Conflict and well-being of civilians: The case of the Russian-Ukrainian hybrid war

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A R T I C L E   I N F O

A B S T R A C T

This paper investigates the contemporaneous effect of conflict on civilians living outside of the conflict zone. Applying a multi-dimensional concept of well-being, it uses two large household surveys over 2012–2016 to analyze how the Russian-Ukrainian hybrid war affected the financial well-being and health of people in both countries. We find that the conflict significantly worsened financial well-being in both countries. The impact mostly operates by worsening expectations about financial well-being and is inversely related to the distance from the conflict zone. Our analysis indicates an increase in chronic diseases in Ukraine over a longer period. Mental health is negatively impacted in both countries at the earlier stages of the conflict. However, in Russia this effect is significant only in the region bordering the conflict zone, while in Ukraine it is significant in regions farther away from the conflict zone.

1. Introduction

The impact of military conflict on the well-being of a population has attracted the attention of scholars from different fields for a long time. Most of these studies have focused on the effects of conflict on the combatants and on the civil population within the conflict zone. However, even a highly localized conflict may have an impact on a much larger territory as a result of the migration of a displaced population, the destruction of communication and supply chains, and psychological warfare. Research into the effects of conflict on civilians outside the conflict zone, and the channels (direct and indirect) and intensity of these effects is becoming more important because of a significant increase in the exposure of civilians to conflicts.

Many scholars take the view that the impact of military conflicts on civilian populations has increased dramatically; for instance, at the beginning of the 20th century, 85–90% of casualties were military, whereas by the late 1990s 80–90% of all casualties were civilian (Collier, 2003; Kaldor, 2006). However, some argue that methodological differences in counting casualties and high levels of measurement error cast doubt on this apparently dramatic shift towards civilian casualties (Roberts, 2010). Still, it would be fair to say that the advent of powerful and technologically advanced weapons and the transmission of threats of violence through the mass media and social networks have significantly increased the levels of anxiety and fear among the general population affected by modern armed conflicts and negatively affected the overall well-being of civilians (Landau et al., 1998). As a result, military violence persistently affects the mental health of not just the civilians living inside the conflict zones (Cesur et al., 2013), but also of those who experience it through daily stressors such as changes in social and material conditions, the destruction of social networks and the mass displacement of the civilian population (Miller and Rasmussen, 2010).

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The sizable literature on the impact of military conflicts on macroeconomic outcomes provides mixed evidence concerning the negative short-run consequences of conflicts on economic growth, per capita income, exports and external debt (Collier, 1999; Stewart et al., 2001) and also on the positive effects on economic growth leadership, managerial and organizational skills that are seen in the aftermath of war (Koubi, 2005; Bellows and Miguel, 2009; Miguel and Roland, 2011; Coupé and Obrizan, 2016a). There is a growing body of literature that studies the microeconomics of conflicts (Verwimp et al., 2018) where the analysis of micro data gives evidence of a negative, *long-run* impact of armed conflicts on health, education and labor market outcomes of war veterans, the internally displaced population and others directly affected by military violence (Ghobarah et al., 2003; Blattman and Miguel, 2010; Kondylis, 2010; Miller and Rasmussen, 2010; Calderón-Mejía et al., 2015).

This paper estimates the *contemporaneous* impact of military violence on civilians' well-being, using micro-level individual survey data to study the case of the Russian-Ukrainian hybrid war. We use two large individual-level datasets, the Ukrainian Household Budget Survey (UHBS) and the Russian Longitudinal Monitoring Survey (RLMS), over a time period that covers the time before and during the conflict (2012–2016). Unlike Coupe and Obrizan (2016b), who looked at the conflict using data from the Kyiv International Institute of Sociology (KIIS), we chose UHBS for the analysis of Ukraine for several reasons. First, UHBS is the largest individual-level dataset for Ukraine, including around 7000–8000 observations per year (the data from KIIS includes only 2000 observations). Second, this data contains detailed information about the respondents' economic circumstances (household income and expenditure), health, and their subjective evaluation of their financial situation, thereby allowing us to analyse different domains of well-being. Third, the data is representative at the regional level, while the KIIS dataset is not.

Well-being reflects many aspects of peoples' lives, capturing a wide range of their experience and perceptions. Therefore, it can tell us more than the objective economic indicators alone (Stiglitz et al., 2009; Alkire and Foster, 2011; Diener et al., 2017). Previous attempts to evaluate the effect of military violence on civilians' well-being generated inconclusive and contradictory results. A cross-country study by Welsch (2008) found that armed conflicts, with their concomitant psychological effects and reductions in income, significantly decrease life satisfaction. Moreover, the number of victims, as well as the change in the numbers of victims over time, significantly affects the life satisfaction of the population even after the conflict has ended. Research into life satisfaction in post-war Bosnia and Herzegovina showed that personal satisfaction varies with the intensity of violence experienced. War-related trauma – loss of friends and relatives, damaged houses – had a negative, significant and lasting impact on life satisfaction (Shemyakina and Plagnol, 2013). At the same time, Van Praag et al. (2010) did not find any significant changes in life satisfaction and financial well-being before, during and after the military conflict between Israel and Hezbollah in 2006.

Unlike previous research that uses a single-item measure of well-being (whether it be life satisfaction, happiness or a quality of life evaluation), the measurement of well-being in this paper is multi-dimensional because it has been shown that peoples' overall life satisfaction is affected by many aspects, such as their health, employment or material resources (Kahneman and Krueger, 2006). To capture the whole picture, it is important to take into account objective conditions and subjective assessments across different dimensions (Stiglitz et al., 2009). Positive and negative changes in well-being, measured along different dimensions, may cancel each other out, leading to no change in the measurable index overall despite profound and deep problems associated with certain dimensions that require immediate policy interventions (Gosling et al., 2003). Using multi-dimensional measures raises questions concerning the choice and relative importance of the dimensions one should consider. This paper relies on Benjamin et al. (2014), who suggested using people's preferences, rather than 'fundamental aspects' of well-being in order to determine the most important well-being dimensions. We focus on two dimensions of well-being: health and financial well-being ("FWB"), which Russians and Ukrainians both mentioned in UHBS and RLMS as the most valued components of their overall well-being.

Another important contribution of this paper is its examination of conflict from both sides of the border: that of the country that initiated and supported the conflict, and the country where the conflict takes place. The conflict could affect the opposing sides in different ways since the losses for one country may translate into gains for the other. The World Happiness Report shows opposite trends in life evaluation for Russians and Ukrainians during the conflict. According to Helliwell et al. (2013, 2017), Ukraine lost 44 positions in the overall country happiness rankings (from 87th place in 2010–2012 to 132nd place in 2014–2016). At the same time, Russia jumped from 68th place to 49th during the same period, even though the conflict led to a deterioration in Russia's economic situation and broke the social ties between two close neighbors.

This paper also contributes to the literature on the effect of conflict on health. A substantial number of papers that investigate the implications of conflicts on health are focused on the *long-run* effects of a conflict (Alderman et al., 2006; Bundervoet et al., 2009; Bozzoli and Brück, 2010; Minoiu and Shemyakina, 2014). Our aim is to research the *contemporaneous* effects of military violence on the health of civilians. Military conflicts can impact the health of even those who do not experience violence directly, whether that be through the spread of communicable diseases during the course of forced migration flows (Toole and Waldman, 1997; Roberts, 2009) or the exacerbation of pre-existing diseases that went untreated because of the hostilities. Therefore, even localized conflicts may negatively influence the health of the population of a much wider area. It is important to analyse how fast and how wide the impact on health spreads.

Our identification strategy is based on the difference-in-difference methodology (DD) adjusted for the intensity of treatment, which is inversely related to distance from the conflict zone. The results of this research show that the conflict mostly affects the civilians in Ukraine and that the border dampens its effects considerably. Whilst for Russians the negative effect was seen only during the first year of the conflict, for Ukrainians it was present for all three years since 2014. The effect is inversely related to the distance from the conflict zone and mainly works through the deterioration in financial well-being. Our results show that the negative effect of the conflict on expectations about future financial well-being goes beyond the shock experienced by the individual's current income. Satisfaction with one's financial situation does not mirror the impact on income because people adjust their needs to their financial means. Negative financial expectations do, however, lead to real effects on the current macroeconomic situation through delayed

investment decisions, the devaluation of local currency, and increased distrust in the banking system (i.e. Diamond and Dybvig, 1983; Bloom et al., 2007; Baker et al., 2016).

The impact of the conflict on health gives a rather mixed and nuanced picture. Mental health is negatively impacted in both countries at the earlier stages of the conflict. However, in Russia this effect is significant only in the region that borders on the conflict zone, while in Ukraine it significantly affects those living farther away from the conflict zone. This may be related to the negative correlation between the proportion of ethnic Russians in the population and to the distance from Donbas – a high proportion of the population living close to the conflict region may have welcomed the secession of Crimea and the rising Russian influence, whereas people from the more remote regions were strongly against it.[1] Physical health deteriorated in the third year of the conflict in Ukraine only, with the effect stronger for those civilians living closer to the conflict zone. Perhaps this pattern indicates that the effect of the conflict on physical health occurs with longer lags, while mental health is impacted earlier and recovers more quickly, since people adjust to their changing environment.

The rest of the paper is structured as follows. Section 2 presents background information about the Russian-Ukrainian hybrid war. Section 3 discusses the empirical methodology. Section 4 describes the data used in our analysis. Section 5 presents the results, and Section 6 concludes.

Russia-Ukraine hybrid war: background on the conflict and its aggregate economic impact

At the end of March 2014, pro-Russian protesters occupied government buildings in the Southern and Eastern parts of Ukraine and called for political and economic autonomy.[2] The catalysts for these actions were the annexation of Crimea by Russia and the coordinated effort of a paramilitary group led by a Russian national, Igor Strelkov, who took control of Slavyansk, a town 100 km north of Donetsk.[3]

Later, in the summer of 2014, the Donetsk and Lugansk People's Republics were declared. The National Security and Defence Committee of Ukraine dubbed the self-proclaimed Donetsk and Lugansk People's Republics terrorist organisations and declared the start of an anti-terrorist operation (ATO) in Donbas.[4] Since 2014, ATO has transformed into a full-scale military conflict. According to the official data, from April 2014 to December 2016 almost 10,000 people were killed in the Eastern part of Ukraine and 22,779 were injured (Office of the United Nations High Commissioner for Human Rights (OHCHR, 2016), while 1.7 million people were displaced (International Displacement Monitoring Centre, IDMC). According to the Ministry of Defence, 50 % of industrial factories in the Donetsk region and 80 % in the Lugansk region are currently controlled by pro-Russian separatist forces.

Donbas, the industrial heartland of Ukraine, became devastated. Most enterprises were cut off from both their established supply chains and the world markets due to military fighting, damage to railway and electricity lines, and the new de facto border established between the occupied part of Donbas and the rest of Ukraine. Broken linkages and the sanctions imposed by the government against the separatists also negatively hit the Ukrainian economy. For instance, factories that were dependent on their supply of coal from Donbas had to shut down until they had found an alternative supplier (Adarov et al., 2015). This negative shock pushed the already sluggish Ukrainian economy to the brink of collapse. The local currency devalued against the USD by 50 % in 2014 and by another 37 % in 2015. GDP per capita dropped by 1.1 % in 2014 and by 9.5 % in 2015 (see Fig. 1).

The hybrid war by Russia against Ukraine was carried out through separatist proxies in the Donbas region. The rebel groups were supplied with weapons and ammunition via the Russian-Ukrainian border, which, since 2014, was controlled by the separatists. In response to the Russian intervention in Ukraine, a number of Western countries introduced several rounds of sanctions. Russia, in turn, responded with counter-sanctions, banning food products from the EU countries. Skyrocketing military expenses, the disintegration of economic ties with Ukraine, the high economic burden of the government's support for Crimea and the so-called Donetsk and Lugansk People's Republics, and the fall in oil prices all combined with the economic sanctions and counter-sanctions to bring growth in Russia into negative numbers for the first time since the financial crisis: −1 % in 2014 and −3 % in 2015. Additionally, the Russian rouble was devalued by almost 50 % and inflation increased to 15.5 % in 2015.

The existing literature on the Russian-Ukrainian hybrid war has estimated the impact of the conflict separately for Russia and Ukraine. Guriev and Melnikov (2016), who investigated the effect of the conflict in Eastern Ukraine on social capital in Russia, found that the conflict had a detrimental effect on social capital that was inversely related to the distance from the conflict zone. Coupe and Obrizan (2016b) looked at the conflict from the opposite side of the border. They examined the impact of the conflict on happiness in Ukraine and concluded that the average level of happiness declined only in the conflict zone, while happiness in the other regions did not change. This result was explained by (i) the lack of empathy of the European-oriented population in the Western regions towards the pro-Russian population in the Eastern regions, and (ii) by the prolonged duration of the conflict in that people simply adjusted to living with it.

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[1] We would like to thank our referees for highlighting this point.

[2] Pro-Russian forces organized protests in the Donetsk, Lugansk, Kharkiv, Odessa, Mykolaiv and Zaporizhia regions. However, they succeeded in overthrowing the local governments only in Donetsk and Lugansk.

[3] See, for example, "Russia's Igor Strelkov: I Am Responsible for War in Eastern Ukraine", Nov 21, 2014, by Anna Dolgov, Moscow Times

[4] Donbas (Donetsk and Lugansk regions) is an industrial region that plays an important role in the economy of Ukraine. Donbas is Ukraine's industrial heartland, the centre of its production of metal and coal and the machine-building industries. It accounts for 16% of the country's GDP and a quarter of its exports. 6.45 million people lived in the region before the conflict (Source: State Statistics Service of Ukraine).
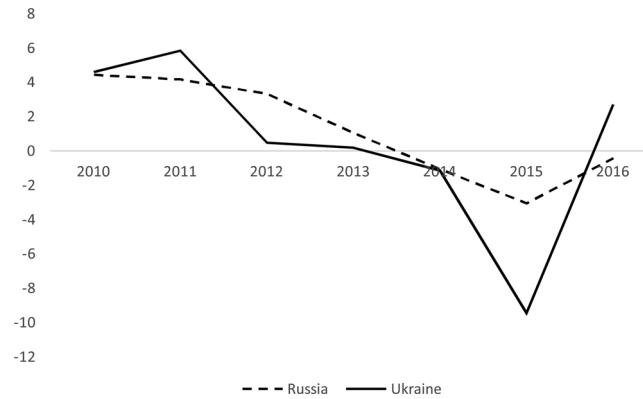
Fig. 1. Growth of GDP per capita in Russia and Ukraine in 2010-2016.
Source: World Development Indicators, World Bank. Annual percentage growth rate of GDP per capita is based on constant local currency. Aggregates are based on constant 2010 U.S. dollars. GDP per capita is gross domestic product divided by mid-year population.

2. Methodology

2.1. Identification strategy

To identify the effect of the conflict on well-being, we use the DD methodology, modified to account for the peculiarities of our data. For a valid inference, DD needs a balanced randomized sample with common trends for the control and treatment groups. Our data does not include the population of the temporarily occupied territories of the Donetsk and Lugansk regions and Crimea in 2014–2016. In particular, two of the largest cities of Donbas, Donetsk and Lugansk, are not covered by the 2014–2016 surveys. Moreover, the population of the non-occupied parts of the Donbas region out-migrated in large numbers to escape the conflict. The likelihood of migration varied by the differing levels of financial situation, age, gender, occupation and education. Therefore, "treatment" in the conflict zone was not random. These data deficiencies and the sample selection problem preclude us from using the standard methodology. To overcome this, we make two modifications to the DD analysis. First, using the distance from Donetsk (the capital of the self-declared People's Republic of Donetsk) to the main administrative capitals in Ukraine and Russia allows us to measure the intensity of the impact of military violence on populations from different regions.[5] It is reasonable to assume that the population that lives closer to the conflict zone will be affected more by the conflict than the residents in remoter regions. We interact distance with the timing of the conflict as the source of exogenous variation to study how people from different regions of Ukraine experienced the conflict. To exclude the endogeneity problem arising from the migration of the most mobile population to farther away from the conflict, we look at how the conflict influenced the components of well-being for population groups with varying levels of mobility. Second, as an alternative model specification, the population of Rostov in Russia[6] is selected as the treated group and the standard DD analysis is performed.

Another limitation of DD is the assumption of parallel trends for the treated and control groups. We test this assumption by looking at the trends prior to the conflict and testing whether they were different for the treated and control groups. We also perform a placebo test, in which distance to Minsk – the capital of Belarus – is taken to measure the intensity of the effect, thereby checking that our results are not driven by unobserved factors unrelated to the conflict.

2.2. Empirical model

The modified DD model is given by

$$D_{irt} = \beta_0 + \beta_1 Conflict_t + \beta_2 \ln(Dist\_Donetsk_r) + \beta_3 Conflict_t \times \ln(Dist\_Donetsk_r) + X_{it}\delta + \mu_R + \mu_t + \varepsilon_{it} \tag{1}$$

where D_{irt} is a Well-Being ("WB") domain of an individual i from region r at time t, captured by one of the measures of financial well-being or health that are described below. X_{it} is the set of individual-specific variables (age, education, occupation, etc.) for individual i at time t, $Conflict_t$ is a dummy for the conflict, which takes the value 1 if the year is 2014 or later, and 0 otherwise. $\ln(Distance\_Donetsk_r)$ is the distance from Donetsk to the main administrative city of region r. The coefficient β_3 is the main coefficient of interest, which shows whether increasing the distance from Donetsk reduces the impact of the conflict on WB. It is worth mentioning that there are some studies in the academic literature that also used the DD to measure the intensity of changes.

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[5] Apart from this justification in terms of data availability, the chosen approach may be reasonable in its own right. It is simply a continuous treatment assumption, which is quite common (see Rehdanz et al., 2015, in the context of the Fukushima disaster). We would like to thank a referee who pointed this out.

[6] Ukraine has a border with three Russian oblasts (provinces). However, RLMS has conducted surveys only in the Rostov region, which is located nearest to some heavy battles, and there was evidence of building-up the military presence of Russian army forces.

Acemoglu et al. (2004) used mobilisation rates in different states as the interaction term and estimated the effect of World War II on the female labour supply in the US. Akbulut-Yuksel (2014) used the degree of destruction of cities to measure the long-run impact of the Air Force's bombing during WWII on health and labour market outcomes. Guriev and Melnikov (2016) used the distance from Donetsk and Lugansk to measure the impact of the Russia-Ukraine hybrid war on social capital.

Apart from the conflict, there can be other factors that influence respondents' self-estimation of financial well-being ("FWB") and health. The economic situation in Ukraine started to deteriorate before the military conflict, as seen in the devaluation of the local currency, negative trends in the global markets for metals (the main export item of Ukraine), high energy prices, and the loss of trade links with Russia (Coupe and Obrizan, 2016b). It is clear that the Eastern regions, oriented towards trading with Russia, suffered more than the Western regions, which had closer trade relationships with Europe (Zhukov, 2016). Moreover, as shown in Fig. A1 in Appendix B, regions differ in their ethnic mix, which may affect personal well-being domains related to health. Likewise, the economic situation in Russia was severely impacted by the decline in oil prices in 2014–2016 and by a series of economic sanctions. These circumstances may affect the evaluation of the individual's FWB and are not direct consequences of the conflict, although the conflict worsened the situation.

Therefore, the macro-regional fixed effects (μ_R), which capture the strength of economic ties and other fixed regional characteristics, are included. Our macro-regions (R) in Russia and Ukraine are larger than oblasts and regions. In Ukraine, they include North, West, South and Bordering Donbas.[7] For Russia, we use the official division of the Russian regions by Federal Districts. Since the conflict has already lasted for several years, we also add time fixed effects (μ_t), to capture the common shocks that hit Ukraine and Russia each year. Finally, ε_{it} is the error term. Further, for the Russian sample we use Rostov (located very close to the conflict zone) as the treated group and run a standard DD model as given by

$$D_{irt} = \gamma_0 + \gamma_1 Conflict_t + \gamma_2 Rostov_r + \gamma_3 Conflict_t \times Rostov_r + X_{it}\pi + \psi_r + \psi_t + e_{it} \tag{2}$$

3. Data

We use the Ukrainian Household Budget Survey (UHBS) in 2012–2016, which comprises a repeated cross-section of micro data on Ukrainian households conducted by the State Statistics Office of Ukraine. UHBS reflects the composition of the population in Ukraine,[8] as well as the composition of the population in the regions. It contains information about individual characteristics (age, gender, education), economic circumstances (household income, expenditure), health, and a subjective evaluation of the financial situation.[9]

To assess the effect of the conflict on the population of the Russian Federation we employ the Russian Longitudinal Monitoring Survey (RLMS) from 2012 to 2016. RLMS is a series of nationally representative surveys, which contain detailed information about individuals' characteristics, health status and subjective evaluation of different aspects of life. Additionally, RLMS reports household-level expenditure and income. For this study, we consider only the European part of Russia, located closer to Ukraine. We suppose that the effect of the conflict on the Far East and Siberia is minimal and thus including those regions would add confusion to our analysis.[10]

The conflict started in March 2014. For both datasets, the 2014 rounds were conducted in the 4th quarter.[11] Our treatment period therefore starts with the 2014 surveys and continues with the 2015 and 2016 surveys. In our analysis, we focus on the sample of people who are 16 or older. The impact of conflict on the WB of children is a very important topic that requires different treatment to that of the adult population. We therefore leave it for future research.

3.1. Measuring financial well-being

To measure financial well-being, we use both objective and subjective aspects. Objective FWB is measured as the real total household income – the sum of all household income sources net of taxes and deflated by the consumer price index. To evaluate subjective FWB, we use two self-reported variables. The first variable is the "ability to make ends meet" ("AEM"), which is very commonly used to measure financial well-being (Angel et al., 2003; Arber et al., 2014). It takes a value of 1 if the person had enough income to buy food and 0 otherwise. RLMS does not contain questions that can be used to measure this ability to make ends meet. Thus, for the Russian sample we use a variable that measures "financial satisfaction", which is also used as an indicator of subjective financial well-being in other studies (i.e. Zimmerman, 1995). It takes a value of 1 if the person is satisfied and 0 otherwise. To

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[7] Ukrainian regions were split into macro regions, based on the military administrative division. Donbas includes the Donetsk and Lugansk regions; Bordering Donbas includes the Kharkiv, Dnipropetrovsk and Zaporizhzhja regions that border Donbas; South (Vinnitsa, Kropyvnitskiy, Odessa, Mykolaiv and Kherson regions); North (Chernigiv, Zhytomir, Sumi, Poltava, Cherkasy, Kyev); West (Volin, Zakarpatskiy, Ivano-Frankivskiy, Ternopilskiy, Lvivskiy, Rivne, Khemelnitskiy, Chernivetskiy).

[8] From 2014 this data does not include information about Crimea and the self-proclaimed Donetsk and Lugansk People's Republics.

[9] The survey that estimates the health of the population was not conducted in 2013. Therefore, data from 2012 and 2014-2016 are used for the analysis of health. Financial self-evaluation data are not available for 2012. As a result, for the estimation of financial well-being we use data for 2013-2016.

[10] We do not consider the panel dimension of the RLMS for our study, since it does not track people who moved houses. This deficiency of the RLMS precludes the use of individual fixed effects, because distance for the individuals in the sample does not vary over time.

[11] In RLMS, 200 individuals were surveyed in January 2014. We control for those individuals in our regression analysis.

evaluate how secure a person feels about their financial future, we use the self-reported "expectation about financial well-being" ("FWB"). It takes a value of 1 if the person expects improvements and 0 otherwise. More detailed information about these measures is presented in Table A1 in Appendix A.

We distinguish between subjective FWB and income, because income alone does not reflect the ability to meet one's needs (Zimmerman and Katon, 2005) and has a different dynamic to expectations about the financial situation (Angel et al., 2003; Joo and Grable, 2004). Current real income varies with short-term fluctuations in prices and economic activity. Expectations are more sensitive to the arrival of new information about the conflict (including the influence of fake news, information warfare, etc.) and may shape the investment decisions of individuals. This naturally has implications for policymakers.

3.2. Measuring health

Regarding health, we make a distinction between physical and mental health, because we expect the conflict's effect on them to be subject to different mechanisms, timing and duration. The effect on physical health may develop later, but with longer and more severe effects, leading to disabilities and chronic diseases (Alderman et al., 2006; Palmer et al., 2016). Conversely, the effect on mental health is more acute in the short run, but the longer the conflict continues, the more likely it is that people will adjust to their new situation (Shemyakina and Plagnol, 2013; Miller and Rasmussen, 2010).

Previous studies point out that the spread of communicable diseases arising from forced migration flows during conflict increases a number of chronic diseases and disabilities (Toole and Waldman, 1997; Roberts et al., 2017). As an indicator of changes in physical health, we use self-reports as to whether a person had a chronic disease within the previous 12 months.

To measure mental health, we employ self-reports about stress symptoms within the previous 12 months. Physical responses to stress can be reflected in a set of symptoms (anxiety, depression, insomnia, migraine, etc.; Farhood et al., 1993). The dependent variable for the basic model is constructed based on the responses to a set of questions concerning whether the person had any symptoms of stress. To avoid difficulties with correspondence and to have a reasonable share of cases, all questions that measure any symptoms of stress (namely, frequent headaches and migraine, depression and anxiety, and hypertension) are aggregated into one category – stress symptoms – as the simple average of the three components. More detailed definitions of the health variables are given in Table A1 in Appendix A.

3.3. Control variables

In line with the existing literature, a range of demographic and socio-economic variables is included as explanatory variables (gender, marital status, education, age and age squared, occupation, and income). We attempted to match the UHBS and RLMS variables as closely as possible. The full description and construction of the variables is presented in Table A1.

3.4. Preliminary analysis of the data

3.4.1. Financial well-being

Fig. 2 presents the dynamics of the components of WB in Russia and Ukraine in 2012–2016. While a comparison of Russia and Ukraine in terms of the absolute levels of these variables is not possible due to differences in the questions and methodologies used in the two surveys, an examination of the dynamics of the changes is very informative. In 2013–2016, all components of financial well-being deteriorated in both countries. In Ukraine, real income dropped by more than 30 %, while in Russia it declined by 10 %. At the same time, 2016 saw a slow recovery of household income in Ukraine, whereas in Russia the gradual decline continued, reflecting the effect of sanctions and a drop in oil prices that occurred in 2016. Satisfaction with current FWB and ability to make ends meet declined steadily in both countries. While not directly comparable, it is nevertheless instructive to look at the levels of the FWB variables in Russia and Ukraine. In 2013, around 62 % of the population in Ukraine and 90 % of the population in Russia had a positive evaluation of their current financial well-being (ability to make ends meet in Ukraine and satisfaction with current financial situation in Russia). In 2014 only 32 % of Ukrainians reported the ability to make ends meet, which contrasts starkly with the situation in Russia, where 83 % were able to make ends meet. It is also interesting to look at expectations about the future. This measure took a cliff edge dive in Ukraine in 2014 and slowly recovered in 2015–2016, while in Russia the decline was slow but took two years to recover even by a small amount in 2016.

3.4.2. Health

A preliminary inspection of health indicators in 2012–2016 (Fig. 2) shows an increase in the share of population with stress symptoms in both countries in 2014–2016. This was preceded by a reduction in stress symptoms from 2012 to 2013. The same pattern is observed for the proportion of people with chronic diseases, albeit that the pattern is significantly more pronounced in Ukraine. The proportion of the Ukrainian population with chronic diseases increased from 44 % in 2012 to 50 % in 2016, while there were only small changes in the proportion of chronic diseases in Russia.
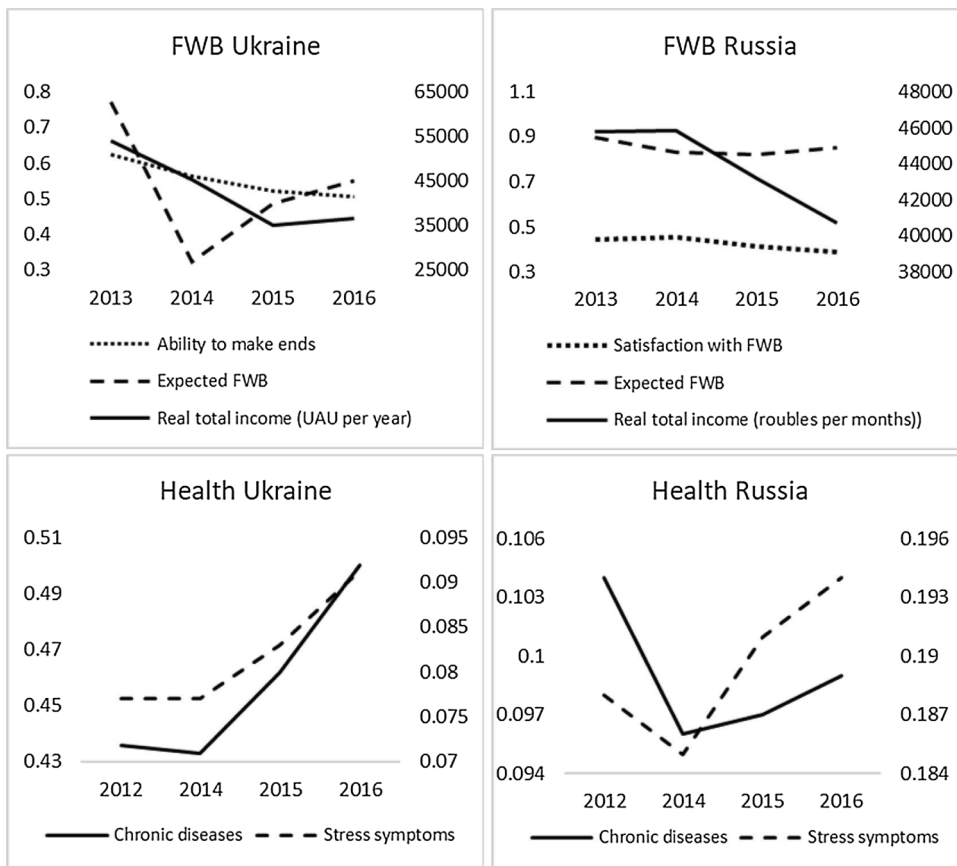
Fig. 2. Components of well-being in Russia and Ukraine in 2012–2016.

4. Results

4.1. Effects of the conflict on FWB and health in Ukraine

First, we estimate Eq. (1) for the Ukrainian sample that excludes the populations of Crimea and Donbas. Panel A of Table 1 reports the results for the components subjective FWB, real income and health (physical and mental).[12] The model is estimated by OLS with individual and household controls, and macro-regional and time fixed effects. Control variables include age, age squared, natural log of education, urban, divorced, widowed, married, family size, unemployed, retired, student, entrepreneur self-employed, and female. Robust standard errors clustered at the household level are reported in brackets.

Column (1) reports point estimates of the coefficients of the model, with ability to make ends meet ('AEM') as the dependent variable. Comparing AEM before and during the conflict shows that it substantially worsened for all populations in Ukraine. Since the conflict started, 25 percentage points more people did not have enough money to cover their living costs or buy food. This effect did not vary significantly with distance, meaning that the impact of the conflict on the ability to make ends meet comes from the overall macroeconomic situation and has low regional variation. However, this may also be due to the fact that prior to the conflict, regions closer to Donbas were relatively better off than other regions of Ukraine, as the negative coefficient of the natural log of distance from Donbas indicates.

It may be argued that the conflict mainly lowers the subjective components of FWB through the shock in real terms to the annual household income and that our results are affected by omitted variable bias. Column (2) reports the same regression using an additional control of the natural log of real annual household income. In this regression the impact of conflict on the whole population of Ukraine becomes insignificant. R-squared increases from 6.6–14.1 %. We conclude that the negative effect of the conflict on AEM is mostly channelled through the shock to the current income.

At the same time the effect of the conflict on expectations about FWB, reported in columns (3) and (4), is much stronger for the whole population; we note a 70 percentage points higher share of people reporting that they have negative expectations about their future financial situation. However, expectations improve for those who live farther from the conflict zone, as indicated by the

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[12] For the full set of results, please refer to Table A2 in Appendix A.

Table 1

Impact of conflict on components of WB and income in Ukraine and Russia.

	(1) Ability to make ends meet	(2) + real income	(3) Expected FWB	(4) + real income	(5) Ln real total income	(6) Stress Symptoms	(7) Chronic diseases
	A. Main results Ukraine						
Conflict	−.255***	−.044	−.705***	−.539***	−.591***	−.052***	.111**
	(.080)	(.077)	(.075)	(.075)	(.060)	(.015)	(.052)
Ln Distance	−.166***	−.189***	−.152***	−.148***	.067***	−.007**	.105***
	(.018)	(.017)	(.017)	(.017)	(.014)	(.003)	(.012)
Ln Distance x Conflict	.020	.006	.057***	.050***	.039***	.008***	−.010
	(.012)	(.012)	(.012)	(.012)	(.009)	(.002)	(.008)
Ln real total income		.357***		.052***		−.004***	.045***
		(.007)		(.007)		(.001)	(.005)
Regions	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	60715	60715	59394	59394	60715	60755	60755
R^2	.066	.141	.099	.127	.540	.374	.324

	Satisfaction with FWB	+ real income	Expected FWB	+ real income	Real income	Stress symptoms	Chronic diseases
	B. Main results Russia						
Conflict	−.031	−.014	−.206***	−.214**	.002	.027	.005
	(.086)	(.084)	(.067)	(.068)	(.110)	(.036)	(.022)
Ln Distance	−.022	−.066***	.103***	.099***	.182***	.012*	.031***
	(.016)	(.016)	(.012)	(.012)	(.020)	(.006)	(.004)
Ln Distance x Conflict	−.006	−.006	.023**	.025**	−.016	−.003	−.001
	(.012)	(.012)	(.009)	(.009)	(.016)	(.005)	(.003)
Ln real total income		.171***		.032***		−.009***	−.001
		(.005)		(.004)		(.002)	(.001)
Regions	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	45810	44060	45810	44060	44060	44060	44060
R^2	.041	.075	.044	.046	.431	.278	.122

$* p < 0.05, ** p < 0.01, *** p < 0.001$ Robust standard errors clustered at household level are in brackets.

All models include individual controls, and regional and year fixed effects. Control variables include age, age squared, natural log of education, urban, divorced, widowed, married, family size, unemployed, retired, student, entrepreneur, self-employed, female.

positive and significant coefficients of the interaction term between conflict and distance, with people who live 700 km away from Donetsk being 37 % more likely to evaluate their future financial well-being positively. In column (4) we control for real income, and this does not change our results. It indicates that the effect of expectations about the future is not fully explained by the level of current income.

Real total income (column 5) declined in all regions during the conflict since its start, but the decline was stronger in regions closer to Donbas. Real household income dropped by more than 60 % near the conflict zone, whereas 700 km away the decline in real household income was nearly halved – at only 33 %.

Columns (6) and (7) of the table present the results for the health indicators. We did not find a statistically significant effect of the conflict on chronic diseases across the whole period of the conflict. Indeed, rather surprisingly, stress symptoms declined during the conflict for the population as a whole, although the Ukrainian population living farther away from the conflict reported feeling more stressed. This may occur because the population of the Western regions of Ukraine took a more active part in the protest movement and had more negative attitudes towards Russian involvement in the conflict due to a lower proportion of ethnic Russians in the population. Additionally, there was a higher probability of being drafted to the military in Western Ukraine, which caused wide-spread protests by residents in the Western regions in 2014 and 2015.[13]

As for the other variables, we find that more educated people have a better evaluation of the components of FWB and better physical health (See Table A2 in Appendix A). A larger household size is associated with better subjective financial well-being. Retired individuals have lower FWB and poorer mental and physical health, while entrepreneurs report higher measures. While occupation may be an endogenous variable, for the period that is the subject of this study we assume that the shock of the military conflict was completely unexpected, so there is no reason to believe that people made those decisions taking into account the future conflict. Women evaluate their ability to make ends meet 2.4 percentage points poorer than men, and their expectations about their future FWB are 1.4 percentage points lower. Women also have a poorer evaluation of their health relative to men.

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[13] See http://ogo.ua/articles/view/2014-07-29/53533.html and http://ua.korrespondent.net/ukraine/politics/3472256-mobilizatsiia-za-kordon-yak-ukraintsi-tikauit-vid-armii.

4.2. Effect of the conflict on well-being in Russia

Second, we estimated Eq. (1) using RLMS data for the European part of Russia (Central, North-Western, Southern, Volga and Ural Federal Districts) in 2013–2016. Panel B of Table 1 presents the estimates of the coefficients of interest for FWB (objective and subjective) and health (physical and mental). All estimated regressions have similar controls as in Panel A, including individual characteristics, and regional and year fixed effects. Reported standard errors are robust and clustered at the household level.

FWB of the Russian population experienced a deterioration during the conflict, but not as severe as in Ukraine – there was a 20–21 percentage points reduction in expected FWB after the start of the conflict as opposed to 54–70 percentage points in Ukraine. Similar to the Ukrainian sample, the expected FWB of the population from regions closer to Donetsk experienced a larger and significant decline. However, we do not see the effect of the conflict on satisfaction with FWB or real income and health in Russia as coefficients for conflict, and the interaction of the conflict with distance is insignificant, as seen in columns (1), (2) and (5)-(7).

4.3. Conflict and well-being in the Rostov region

Due to Russia's large size and the denial of direct involvement in the conflict by the Russian government, it is not surprising that the impact of the conflict on the well-being of the Russian population is not very strong. However, the Rostov region in Russia borders on both the Donetsk and Lugansk regions. During the period of heavy fighting, it was reported that some villages in the Rostov region were hit by artillery shells and at least one person died.[14] Moreover, civilians in the Rostov region observed intensive movements of military troops and equipment. Finally, migration flows and cross-border human traffic between Russia and the Donetsk and Lugansk People's Republics significantly increased during the conflict. Therefore, it is reasonable to assume that the conflict had a stronger impact on the population in the Rostov region.

To test this hypothesis, we estimated the Eq. (2) specification using the population of the Rostov region as the treated group. The regression model includes individual controls, and regional and time fixed effects. Controls are age, age squared, natural log of education, urban, divorced, widowed, married, family size, unemployed, retired, student, entrepreneur self-employed, female. We also control for the natural log of real income when we evaluate subjective FWB and health.

The results are presented in Table 2. Since the conflict started, residents of Rostov were 16 % more likely to have negative expectations about FWB and 9 % more likely to be dissatisfied with their current FWB. The Rostov population also experienced an increase in stress symptoms by 2.4 %, but there was no significant effect on chronic diseases. Interestingly, during the conflict the population of Rostov experienced an increase in real total income of 7.2 % relative to the populations in other regions of Russia. This may reflect an increase in public spending, channelled to the region due to increased military spending, and improvements in the infrastructure necessary to host military troops and equipment that were concentrated at the border with Ukraine.

4.4. Dynamics of the impact of the conflict on FWB and health in Ukraine and Russia

The conflict in Ukraine went through several stages. It started at the beginning of 2014 as a low-scale military standoff. Then it escalated with a threat of full-scale Russian intervention and by the end of 2014/beginning of 2015, there was heavy fighting. The conflict continued through 2016 with low intensity fighting against the backdrop of the peace talks in Minsk. During this period, the economic situation in Ukraine had been worsening, seeing a slow recovery in 2016. Therefore, it is important to look at the dynamics of the changes in the components of well-being.

Table 3 presents the results. Panel A is based on the Ukrainian sample and Panel B is based on the Russian sample. We first look at the dynamics of whether civilians were able to make ends meet. According to column (1) of Panel A, in Ukraine there was, relative to 2013, an increase of 35 percentage points ("p.p.") in the number of people who had difficulties in making ends meet in 2014, with a farther 23 p.p. in 2015, and 4 p.p. in 2016. The interaction of the conflict with distance was positive and significant in 2014, becoming insignificant in 2015 and 2016. This pattern corresponds well with the overall economic situation in Ukraine. The ability to make ends meet was at its lowest in 2014, especially near the conflict zone, meaning people did not have the resources to satisfy their basic needs. By 2016 the situation had improved considerably. Regarding expected future FWB in column (2), expectations bottomed out in 2015, but in 2016 people still evaluated future FWB negatively.

We look at real income in column (3). Despite some improvements in the macroeconomic situation, real total household income failed to recover in the regions near the conflict zone (-57 % in 2015 relative to 2012, and -75 % in 2016), but there were signs of recovery farther away from the conflict, as indicated by a positive coefficient of the interaction term (0.037 in 2015 and 0.074 in 2016). This indicates that the negative economic effect of the conflict became more localized. By 2016 the situation with real income improved relative to 2014 in areas that were 300 km or more from the conflict zone.

The effect of distance from the conflict zone on mental health is seen to steadily weaken over time (column 4). The stress symptoms increased most strongly with distance in 2014, which was the period of the heaviest fighting and uncertainty. By 2016, when the phase of heavy fighting was over, their significant impact on the remote areas decreased. However, the situation with chronic diseases was the opposite (column 5). This measure did not significantly deteriorate until 2016. Moreover, the increase in chronic diseases was more pronounced in regions closer to the conflict zone. Perhaps this pattern indicates that the effect of the conflict on physical health occurs with long lags, while mental health is impacted earlier and recovers more quickly as people adjust

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[14] https://www.theguardian.com/world/2014/jul/13/ukrainian-shell-russian-border-town-donetsk.

Table 2
Conflict, FWB and health in Rostov.

	(1) Satisfaction FWB	(2) Expected FWB	(3) Ln real total income	(4) Stress symptoms	(5) Chronic diseases
Conflict	− .069***	− .038***	− .115***	.007**	− .006**
	(.008)	(.005)	(.010)	(.004)	(.002)
Rostov	.046	− .144***	− .339***	− .022*	− .028***
	(.040)	(.031)	(.041)	(.013)	(.008)
Rostov x Conflict	− .087**	− .160***	.072*	.024*	.012
	(.041)	(.038)	(.040)	(.013)	(.008)
Region	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes
Observations	45894	45894	44144	44144	44144
R2	.057	.078	.501	.292	.135

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$ Robust standard errors clustered at household level are in brackets.
All models include individual controls, regional and time fixed effects. Control variables include age, age squared, natural log of education, urban, divorced, widowed, married, family size, unemployed, retired, student, entrepreneur self-employed, female, natural log of income for components of subjective FWB and health.

to the changing environment.

Panel B of Table 3 presents the dynamic effect results estimated on the Russian sample. Unlike the baseline results in Table 1, the results presented here give a more nuanced and interesting picture of the impact of the conflict on the population of Russia. The first year of conflict (2014) saw a deterioration in all components of FWB, with significant negative results for both satisfaction with current income and expectations about future FWB. The expectations were also negative and significant in 2015, while the effect on financial satisfaction was short-lived and quite shallow. The effect of the conflict on subjective FWB in 2014 was significantly lower for people who lived farther from Donbas; however, this variation with distance disappeared in 2015 and 2016. Just as for the results in Panel B of Table 1, we did not find significant effects of the conflict on the health situation in Russia.

4.5. Well-being of sub-samples of the population

Populations with different levels of mobility at different stages of their life cycle may experience conflict differently. Table 4 reports the effect of the conflict on the financial well-being of different age groups. First, ability to make ends meet suffered most for the younger population, perhaps due to the higher volatility of income for groups without the buffer of state pensions. Relatively older people of working age were also hard hit. The expected FWB of all age groups dropped significantly during the conflict. The group age 26–45 was the least affected, perhaps due to their higher mobility and a greater flexibility to adjust to the negative effect of the conflict.

For the objective FWB, the conflict strongly influenced young and middle-aged people, with stronger effects being experienced closer to Donbas. The effect on the population aged 56 and older was less pronounced and did not depend on distance. This is likely related to the fact that work-related income is more volatile and more strongly influenced by proximity to the conflict, whereas state pensions are not contingent on geographical location and provide a measure of security against economic and political shocks.

The older generation experienced a stronger impact of the conflict on health, especially on chronic diseases for the $56 - 65$ year old, and on the mental health of people aged either 45–55 or older than 66 who lived far from the conflict zone. The effect on younger people was mostly not significant.

Table 5 reports the effect of the conflict on well-being by level of education and gender. The financial well-being of the population with only a primary level of education was largely not significantly affected by the conflict, while more educated people suffered losses, which significantly increased for the population living near the conflict zone. Interestingly, the group with secondary education was the most affected. Perhaps this is related to the fact that they have specialized skills that are not easily transferable to other places of work and other types of occupations, making this group less mobile than people with higher levels of education.

While the effect of the conflict on the ability to make ends meet is quite similar for males and females, females experience a stronger negative effect on expectations about the future, but those negative effects improve faster with distance from the conflict zone. At the same time, males experienced an increase in mental health problems, which were stronger for individuals who lived closer to the conflict zone.

4.6. Common trend test

For the DD methodology to provide a valid inference, we need to maintain the common trend assumption. For the regression model specification, as seen in column (3) of Table 3 with the natural log of real total household income in 2012–2016, we carried out a check for whether this assumption holds.[15] Our focus was on the behaviour of the variable $conflict_t \times ln(dist\_donetsk_r)$, where

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[15] We cannot test other financial and health variables in the Ukrainian sample because we do not have data for 2012-2013.

Table 3
Dynamics of FWB and its components in 2013–2016 in Ukraine and Russia.

	(1) Ability to make ends meet	(2) Expected FWB	(3) Ln real total income	(4) Stress Sympt.	(5) Chronic diseases
	A. Results for Ukraine				
Indicator for 2013			.040		
			(.069)		
Indicator for 2014	−.354***	−.675***	−.264***	−.065***	.017
	(.096)	(.091)	(.074)	(.018)	(.064)
Indicator for 2015	−.233**	−.852***	−.574***	−.051***	.096
	(.098)	(.095)	(.074)	(.019)	(.064)
Indicator for 2016	−.040	−.442***	−.749***	−.040**	.178***
	(.106)	(.103)	(.078)	(.020)	(.069)
Ln distance from Donetsk and 2013			.004 (.011)		
Ln distance from	.045***	.034**	.025**	.010***	−.002
Donetsk and 2014	(.015)	(.014)	(.011)	(.003)	(.010)
Ln distance from	.019	.087***	.037***	.008***	−.010
Donetsk and 2015	(.015)	(.015)	(.012)	(.003)	(.010)
Ln distance from	−.013	.033**	.074***	.006**	−.020*
Donetsk and 2016	(.016)	(.016)	(.012)	(.003)	(.011)
Regions	Yes	Yes	Yes	Yes	Yes
Observations	60715	59394	77464	60755	60755
R^2	.067	.126	.539	.374	.324

	(1) Satisfaction FWB	(2) Expected FWB	(3) Real income	(4) Stress symptoms
	B. Results for Russia			
Indicator for 2013	−.138	.069	−.241*	−.017
	(.102)	(.074)	(.144)	(.043)
Indicator for 2014	−.204*	−.342***	−.119	.031
	(.106)	(.092)	(.155)	(.044)
Indicator for 2015	−.103	−.183*	−.204	−.024
	(.105)	(.094)	(.150)	(.042)
Indicator for 2016	−.109	.037	−.233	.018
	(.101)	(.089)	(.148)	(.042)
Ln distance from	.017	−.011	.038*	.003
Donetsk and 2013	(.014)	(.010)	(.020)	(.006)
Ln distance from	.026*	.035***	.023	−.004
Donetsk and 2014	(.015)	(.013)	(.022)	(.006)
Ln distance from	.006	.014	.022	.005
Donetsk and 2015	(.015)	(.013)	(.021)	(.006)
Ln distance from	.003	−.013	.022	−.001
Donetsk and 2016	(.014)	(.012)	(.021)	(.006)
Region	Yes	Yes	Yes	Yes
Observations	59463	59463	57075	57075
R^2	.043	.046	.428	.274

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$ Robust standard errors clustered at family level are in brackets.
All models include individual controls and regional fixed effects. Control variables include age, age squared, natural log of education, urban, divorced, widow, married, family size, unemployed, retired, student, entrepreneur self-employed, female, natural log of income for components of subjective FWB and health.

$t = 2013, 2014, 2015, 2016$. We expected that the interaction term coefficient for $t = 2013$ would be insignificant, because the conflict only started in 2014. We also report our $conflict_t$ coefficients to show the annual trend in total household income in 2013–2016 relative to 2012.

The results in column (3) of Panel A in Table 3 show that real total household income declined in Ukraine during the conflict in 2014–2016, with no statistically significant differences between 2012 and 2013. More importantly, the coefficient of the interaction term is not significant for 2013, but turns positive and significant for 2014–2016. This indicates that before the conflict, regions that are more proximate to the Donbas region showed no difference in the total household income variable, but during the conflict their total household income deteriorated, more so than in the remoter regions.

For the Russian sample, presented in Panel B of Table 3, we can test for the common trend for all variables. We cannot reject the common trends for subjective FWB measures – satisfaction with FWB and expected FWB. We also cannot reject the common trend assumptions for the health indicators. At the same time, we reject the common trend hypothesis for real income. However, we are less concerned by this fact, given that we did not find that war impacted real incomes in Russia.

The results of the common trend test for the Rostov region versus the rest of Russia are presented in Table A3 in Appendix A. The results indicate that the Rostov region did not have a significantly different trend in FWB before the start of the conflict. However, the

Table 4

Components of financial well-being, conflict and age in Ukraine.

	(1) Age 16–25	(2) Age 26–35	(3) Age 36–45	(4) Age 46–55	(5) Age 56–65	(4) Age 66 and more
A. Ability to make ends meet						
Conflict	−.432**	−.310*	−.128	−.384***	−.041	−.198
	(.181)	(.163)	(.155)	(.148)	(.152)	(.147)
Ln Distance*Conflict	.052*	.032	.001	.042*	−.016	.005
	(.028)	(.025)	(.024)	(.023)	(.023)	(.023)
Observations	6643	9360	10123	10873	11012	10990
R^2	.044	.049	.058	.069	.081	.073
B. Expected FWB						
Conflict	−.611***	−.430***	−.507***	−.804***	−.505***	−.599***
	(.167)	(.152)	(.150)	(.136)	(.142)	(.143)
Ln Distance*Conflict	.065**	.036	.047**	.085***	.037*	.055**
	(.025)	(.023)	(.023)	(.021)	(.022)	(.022)
Observations	6472	9138	9857	10643	10808	10807
R^2	.137	.129	.115	.131	.139	.122
C. Ln Real total income						
Conflict	−.579***	−.659***	−.642***	−.716***	−.407***	−.457***
	(.145)	(.126)	(.122)	(.112)	(.105)	(.093)
Ln Distance*Conflict	.038*	.050***	.049***	.060***	.008	.019
	(.022)	(.019)	(.019)	(.017)	(.016)	(.014)
Observations	6643	9360	10123	10873	11012	10990
R^2	.490	.374	.424	.491	.593	.675
D. Chronic disease						
Conflict	−.059	−.047	.233*	.111	.337**	−.086
	(.111)	(.103)	(.129)	(.138)	(.134)	(.099)
Ln Distance*Conflict	.009	.010	−.032	−.008	−.039*	.024
	(.017)	(.016)	(.020)	(.021)	(.021)	(.015)
Observations	6682	9440	9982	11035	10899	10946
R^2	.058	.088	.072	.077	.053	.040
E. Stress symptoms						
Conflict	−.002	−.026	−.044*	−.083**	−.015	−.119**
	(.013)	(.018)	(.027)	(.035)	(.042)	(.049)
Ln Distance*Conflict	.000	.003	.006	.012**	.003	.019***
	(.002)	(.003)	(.004)	(.005)	(.006)	(.007)
Observations	6682	9440	9982	11035	10899	10946
R^2	.091	.141	.210	.291	.297	.209

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$ Robust standard errors clustered at family level are in brackets.

All models include individual controls, regional and time fixed effects. Control variables include age, age squared, natural log of education, urban, divorced, widowed, married, family size, unemployed, retired, student, entrepreneur self-employed, female, natural log of income for components of subjective FWB and health.

situation changed in 2014–2016, when the population in the region experienced a considerable deterioration in their expectations about future FWB, owing to the proximity of the region to the conflict zone.

4.7. Placebo test

We ran a placebo test to make sure that our identification strategy is sound. We measured the distance from the Ukrainian regions to Minsk, the capital of Belarus, which is located far from the conflict zone. There were no military actions near the Belarus-Ukrainian border. Moreover, the distance from Minsk to the Ukrainian regions is not collinear to the distance to Donetsk, being located at a higher latitude.

The results of the placebo test are presented in Table 6. Panel A presents the results for the Ukrainian sample. Most of the interaction terms are insignificant, indicating that since the start of the conflict, the well-being and health of Ukrainians were not related to their distance from Minsk. However, the interaction term of distance from Minsk and conflict has a negative and significant effect on expected FWB, indicating that after the start of the conflict there is a different dynamic of expected FWB between the northern and southern parts of Ukraine. For the Russian sample, the results of the placebo test are presented in Panel B of Table 6. We found no significant effects for all measures, thereby indicating that the results are not driven by some unobserved factors.

5. Conclusion

This paper investigated the contemporaneous effect of armed conflict from both sides, namely the country that encourages and supports the conflict and the country where it takes place. Unlike Coupe and Obrizan (2016b), we found that the conflict influenced the well-being of the population outside of the conflict zone, with the impact being felt not only in Ukraine, but also in bordering

Table 5
Well-being, conflict, gender and education in Ukraine.

	Education			Gender	
	(1) High	(2) Secondary	(3) Primary	(4) Female	(5) Male
A. Ability to make ends meet					
Conflict	−.254**	−.250**	−.151	−.231**	−.285**
	(.102)	(.102)	(.353)	(.107)	(.119)
Ln Distance*Conflict	.018	.020	.000	.015	.025
	(.016)	(.016)	(.053)	(.017)	(.018)
Observations	26743	32282	1690	31078	28314
R^2	.067	.059	.066	.171	.151
B. Expected FS					
Conflict	−.457***	−.665***	−.242	−.653***	−.481***
	(.098)	(.094)	(.347)	(.103)	(.109)
Ln Distance*Conflict	.034**	.068***	.004	.064***	.040**
	(.015)	(.014)	(.052)	(.016)	(.017)
Observations	26144	31610	1640	31080	28314
R^2	.130	.127	.114	.126	.129
C. Ln real total income					
Conflict	−.581***	−.549***	−.900***	−.522***	−.680***
	(.078)	(.077)	(.218)	(.080)	(.089)
Ln Distance*Conflict	.034***	.035***	.090***	.030**	.050***
	(.012)	(.012)	(.033)	(.012)	(.013)
Observations	26743	32282	1690	31719	28996
R^2	.505	.564	.710	.582	.455
D. Chronic disease					
Conflict	−.006	.208***	.080	.126*	.103
	(.076)	(.070)	(.243)	(.070)	(.079)
Ln Distance*Conflict	.006	−.022**	−.000	−.012	−.008
	(.012)	(.011)	(.037)	(.011)	(.012)
Observations	26686	32381	1688	31406	29349
R^2	.302	.332	.081	.359	.282
E. Stress symptoms					
Conflict	.002	.008	−.061	−.013	.020*
	(.012)	(.012)	(.062)	(.013)	(.011)
Ln Distance*Conflict	−.000	−.001	.010	.002	−.003*
	(.002)	(.002)	(.009)	(.002)	(.002)
Observations	26686	32381	1688	31406	29349
R^2	.009	.012	.049	.012	.010

* $p <$ 0.10, ** $p <$ 0.05, *** $p <$ 0.01 Robust standard errors clustered at family level are in brackets.
All models include regional and time fixed effects. Primary education is less than 9 years of schooling. Secondary education is from 9 to 11 year and high education is above of 11 years. Control variables include age, age squared, natural log of education, urban, divorced, widowed, married, family size, unemployed, retired, student, entrepreneur self-employed, female, natural log of income for components of subjective FWB and health.

regions of Russia. We noted two opposing partial effects: (i) a decrease in financial well-being with distance; and (ii) an increase in mental stress with distance, which may have cancelled each other out in the measurement of overall happiness that was recorded by Coupe and Obrizan (2016b). The difference could also be related to the fact that we use a regionally representative survey for Ukraine, while Coupe and Obrizan rely on the nationally representative sample.

We found that the conflict negatively affects the domains of well-being mainly through a deterioration in the expectations about future financial well-being. The strength and duration of the effect in the two countries differs. In Russia, it mostly disappeared after the first year of the conflict, when a full-scale conflict between Russia and Ukraine was viewed as a possibility, while in Ukraine it remained significant during the whole period. The intensity was inversely related to distance from the conflict zone.

Our results suggest that the negative effect of the conflict on financial well-being goes beyond the shock to the current income since people adjust their needs to their financial means. This is consistent with previous research (Solberg et al., 2002). The ability of Ukrainians to make ends meet was at its worst in 2014, when the objective measure of FWB had only started to decline. In 2016, when the real household income was still at its minimum, we observed that people evaluated AEM more positively relative to 2014.

The impact of the conflict on health shows a rather mixed picture. We did not find that the conflict affected physical health in Russia, while in Ukraine, the conflict affected chronic diseases only in the last year of our sample. The effect of the conflict on mental health in Ukraine was more significant farther away from the conflict zone, while in Russia we found an increase in stress symptoms near the Ukrainian border only in the Rostov region. This suggests that the effect on mental health does not necessarily vary with distance but may change with a difference in exposure to mass media and social networks, or with cultural differences (i.e. language) or ethnic groups.

Based on our results, we can offer several policy implications. First, the effect of the conflict on expectations is very strong and persistent. Therefore, the management of expectations and a reduction in uncertainty through timely, transparent and trustworthy

Table 6
Placebo test.

	A. Placebo test. Ukraine						
	(1) Ability to make ends meet	(2) + real income	(3) Expected FWB	(4) + real income	(5) Ln real total income	(6) Stress Sympt	(7) Chronic diseases
Ln Distance from Minsk x Conflict	.003 (.024)	− .006 (.023)	− .087***(.022)	− .089*** (.023)	.012 (.016)	− .009 (.005)	.025 (.017)
Regions	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	60715	60715	59394	59394	60715	60755	60755
R^2	.069	.142	.127	.129	.538	.136	.401

	B. Placebo test. Russia						
	(1) Satisfaction with FWB	(2) + real income	(3) Expected FWB	(4) + real income	(5) Real income	(6) Stress symptoms	(7) Chronic diseases
Ln Distance from Minsk x Conflict	.009 (.011)	.085 (.080)	− .012 (.009)	− .014 (.009)	.009 (.017)	.004 (.005)	− .001 (.003)
Region	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	45810	44060	45810	44060	44060	44060	44060
R^2	.482	.473	.361	.362	.542	.241	.145

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$ Robust standard errors clustered at family level are in brackets.
All models include individual controls, regional and time fixed effects, control variables such as age, age2, female, entrepreneur, retired, un-employed, married, divorced, widow, urban, level of education, size of family.

information should be a government priority during a conflict. Second, the delayed negative response of the population's physical health to the conflict highlights that the government should develop a programme of preventive actions, which would help to tackle these problems early on and prevent the long-run effect of conflict on health.

Acknowledgement

Appendix A

Table A1
Dependent and independent variables.

Variable	Measure	Value	Source
A. Financial well-being **Current FS:**			
Ability to make ends meet	How do you evaluate the level of your income during this year?	1 was enough/could buy enough food; 0 otherwise	UHBS
Financial satisfaction	How satisfied are you with your economic conditions at the present time?	1 if satisfied 0 otherwise	RLMS
Future FS:			
Expectation	How do you think will your financial situation change in the next 12 month?	1 if not get worse or much worse 0 otherwise	UHBS
	Do you think that in the next 12 months you and your family will live better than today or worse?		RLMS
B. Health **Chronic diseases:**			
	Do you have any chronic diseases (more than 6 month)?	1 if yes and 0 otherwise	UHBS
	Do you have any kind of chronic illness?		RLMS

Table A1 (*continued*)

Variable	Measure	Value	Source
Stress symptoms:			
• Depression or anxiety	Did you feel depression or anxiety (during the last 12 month)?	1 if yes and 0 otherwise	UHBS
	In the last 12 months have you had a serious nervous disorder or depression?		RLMS
• Headache and migraine	Did you feel frequent headache and migraine (during the last 12 month)?		UHBS
• Hypertension	Did you have hypertension (during the last 12 month)?		UHBS/RLMS
C. Treatment group variables			
Ln (Dist_Donetsk)	Natural log of kilometres from Donetsk to 24 administrative capitals, measured by driving distance		Google Maps
Bordering Donbas	Population from the regions bordering Donetsk and Lugansk oblast	1 if person lives in such region and 0 otherwise	Google Maps
Rostov	Population from the Rostov		
Conflict	Dummy for the years of the conflict	1 if year is greater of equal to 2014 and 0 otherwise	
Ln (Real total income)	Natural log of total household income adjusted for inflation	Annual, UAH of 2012	UHBS
		Monthly, Roubles of 2012	RLMS

Table A2
Financial well-being and conflict in Donbas – Baseline results.

	(2) Ability to make ends meet	(4) Future FS	(5) Ln real total income	(6) Stress Sympt	(7) Chronic diseases
Conflict	−.255***	−.591***	−.052***	.111**	
	(.080)	(.075)	(.060)	(.015)	(.052)
Ln Distance x	.020	.057***	.039***	.008***	−.010
Conflict	(.012)	(.012)	(.009)	(.002)	(.008)
Ln Distance	−.166***	−.152***	.067***	−.007**	.105***
	(.018)	(.017)	(.014)	(.003)	(.012)
Age/10	−.013	−.032***	.023***	−.003	.149***
	(.008)	(.008)	(.007)	(.002)	(.006)
Age^2/100	.003***	.003***	.001**	.001***	−.005***
	(.001)	(.001)	(.001)	(.000)	(.001)
Ln Education	.183***	.035***	.264***	.003	−.032***
	(.010)	(.009)	(.008)	(.003)	(.007)
Urban	−.047***	−.054***	−.025***	.000	.035***
	(.006)	(.006)	(.005)	(.001)	(.004)
Divorced	−.052***	−.007	−.194***	.003	−.030***
	(.010)	(.010)	(.009)	(.002)	(.009)
Widow/	−.029***	.014	−.207***	.027***	−.012
widower	(.011)	(.011)	(.009)	(.003)	(.008)
Married	.033***	.024***	.019**	.002	−.056***
	(.009)	(.009)	(.008)	(.002)	(.006)
HH size	.029***	.005*	.211***	.000	−.020***
	(.003)	(.003)	(.002)	(.000)	(.002)
Unemployed	−.138***	−.023***	−.209***	−.005***	−.006
	(.008)	(.008)	(.007)	(.001)	(.006)
Retired	−.134***	−.050***	−.173***	.013***	.252***
	(.007)	(.007)	(.006)	(.002)	(.007)
Student	.025**	.042***	−.060***	.006***	.015*
	(.012)	(.012)	(.010)	(.001)	(.008)
Entrepreneur	.200***	.046	.264***	−.001	−.081***
	(.021)	(.029)	(.032)	(.005)	(.023)
Self-	−.094***	−.012	.035***	−.006**	.025**
employed	(.014)	(.014)	(.012)	(.003)	(.012)
Female	−.024***	−.014**	−.053***	.006***	.022***
	(.006)	(.006)	(.005)	(.001)	(.004)
Log of real				−.004***	.045***
total income				(.001)	(.005)
Chronic				.145***	
Disease				(.001)	
Regions	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes
Observations	60715	59394	60715	60755	60755
R^2	.066	.099	.540	.374	.324

Table A3
Dynamic of FWB and stress symptoms in Rostov region during the conflict.

	(2) Satisfaction FS	(4) Expected FS	(5) Ln Real total income	(6) Stress symptoms
Indicator for 2013	−.016**	−.011**	.036***	.003
	(.007)	(.005)	(.010)	(.003)
Indicator for 2014	−.016**	−.088***	.042***	.005
	(.008)	(.006)	(.011)	(.004)
Indicator for 2015	−.062***	−.080***	−.052***	.009***
	(.008)	(.005)	(.011)	(.004)
Indicator for 2016	−.086***	−.051***	−.080***	.009***
	(.007)	(.005)	(.011)	(.004)
Rostov x 2013	.031	.038	−.031	−.015
	(.051)	(.045)	(.064)	(.016)
Rostov x 2014	−.082	−.099*	.032	.008
	(.053)	(.053)	(.073)	(.015)
Rostov x 2015	−.048	−.194***	.038	−.008
	(.053)	(.053)	(.065)	(.015)
Rostov x 2016	−.024	−.065	.058	.024
	(.049)	(.052)	(.064)	(.016)
Rostov	.014	−.179***	−.317***	−.015
	(.040)	(.034)	(.058)	(.013)
Regions	Yes	Yes	Yes	Yes
Observations	59547	59547	57159	57159
R^2	.063	.082	.498	.288

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$ Robust standard errors clustered at the family level are in brackets.
All models include individual controls, regional and time fixed effects. Controls variables include age, age squared, natural log of education, urban, divorced, widow, married, family size, unemployed, retired, student, entrepreneur self-employed, female, natural log of income for components of subjective FWB and health.

Appendix B. Distance to Donbas and pro-Russian support

Fig. A1 plots the proportion of ethnic Russians (Ukrainian 2001 census data) against the distance to Donbas as well as presenting a quadratic polynomial fit as a solid line. There is a strong negative correlation between the distance to Donbas and the share of ethnic Russians in the regions of Ukraine. It explains why there was more support to the Donbas rebels in Eastern Ukraine relative to Central and Western Ukraine. It also hints at the possibility that the impact of military conflict on mental health may be stronger further away from the conflict zone, because support for the Donbas rebels is likely to be linked to ethnicity.
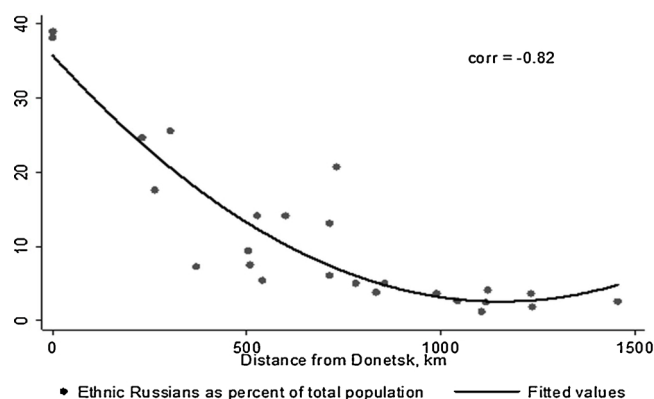

Fig. A1. Percentage of ethnic Russians and distance from Donbas.
Source: Data on percent of ethnic Russians within a region are from the 2001 census. The distances of the Donetsk and Lugansk regions to the conflict zone are set equal to zero. The distances to the other regions are measured by distances of administrative capitals from Donetsk. The fitted line is the second order polynomial regression of the percentage on distance. The correlation between the distance to Donetsk and the share of ethnic Russians is presented.

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