

## Investments in the development of human capital in the conditions of war: Experience in the context of improving the public administration system

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**Abstract:** The article represents socio-political, economic, and historical research of the landscape of war conflicts' consequences for human capital development. Both evident, statistically described and well-researched and latent, not evident and not 'surface' consequences are analyzed. Cases of Syria, Iraq, and Ukraine are considered based on dialectics and systemic-structural approach, in the plane of dynamics of human capital and efforts of these states in maintenance and development of human capital during war conflicts.

**Keywords:** *Educational expenses, Educational system, Human capital development, Investments, Public administration system, Violent conflict' consequences, Wartime.*

### 1. Introduction

War is a complex phenomena with far-reaching consequences for human resource development and economic stability. Understanding its theoretical roots is critical for developing effective methods to reduce its harmful effects and promote long-term peace and prosperity.

Armed conflicts would very likely diminish human capital due to worker skill losses during the war. In comparison to learning losses, the degradation of adult skills will have a far more immediate impact on the work force's human capital pool and productivity.

Modern academics seek to demonstrate the link between war and development by looking into the consequences of violent conflict on educational attainment and library market production. They assess the less visible but long-term cost of violence, as the majority of past emphasis has been focused on the immediate implications for individuals with acute humanitarian needs (Bi, 2023).

War has a significant and long-term microeconomic impact on civilian populations. People living in conflict zones may not only get injuries and have their property damaged, but they may also be displaced from their homes, lose their means of life, or be unable to attend school, all of which may result in a permanent decrease in their productivity and wages. Furthermore, because war expenses disproportionately affect the weakest and most vulnerable communities, fighting may exacerbate poverty and inequality. Deterioration of labor force skills, loss in motivation, weakening or even

destruction of social mobility mechanisms, and restriction of talent management programs are not obvious 'on the surface' but highly harmful consequences of conflict for human capital development.

Understanding whether economic impacts of violence are more severe or long-lasting is critical for efficiently conducting post-conflict reconstruction efforts. However, as experience shows, even during wartime it is possible to start and rather successfully implement some efforts of public administration system, which would allow preserving and developing human capital, in particular through effective investment. This, meanwhile, requires transparency and agility of public administration system, that is, in most cases, its improvement.

## 2. Literature Review

The consequences of war for human resource development are far-reaching and diverse. Human resource development begins with access to education, which can range from basic school to advanced technical and higher education. Interstate wars severely interrupt this process, causing the devastation of economic, social, and technical infrastructures (Collier et al. 2004). The implications are severe: loss of life, internal displacement, and the struggle for talented persons from war-torn areas (Hameed et al., 2023). Children are frequently the most susceptible victims, having their education interrupted or denied outright (Justino and Verwimp, 2013). This reduction in educational possibilities not only impedes current progress but also impairs nations' long-term growth potential (Anyanwu, 2002). Despite the damage, wars have been known to stimulate industrial innovation and economic prosperity in specific circumstances. Technical innovation and infrastructure development can be stimulated by the need for speedy production of goods and services for the war effort (Grossman and Helpman, 1994). Even if there are serious problems with equity and governance, reconstruction efforts in post-conflict settings usually lead to growth in the manufacturing, construction, and service sectors (Lis, 2018). Moreover, different perspectives on the duration and extent of war's effects on human capital are offered by economic theories. A pillar of economic philosophy, neoclassical growth theory maintains that economies are endowed with internal mechanisms for recuperation and reverting to long-term growth trajectories (Solow, 1956). In this approach, wartime human capital loss is viewed as a transitory setback, with economies responding by investment in education and technology (Surya et al., 2021). Various models, however, indicate that the process of recovering from the loss of human capital brought on by conflict may be arduous and protracted. Human capital rehabilitation may be hampered by institutional instability, social unrest, and long-term conflict dynamics (Shemyakina 2011). According to Collier and Hoefer (1998), countries caught up in violent and unstable cycles may find themselves 'imprisoned' in low-level equilibria, where the depletion of human capital feeds further conflict.

Hameed et al. (2024) use asymmetric causality analysis and non-linear autoregressive distributed lags (NARDL) to examine how war affects the development of human resources in Afghanistan. The results of the NARDL bound test show that the long-term connection between predictors is imbalanced (Zilinska et al., 2022). It shows that the per capita cost of war, the rate of child mortality, and the pace of population increase all have different short- and long-term effects on school enrollment rates (Vinichuk et al., 2023). Additionally, it shows that although negative shocks have the opposite effect over the short and medium terms, positive shocks from per capita GDP and per capita government education expenditures increase school attendance. This shows that school enrollment reacts swiftly and is very sensitive to changes in the per capita cost of war (Kryshtanovych et al., 2022). Moreover, the results indicate that the positive and negative aspects of the per capita GDP, per capita cost of war, per capita government expenditure on education, and population growth all significantly affect the positive and negative aspects of the school enrollment rate (Kussainov et al., 2023). The negative part of the child death rate and the school enrollment rate, however, are merely causally related. The implications for policy are investigated in light of these findings. The authors contend that measures should be taken to bring brain drain and the human capital war down to reasonable proportions (Arivazhagan et al., 2023). To promote school continuity, incentive-based techniques can be used, with a focus on teachers and instructors. Schools are key institutions for developing future human capital, which is critical for post-

conflict reconstruction efforts (Avedyan et al., 2023). The government should prioritize the supply of consistent and adequate safeguarding tools and equipment to schools throughout the conflict, as well as offer necessary financial assistance afterward to preserve their long-term viability (Gavkalova et al., 2022). Government agencies, social activists, and the media all play vital roles in promoting the family as a symbol of dedication, strength, and pride. The authors believe that this will greatly increase school attendance rates, creating a favorable climate for human resource development (Gupta et al., 2021). Although these recommendations were formulated for Afghanistan context, they can be included into the basis of designing more universal, as well as customized country-specific recommendations on the investment in human capital development during wartime, within the efforts of public administration system.

### 3. Methods

The process of writing the article was guided by the basic provisions of the scientific theory of knowledge, principles and methods of conducting socio-political, economic, and historical research, the main ones of which are objectivity, comprehensiveness, concreteness, historicism, scientific character and evidence of the proposed provisions, assessments, and conclusions (Kalyayev et al., 2019). General scientific methods were also widely used, such as systemic, analytical, problematic and logical approaches, abstraction and generalization, problem-chronological presentation of the material. Case-study method represented one of the bases for research.

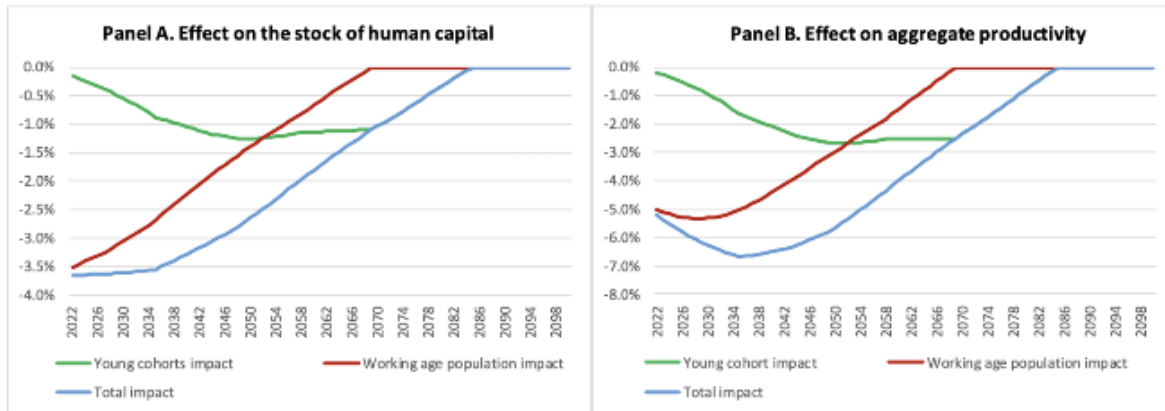
The need for systematization, analysis, and interpretation of the information base under consideration determines the combination of the general theoretical principles of scientific knowledge (dialectics of social development), approaches (systemic-complex, systemic-structural, systemic-functional with an integrating role of systemic-historical one), theoretical concepts and research methods.

### 4. Results

Egert and de la Maisonneuve (2023), who are researching the impact of the conflict on human capital and productivity in Ukraine, argue that assessing the loss of Ukrainian human capital necessitates knowledge of the war's influence on learning outcomes and adult skills (Kovaliv et al., 2023). The authors correctly claim that, while this data is currently scarce for Ukraine, a small existing literature provides estimates on the impact of war on human capital formation in other contexts, namely that armed conflicts have a strong negative effect on student learning outcomes as measured by test scores (Kondur et al. 2024). This is commonly thought to be the result of deteriorating school infrastructure, a shift to military spending at the expense of education funding, lower educational investment by households as income and wealth levels fall, and the psychological impact of conflict on children (Bruck et al., 2019, Ortiz-Correa, 2014, Jurges et al., 2022). For example, the Israeli-Palestinian war is believed to have reduced student test results by up to one standard deviation when compared to kids who were not influenced by the conflict. Similarly, researchers in Colombia found a detrimental influence on student test scores of up to 0.75 standard deviations for conflict-affected youngsters. The impact is greater for young children impacted by the war at birth than for those affected by the conflict in the year they were tested (Ortiz-Correa 2014).

Egert and de la Maisonneuve (2023) evaluate the impact of the war on learning outcomes and adult skills in Ukraine, stating that Simulation results 4 suggest that the overall macroeconomic effect is sizeable, dominated first by the immediate negative impact on the adult population, but then prolonged over time through the adverse effects on the student population, gradually entering the labor force in the future (Litvinova et al., 2020). For Ukraine, human capital losses are expected to peak between now and 2035 at roughly 3.6% (0.9% due to learning losses and 2.7% owing to worker skill losses). The effect will endure approximately 35 years and lessen until the last afflicted group quits from the labor market at the age of 65 in 2085 (Fig. 1, panel A). The war's influence on productivity is analyzed using regressions that relate human capital to total factor productivity (TFP) while adjusting for other

drivers. Accordingly, human capital losses are expected to diminish productivity by 6.7% at its peak in 2035 (Figure 1, panel B).



**Figure 1.** The adverse effect of a two-year war on human capital and productivity in Ukraine (Egert and de la Maisonneuve, 2023)

Despite these forecasts, however, one should mention that the conditions for development of human capital in frontline and rear regions of the country are significantly different, and averaging is harmful, since it hides the real 'picture' (Ortina et al., 2023). In rear territories of Ukraine, conditions for human capital development cannot be considered directly unfavorable, while in the frontline regions humanitarian and social situation is hard (Ostapenko et al., 2023). Thus, in our opinion, analysis should be made separately according to this territorial division, and policies/programs should be developed accordingly differently.

## 5. Discussion

One of the key lessons from the experience of post-World War II growth in European countries and Japan, for example, is that the rapid growth impact of the massive re-building of physical capital was made possible not only by the Marshall Plan resources, but also by the relatively limited depreciation of the human capital base during the war. This conclusion is made in Devadas et al.'s (2019) Policy Research Paper within World Bank Group research, which is devoted to growth after war in Syria. The authors suggest that, considering that about two thirds of the population is either internally displaced or residing as refugees abroad, human capital restoration should be given top priority in Syria's post-conflict economic rebuilding strategy (Popovych et al., 2023). And this should be done in addition to the reconstruction of physical capital, which will undoubtedly be a crucial component of the agenda. Other factors, such as institutions and market efficiency, must also be considered when calculating TFP.

According to UN population data (United Nations 2017), Syria's population has decreased from 21 million in 2010 to 18.3 million in 2018, with an average annual growth rate of -1.7% between 2011 and 2018. According to UN figures, the working-age population share has seen a negative annual growth rate of -0.09% from 2011 to 2018. The forecasts depict developments during the fight (Gaman et al., 2022). Between mid-2010 and mid-2020, anticipated mortality increased to 1,036,445 from 657,131 in the preceding decade, with a greater proportion of male deaths (68% vs. 32% for women). According to Abrams (2021), net migration overseas increased from mid-2010 to mid-2020, reaching 5,397,896.

Human capital in wartime Syria was impacted by (i) the disruption of schooling for the younger population, who represent prospective labor force entrants; and (ii) migration and fatalities, which change the distribution of years of schooling among the surviving population/existing labor force.

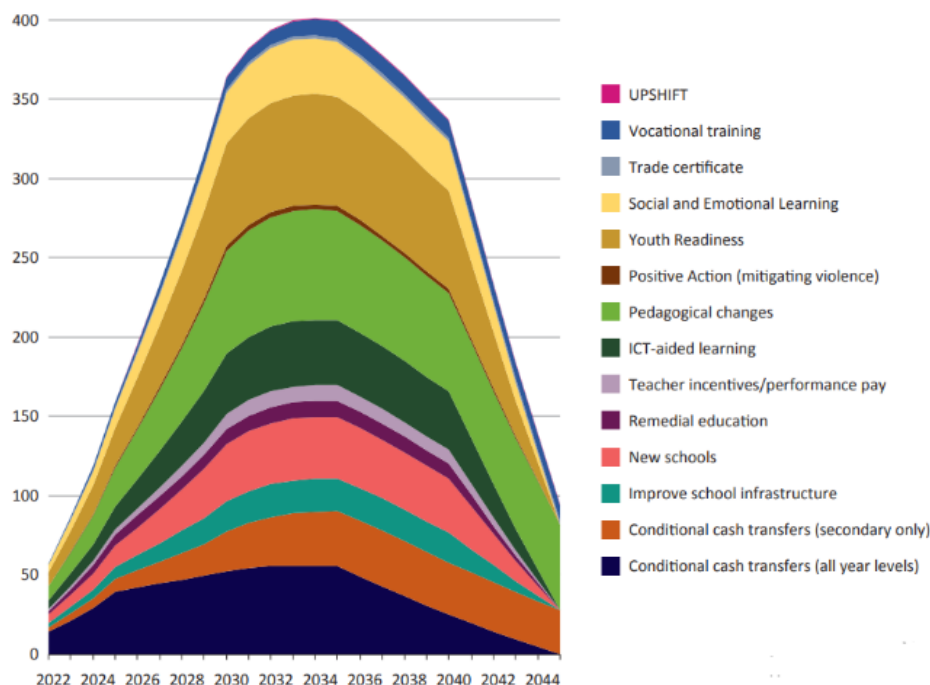
According to a World Bank report (2020), preliminary analysis shows that the combined effects of casualties, forced dispersion, and reduced investments in human capital formation could result in a 30% permanent loss in the country's human capital stock (compared to the 2010 stock).

However, significant attempts were undertaken shortly after the severity of hostilities was reduced (Skovronska et al., 2023). The accepted and executed model contains a series of interventions (intervention package) that influence a variety of educational variables, such as enrollment, promotion, repetition, dropout, and learning rates (Vorobei et al., 2021). The treatments have an effect on the number of school enrollments and withdrawals over time, which varied by gender, age, and grade level. The model then produces outputs such as the highest grade earned by school leavers, the average learning level, and the educational attainment levels of demographic cohorts of 15-19 and 20-24-year-olds up to 2050, for both males and females (Zalyubovskii et al., 2024). The education or learning quality indicator rises over time as different interventions are implemented, but the pupil-teacher ratio falls. Several studies have revealed that the effectiveness of interventions is influenced by a variety of education risk variables such as poverty, gender, rural or urban location, and early marriage (de la Pena 2020).

Furthermore, non-formal education programs that provide education and skill training to increase youth performance in industry, the service sector, and agriculture are particularly applicable to this project in Syria (Tsymboliuk et al., 2023). Improving ICT training to encourage involvement in these industries is also critical for young skill development.

Non-formal education programs, such as trade credentials, vocational training, and UPSHIFT, are thought to be relevant to Syrian conditions. Trade certifications and vocational training programs can address challenges relevant to employment (Zayats et al., 2024). Many out-of-school youngsters claim that the major reason they do not attend school is that education is ineffective and does not lead to employment prospects (Yermachenko et al., 2023). This issue can be addressed by trade certification and vocational training that is relevant to the work. The UPSHIFT program involves both social innovation and social entrepreneurship. Its goal is to enable young people to discover and address community concerns through entrepreneurial solutions. UPSHIFT strives to develop transferable skills and generate chances for the most disadvantaged young people, with a major goal of addressing youth employment (de la Pena, 2020).

As seen in Fig. 2, intervention costs grow to around \$360 million in 2030 and peak at over \$400 million in 2035, following which the cost of the initiatives begins to fall (Gupta et al., 2024). The Youth Readiness Initiative, SEL, and pedagogical enhancements are three of the most expensive components, costing around \$160 million in 2030. Each is highly labor-intensive and hence expensive, but they are significant in addressing, in different ways, students' psychological concerns and their chances of remaining in school (Isaieva et al., 2020). The cost of school construction and infrastructure reaches over \$60 million in 2035. By 2040, most program expenditures begin to drop. The entire cost of the inventions exceeds the baseline expenses by \$1,905 million from 2022 to 2030 and \$6,355 million from 2022 to 2050 (*Syria education and development investment case, 2022*).



**Figure 2.**  
Modelled formal and non-formal intervention costs in total and by intervention, US\$ million  
(*Syria education and development investment case, 2022*)

Table 1 displays the benefit-cost ratios (BCRs) for implementing the previously described educational programs. The three instances have various, mostly macroeconomic assumptions (Klymenko et al., 2016). For example, the preferred scenario assumed a 4% annual GDP growth rate, but the high and low cases assumed 5% and 3%, respectively. These calculations also show that these BCRs vary significantly over time.

**Table 1.**  
Benefit-cost ratios for three scenarios from 2030 to 2050, results (*Syria education and development investment case, 2022*).

Parameter	Preferred case	High case	Low case
<b>Results</b>			
Benefit-cost ratios (Discount rates)			
> To 2030 (@ 3% pa)	2.5	4.2	1.7
> To 2040 (@ 5% pa)	14.5	21.4	13.7
> To 2050 (@ 7% pa)	42.2	49.9	34.2

These are, by any standard, high BCRs, indicating that these high-return investments may be sustained even with significant downward revisions to the assumptions, as shown in the low scenario (Bazaluk et al., 2023). The trend of BCRs over time demonstrates that these are long-term efforts with a significant influence on Syrian society.

Targeted cash transfer programs for the most vulnerable households, including the development of a solid database to be used for all Government-led social assistance programs, the implementation of a social insurance law, and social protection microfinance programs for income generation and job creation aimed at the most disadvantaged groups, including women and youth (Al-Azmeh, 2024).

In the education sector, as one of the “five pillars of recovery” (*Iraq Reconstruction and Investment, 2018*), measures include increasing the capacity of the local community, teaching force, and central



administration to deliver and implement comprehensive quality education services in an equitable manner (Byrkovych et al., 2023). It is also planned to conduct sector assessments to analyze requirements and progress in order to improve the ongoing development of foundations that support quality education (Panasiuk et al., 2021). There is a strong emphasis on student learning outcomes, teacher performance, and curriculum development.

For comparison, Ukraine decreased requirements for entering higher educational institutions, as well as eased graduation test for schools (Deyneha et al., 2016). In attempt to attract more applicants for higher education and applying unified standards for the territories near frontline and safe rear, the public administration system does not contribute to development of human capital, but, on the contrary, implement rather destructive policy vectors.

However, corruption has long been a drain on resources and money in Iraq, reducing the positive impact of government expenditure on human capital (Khomiuk et al., 2020). According to a World Bank assessment, widespread corruption affects the structure of governmental expenditure, favoring defense, fuel and energy, culture, and public services and order at the expense of social sectors such as education, health, and social protection (Mishchuk et al., 2020). Rent-seeking diverts skills away from entrepreneurship and innovation and towards unscrupulous activities that generate income. As a result, resources are diverted from growth-promoting activities (human capital investments) and into power-seeking activities (political capital investments) (Cherniaiev et al., 2024). Iraq is among the lowest performers in Transparency International's Corruption Perceptions Index (168 out of 180 nations). Iraq is also one of the least financially transparent countries in the MENA region, scoring 3 out of 100 on the Open Budget Index (World Bank Group, 2020).

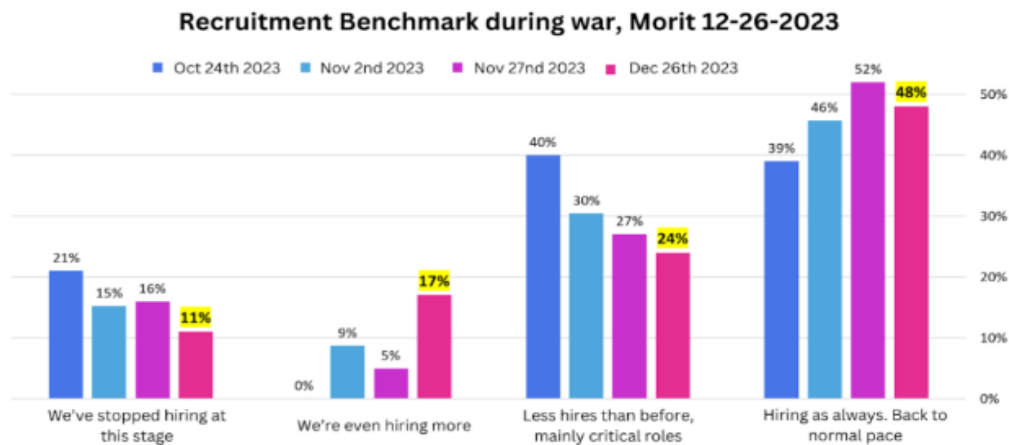
Ukraine presently ranks 104th out of 180 nations, which is clearly better than Iraq in 2020 but still insufficient for making truly successful investments in human capital development (Gaievska et al., 2023). Anchal Vohra, a columnist for Foreign Policy's online edition, stated in a recent article that Ukraine's strategy of defeating Russia by joining the West's political community and security institutions has been undermined by its ongoing struggles with corruption, which is still far beyond Western standards (Saik et al., 2023). The problem stretches to the heart of the Ukrainian state. Top judges, lawmakers, and bureaucrats have faced corruption allegations, and the Ministry of Defense has been at the center of several scandals (Vohra, 2024).

The World Bank underlines the need of generating budgetary headroom for human development investment in Iraq. An efficient public finance management system is essential for increasing the quality of human capital and public-service outcomes (Nekhai et al., 2024). Transparency in budget execution, openness in the procurement process, and cash management efficiency all play essential roles in a country's physical and human capital building while also reducing chances for rent seeking (Panasiuk et al., 2020). Last but not least, increased openness and accountability in project management, monitoring, and assessment are required to increase incentives to complete projects on time and under budget, as well as to assure value for money and integrity in the use of public resources (Shamne et al., 2019). A medium-term budget with a budget rule, supported by fiscal discipline, ensures that expenditure pressures do not exceed the resource envelope, ensures allocative efficiency that maximizes societal welfare in expenditure distribution, and introduces technical efficiency that ensures the least-cost delivery of public services.

Yonatan Shertzer (2024) views the function of human resources during wartime to be an important and underexplored issue. The author presents the example of a Hamas attack on Israel. He claims that functions of HR departments during times of war include the following: eliminating ambiguity and uncertainty; providing managers with the tools they need to deal with such circumstances; maintaining resilience and high morale; overseeing volunteer programs; maintaining contact with the reserve forces; providing support to war-affected families; carrying out an effective workforce reduction without jeopardizing the company's ability to continue operations; and managing work (Zharovska et al., 2023). Human resources departments are primarily responsible for maintaining adequate organizational infrastructures during emergencies (Vardarlier, 2016). This includes organizational processes that these

persons are directly responsible for. These procedures include employee status information, termination of employment, employee recruiting, employee mental health, disaster preparation training, and providing managers with the skills they need to deal with a wide range of difficulties that they are not used to face.

Morit Rozen (2024), like the aforementioned author, considers the instance of Hamas' war against Israel and says that for the first month following the bombings and the commencement of the war, most Israeli enterprises halted their employment operations (Shavarskyi et al., 2022). Even factories that supported the war ceased employing. The author indicated that this was mostly due to a lack of knowledge about what would happen next. However, some firms eventually resumed recruiting – and in large numbers. This is evident in the data gathered from hiring teams in over 65 firms across all industries (with around 35% in high technology) over the first 80 days of the conflict. Currently, around 89% of the enterprises in Israel are employing, most of them as previously, or even more so (Rozen, 2024) (see Figure 3).



**Figure 3.** Recruitment benchmark during Israeli-Hamas war, the respondents' answers to the question "Are you currently hiring?" (Rozen, 2024).

Thus, at the corporate level, it is also possible to make efforts for development of human capital and invest in this development. Naturally, synergetic combining of public administration system' and business' efforts in the investment in human capital development can bring sound results in preserving and even improving social capital during wartime.

## 6. Conclusions

One fundamental method via which violent conflict may have an impact on long-term development outcomes is the accumulation of human capital, which is a key factor in economic growth and development. Conflict and instability can have long-term, harmful consequences. After the guns fall quiet, violence leaves a legacy of damaged human capital that will reduce productivity, hinder growth, and impede poverty reduction in the long run.

Given the long-term human capital costs of missed education, it is critical to underline the relevance of micro-level mechanisms relating conflicts and long-term development outcomes, namely the level and access to education of civilian and combatant populations. There is a strong need to invest in young people in order to unlock their economic value at the individual, employer, and community levels, and in this regard, the efforts and resources of the public administration system and the business sector should combine, or, more accurately, become convergent in relation to one another, under conditions of transparency and accountability in government processes. Although it may appear to be primarily



relevant to rear areas, frontline regions may also undertake optimum human capital management in order to prevent a decline in its quality.

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