.100	6.262	7.900

Notes: Heteroskedasticity robust s.e.
*** p<0.01, ** p<0.05, * p<0.1
The dependent variables are averages by country, sector, year and size (see Table 3.1 for definitions). Both sales and labour costs are specified in 1000 dollars (see the Appendix section 3.7.2). The countries in the sample are listed in Table 3.2

Table 3.29: **Dynamic labour demand estimation on the number of permanent workers in European countries - first stage**

	(1) log (labour costs)	(2) log (sales)	(3) n. temporay (t-1)	(4) share of temporary (t-1)	(5) log (n. permanent) (t-1)
labour regulations	0.246	0.198	6.643	-0.00250	0.155*
	(0.342)	(0.485)	(0.187)	(0.732)	(0.019)
legal status	2.368***	2.219***	7.203*	-0.00482	0.865***
	(0.000)	(0.000)	(0.019)	(0.716)	(0.000)
log (labour costs) (t-1)	-0.885***	-0.122	-2.083	-0.00747	0.162*
	(0.000)	(0.600)	(0.580)	(0.335)	(0.032)
log (sales) (t-1)	0.345*	-0.492**	4.000	0.00743	0.0800
	(0.047)	(0.007)	(0.352)	(0.372)	(0.254)
log (n. of permanent workers) (t-2)	-0.537	-0.446			-0.549***
	(0.116)	(0.264)			(0.000)
n. of temporary workers (t-2)			-0.0333		
			(0.358)		
share of temporary workers (t-2)				-0.241**	
				(0.007)	
N	274	274	274	274	274
F	34.64	35.58	1.488	2.003	45.74

Notes: Heteroskedasticity robust s.e.
*** p<0.01, ** p<0.05, * p<0.1
The dependent variables are averages by country, sector, year and size (see Table 3.1 for definitions). Both sales and labour costs are specified in 1000 dollars (see the Appendix section 3.7.2). The countries in the sample are listed in Table 3.2

Table 3.30: **Dynamic labour demand estimation on the number of temporary workers in European countries - first stage**

	(1) log (labour costs)	(2) log (sales)	(3) n. temporay (t-1)	(4) share of temporary (t-1)	(5) log (n. permanent) (t-1)
labour regulations	0.225	0.181	6.643	-0.00845	0.125
	(0.390)	(0.532)	(0.187)	(0.133)	(0.056)
legal status	2.400***	2.245***	7.203*	0.00619	0.664***
	(0.000)	(0.000)	(0.019)	(0.434)	(0.000)
log (labour costs) (t-1)	-0.922***	-0.152	-2.083	-0.0100*	0.135**
	(0.000)	(0.526)	(0.580)	(0.039)	(0.003)
log (sales) (t-1)	0.391*	-0.454*	4.000	0.0117*	-0.0154
	(0.037)	(0.015)	(0.352)	(0.022)	(0.670)
n. of temporary workers (t-2)	0.000193	0.0000779	-0.0333		
	(0.280)	(0.650)	(0.358)		
share of temporary workers (t-2)				-0.432***	
				(0.000)	
log (n. of permanent workers) (t-2)					-0.422***
					(0.000)
N	274	274	274	646	646
F	39.78	49.61	1.488	6.262	35.19

Notes: Heteroskedasticity robust s.e.
*** p<0.01, ** p<0.05, * p<0.1
The dependent variables are averages by country, sector, year and size (see Table 3.1 for definitions). Both sales and labour costs are specified in 1000 dollars (see the Appendix section 3.7.2). The countries in the sample are listed in Table 3.2

Table 3.31: **Dynamic labour demand estimation on the share of temporary workers in European countries - first stage**

	(1) log (labour costs)	(2) log (sales)	(3) n. temporay (t-1)	(4) share of temporary (t-1)	(5) log (n. permanent) (t-1)
labour regulations	0.222	0.176	6.643	-0.00250	0.125
	(0.389)	(0.535)	(0.187)	(0.732)	(0.056)
legal status	2.364***	2.196***	7.203*	-0.00482	0.664***
	(0.000)	(0.000)	(0.019)	(0.716)	(0.000)
log (labour costs) (t-1)	-0.950***	-0.191	-2.083	-0.00747	0.135**
	(0.000)	(0.431)	(0.580)	(0.335)	(0.003)
log (sales) (t-1)	0.412*	-0.425*	4.000	0.00743	-0.0154
	(0.026)	(0.024)	(0.352)	(0.372)	(0.670)
share of temporary workers (t-2)	2.734**	3.632**		-0.241**	
	(0.006)	(0.008)		(0.007)	
n. of temporary workers (t-2)			-0.0333		
			(0.358)		
log (n. of permanent workers) (t-2)					-0.422***
					(0.000)
N	274	274	274	274	646
F	37.76	41.51	1.488	2.003	35.19

Notes: Heteroskedasticity robust s.e.
*** p<0.01, ** p<0.05, * p<0.1
The dependent variables are averages by country, sector, year and size (see Table 3.1 for definitions). Both sales and labour costs are specified in 1000 dollars (see the Appendix section 3.7.2). The countries in the sample are listed in Table 3.2

Table 3.32: **Dynamic labour demand estimation on the number of permanent workers in non-European countries - first stage**

	(1) log (labour costs)	(2) log (sales)	(3) n. temporay (t-1)	(4) share of temporary (t-1)	(5) log (n. permanent) (t-1)
labour regulations	-0.222	-0.0456	-4.761	-0.0182	0.126
	(0.549)	(0.902)	(0.365)	(0.056)	(0.300)
legal status	2.603***	2.579***	52.86	0.0162	0.562***
	(0.000)	(0.000)	(0.108)	(0.120)	(0.000)
log (labour costs) (t-1)	-0.926***	-0.176	-0.110	-0.0107	0.124*
	(0.000)	(0.320)	(0.981)	(0.079)	(0.023)
log (sales) (t-1)	0.449*	-0.351*	4.562	0.0134*	-0.0543
	(0.012)	(0.047)	(0.286)	(0.031)	(0.182)
log (n. of permanent workers) (t-2)	-0.448	-0.542			-0.384**
	(0.275)	(0.183)			(0.004)
n. of temporary workers (t-2)			-0.0341		
			(0.430)		
share of temporary workers (t-2)				-0.542***	
				(0.000)	
N	372	372	372	372	372
F	19.09	35.77	0.772	15.02	15.50

Notes: Heteroskedasticity robust s.e.
*** p<0.01, ** p<0.05, * p<0.1
The dependent variables are averages by country, sector, year and size (see Table 3.1 for definitions). Both sales and labour costs are specified in 1000 dollars (see the Appendix section 3.7.2). The countries in the sample are listed in Table 3.2

Table 3.33: **Dynamic labour demand estimation on the number of temporary workers in non-European countries - first stage**

	(1) log (labour costs)	(2) log (sales)	(3) n. temporay (t-1)	(4) share of temporary (t-1)	(5) log (n. permanent) (t-1)
labour regulations	-0.250	-0.0741	-4.761	-0.00250	0.155*
	(0.497)	(0.843)	(0.365)	(0.732)	(0.019)
legal status	2.641***	2.642***	52.86	-0.00482	0.865***
	(0.000)	(0.000)	(0.108)	(0.716)	(0.000)
log (labour costs) (t-1)	-0.927***	-0.166	-0.110	-0.00747	0.162*
	(0.000)	(0.352)	(0.981)	(0.335)	(0.032)
log (sales) (t-1)	0.484**	-0.315	4.562	0.00743	0.0800
	(0.006)	(0.067)	(0.286)	(0.372)	(0.254)
n. of temporary workers (t-2)	0.0000264	-0.0000701**	-0.0341		
	(0.216)	(0.001)	(0.430)		
share of temporary workers (t-2)				-0.241**	
				(0.007)	
log (n. of permanent workers) (t-2)					-0.549***
					(0.000)
N	372	372	372	274	274
F	39.28	41.71	0.772	2.003	45.74

Notes: Heteroskedasticity robust s.e.
*** p<0.01, ** p<0.05, * p<0.1
The dependent variables are averages by country, sector, year and size (see Table 3.1 for definitions). Both sales and labour costs are specified in 1000 dollars (see the Appendix section 3.7.2). The countries in the sample are listed in Table 3.2

Table 3.34: **Dynamic labour demand estimation on the share of temporary workers in non-European countries - first stage**

	(1) log (labour costs)	(2) log (sales)	(3) n. temporay (t-1)	(4) share of temporary (t-1)	(5) log (n. permanent) (t-1)
labour regulations	-0.293	-0.122	-4.761	-0.0182	0.155*
	(0.418)	(0.741)	(0.365)	(0.056)	(0.019)
legal status	2.697***	2.682***	52.86	0.0162	0.865***
	(0.000)	(0.000)	(0.108)	(0.120)	(0.000)
log (labour costs) (t-1)	-0.899***	-0.149	-0.110	-0.0107	0.162*
	(0.000)	(0.392)	(0.981)	(0.079)	(0.032)
log (sales) (t-1)	0.473**	-0.319	4.562	0.0134*	0.0800
	(0.006)	(0.055)	(0.286)	(0.031)	(0.254)
share of temporary workers (t-2)	-3.537*	-3.497*		-0.542***	
	(0.029)	(0.045)		(0.000)	
n. of temporary workers (t-2)			-0.0341		
			(0.430)		
log (n. of permanent workers) (t-2)					-0.549***
					(0.000)
N	372	372	372	372	274
F	20.15	39.73	0.772	15.02	45.74

Notes: Heteroskedasticity robust s.e.
*** p<0.01, ** p<0.05, * p<0.1
The dependent variables are averages by country, sector, year and size (see Table 3.1 for definitions). Both sales and labour costs are specified in 1000 dollars (see the Appendix section 3.7.2). The countries in the sample are listed in Table 3.2

Conclusions

This thesis studies how diverse shocks could affect different forms of entrepreneurship differentially and hinder the process of economic development in developing/transition countries.

Entrepreneurship is a crucial driver of economic development and growth, both in developing and in industrialized economies. Violent conflict, conversely, is a clear obstacle to economic development and growth, particularly in countries ragged by several decades of conflict such as Afghanistan.

The first chapter of the thesis is based on a detailed and comprehensive dataset to carefully investigate the relation between conflict and PEA in the context of Afghanistan. Two unique sources of information are matched– with a detail of precision along many different dimension (type of economic activity, household background information, and type of conflict events) and a comprehensiveness which are extremely rare in a developing country. The dataset enabled us to assess how the households' choices with respect to the source of income are affected by the conflict intensity in the area in which they live. Here we focused on the choice to hold one type of private economic activity. The results show that the probability that a household engages in PEA is, in general, positively affected by the level of conflict. However, the results are heterogeneous with respect to the type of activity and the conflict indicator used.

Indeed, it is mainly less capital-intensive self employment activities – e.g. sales of prepared food and petty trade – and activities related to subsistence agriculture, which drive the positive relationship. More capital-intensive self employment activities requiring higher fixed capital investments – e.g. milling and taxi driving – are less positively affected by the intensity of the conflict. All in all, this study finds evidence that conflict pushes households towards marginal self employment activities and towards agriculture, and households do not gain from doing business with the foreign army. Thus, whereas the overall effect of conflict on the economy is likely to be negative, people tend to hold on their survival capabilities.

Are the findings supportive of directing international aids to entrepreneurship in conflict-ridden countries? Possibly, for two reasons. The results show that the

causal relation goes from conflict to entrepreneurship: it is resilient private economic activity – self employment – which is driven by intensity, and not private economic activity which attracts more conflict (at least at the scale of private economic activity that an Afghan households holds). Second, and more speculatively, if financed, some of the entrepreneurial activity may become a strong leverage for economic development as soon as a conflict reduces in a specific area, even though it continues in other areas of the country. People who are forced out from employment into self employment may become a source of future development. However, more importantly, the results do show that violent conflict, even when driven by a foreign coalition, rewinds the slow process of structural change of a low income country. If the conflict lasts long enough, such regression may require a long time before the country can change direction again.

The second chapter of the thesis is the first study that analyses how higher conflict intensity in a district affects both the extensive margin (participation to the labour force) and the intensive margin (n.of hours worked) of child labour in Afghanistan. Interestingly, the results suggest that children in conflict affected areas, especially young females, are more likely to join the labour force but work less non-domestic hours per week. In particular, the results show that a one unit increase in conflict intensity[8] has a positive impact on the extensive margin of child labour labour supply and that this increase is entirely driven by 6-12 years old female children (8% points). I also find an increase in adult labour supply which seems to be driven by female adults (8.3% points). The results of the analysis of the impact of higher conflict intensity in Afghan districts on the intensive margin response of children labour supply suggest that there is a decrease in non-domestic hours worked which is significant just for younger (6-12 years old) females (-0.5). I do not find any significant effect on domestic hours worked. The findings about the extensive margin are consistent with the stream of the literature that finds higher school drop outs of girls in conflict ridden states due to a gender-biased decrease in human capital investment in times of uncertainty, which partially explains why younger females join the labour force. The decrease in non-domestic hours worked per week instead, could be explained by both a decrease in highly child labour

[8] One conflict over 1000 individuals in the district.

based intensive economic activities such as agricultural ones or petty trade and an increase of insecurity that could keep children indoors decreasing the number of hours worked in a non-domestic environment. How could governments reduce child labour in developing conflict-ridden states given that child labour is mostly informal and thus regulations do not work? More research is necessary in order to disentangle the mechanisms that lead to an increase in child labour in conflict affected areas so that alternative policies to direct regulation can be suggested.

Finally, the last chapter of the thesis provided a cross-country comparison of the impact of the crisis on firm's labour demand can facilitate knowledge of "what works". According to the results of this analysis the impact of the financial crisis on the share of temporary workers between 2009 and 2012 in European countries was about 24% negative and significant. Their share didn't show instead any significant variation in European countries over the period of the crisis. No significant effect is found on the number of permanent workers.

Future research is necessary to better understand how conflict shifts the different categories of self-employment, building up a model of occupational choice. At the same time, future research is needed to better understand the mechanisms that can explain an increase in the number of young female children working and a decrease in the number of the number of non-domestic hours worked because of higher conflict intensity in Afghan districts. Finally, more research is needed in order to explain the reasons why the share of temporary workers significantly decreased in Non-European versus European firms.

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