

ORIGINAL ARTICLE

# The unequal effect of economic development on perceived labor market risks and welfare

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## Abstract

Economic development and accompanying structural changes of the economy create new opportunities, however not everywhere and not for everyone. Development increases the demand for skilled labor, improving their welfare perceptions, but low-skilled workers feel more insecure and worse off economically. This adverse effect results from a mismatch between local labor demand and individual skill sets. To measure the development levels of people's local environments, I combine geocoded Afrobarometer data and night lights. Bayesian multilevel analysis confirms that the highly skilled are economically most dissatisfied in lagging areas, while the low-skilled are less satisfied in highly developed environments. These findings emphasize the importance of local conditions for welfare perceptions and show the unequal effect of development leaving behind large parts of the population.

**Keywords:** comparative political economy; comparative politics: developing countries; political economy

## 1. Motivation

When economies develop, their structure changes fundamentally and so do the opportunities people have on the labor market (Kuznets, 1973). Economic development and the accompanying structural transformation of the economy are often promoted to improve the living standard of the population. However, a positive impact of economic development on people hinges on two preconditions: first, *everyone* can benefit from the opportunities that growing economies offer them through employment and wages. And second, economic development not only improves objective measures, such as average income, but also the *perceived welfare* of people. To understand how economic development affects people we should therefore not only assess its objective impact for everyone, which has been questioned given rising levels of inequality (Ravallion, 2016; Alvaredo *et al.*, 2018), but also focus on its effect on citizens' welfare perceptions.

This paper, therefore, analyzes the effect of economic development on individual welfare perceptions, arguing that we need to focus on *local* development and economic structures, given that economic growth is a spatially uneven process (Kanbur and Venables, 2005). It builds on the link between economic development, the structural transformation of the economy, and the accompanying shift in the relative demand for skilled labor. I argue that individual welfare perceptions depend on the (mis)match of skills and labor market demand, which is determined by the local development level. Assessing the subjective effects of development is not only important to judge the success of development strategies, but it can help us understand the economic conditions that give rise to welfare (dis)satisfaction underpinning political attitudes (Healy *et al.*, 2017; Tilley *et al.*, 2018), behavior, and conflict (Gurr, 1970; Bernburg, 2015; Grasso and Giugni, 2016).

Research has documented how the changing structure of the economy and especially the rise of the knowledge economy in advanced industrialized countries affects political preferences and behavior, electoral politics, and government strategies (Powell and Snellman, 2004; Häusermann *et al.*, 2020). Structural changes of the economy and the labor market also accompany economic development in less-developed countries. While a number of studies document the connection between economic development and the distribution of income in society (Dollar *et al.*, 2016), or the link to happiness with life (Easterlin *et al.*, 2010), we know less about how economic development affects economic welfare perceptions, potentially powerful drivers of political demands and behavior.

The majority of studies analyzing the effects of development and structural transformation of the economy have so far overlooked the large variation in economic development within countries (Burgess and Venables, 2004). Growth and economic development cluster and are often confined to urban and coastal areas (Porter, 2000; Venables, 2005). Regions within countries are very differently developed and individuals within the same country are exposed to disparate economic conditions (Kanbur and Venables, 2005). Taking spatial disparities into account is especially important in developing and emerging countries as the variation in economic conditions is much more pronounced compared to advanced economies (Kim, 2008). And even in less divided, developed countries, a burgeoning literature shows the importance of accounting for local economic conditions when assessing political outcomes (Johnston and Pattie, 2001; Reeves and Gimpel, 2012; Healy and Lenz, 2017; Larsen *et al.*, 2019).

Therefore, this paper focuses on *local* development levels and labor market demand in people's communities. At low development levels, the economy is characterized by small-scale agriculture and non-competitive manufacturing, predominantly requiring low-skilled labor input (Cypher and Dietz, 2009). With higher economic development, the structure of the economy changes, manufacturing, and services become more important and the demand for labor shifts to more skilled workers. The increased demand for skilled labor should also result in a more pronounced wage gap between high- and low-skilled labor (Powell and Snellman, 2004).

In less-developed environments we would thus expect to find a mismatch of relative demand for the labor and skills of the well-educated workforce. Here, it is much more difficult to generate the same income compared to highly skilled individuals in thriving areas, where skilled labor is in greater demand. The economic outlook of this group should be higher the more developed the area they live in. For people with low-educational attainments this mismatch occurs in more-developed economic environments. While more educated people can benefit, the demand and especially the wages for less skilled workers do not increase proportionately. Their perceived welfare should decline the higher the local development level. Living in thriving areas, with larger wage gaps, should increase the feeling of being left-behind with low-skilled workers.

The empirical analysis draws on geocoded survey data in combination with night light data, a reliable and fine-grained proxy for economic activity (Weidmann and Schutte, 2017). It allows to measure the precise economic conditions around respondents' sites of residence. The results show, as expected, that only highly skilled people benefit from thriving economic environments—they feel economically secure and satisfied. In contrast, employment insecurity and lower perceptions of economic welfare hit low-skilled workers when the structure of the economy changes in more-developed areas.

Overall, the results presented here show the uneven effects of *local* economic development on individuals and how certain groups in society feel left behind when the economy thrives. They also warrant additional scrutiny when assessing the relationship between the economy and political phenomena such as political stability, turnout (Lehoucq and Wall, 2004; Stockemer, 2015), protest (Bussmann and Schneider, 2007; Robertson and Teitelbaum, 2011), or civil war (Buhaug *et al.*, 2011). When the link between economy and politics relies on individual level effects of economic development, trade, or investment we need to account for potentially diverse effects and how these might change our assumptions about the aggregate relationship. My findings should

caution us against simply linking national economic conditions to individual attitudes without accounting for the conditions people experience directly. Tracing the specific economic conditions people are directly exposed to and the patterns of perceived individual welfare can then serve as a solid basis for understanding political demands and behavior.

## 2. The distributive effects of economic development

My argument suggests that economic development affects economic welfare perceptions through the structural transformation of the economy and the accompanying change in labor market dynamics. Welfare perceptions are dependent on the match of labor market demands and individual skills: when people participate in labor markets that value and reward their skill set, they rate their welfare higher than when they live in areas where the labor market demand differs from the skills they possess. In essence, it is the relative demand for skilled labor in local labor markets that affects perceptions of economic welfare. This emphasizes the importance of local economic conditions rather than more distant, aggregate economic conditions. I first describe how economic development and structural transformation go together and how they affect the relative demand for skilled labor. In a second step, I lay out how the welfare perceptions of individuals are affected by labor market dynamics that result from different development stages.

### 2.1 Economic development, structural transformation, and demand for labor

In general, economic activities comprise the production and transaction of goods and services. When the economic activity of countries grows, this process coincides with the structural transformation of the economy, meaning the reallocation of economic activity away from agriculture to manufacturing and services (Chenery, 1960; Kuznets, 1973). The shift away from agriculture is accompanied by the introduction of new technologies and international integration, the facilitation of technology transfer, foreign direct investment, and international trade (Goldberg and Pavcnik, 2007; McMillan *et al.*, 2014). The level of economic development is thus directly linked to the stage of structural transformation of the economy.

At low levels of development, agriculture is often the dominant sector with the largest employment share. However, it also tends to be a comparably low productive sector and income from agriculture remains small (Restuccia *et al.*, 2008; Gollin *et al.*, 2014). Earning opportunities do not require extensive skill sets and the agricultural sector does not reward or employ highly skilled workers. Skills acquired through education are an essential determinant for the productivity of workers. In other words, different levels of education convey different skill levels and indicate worker productivity (Jones, 2001; Spitz-Oener, 2006). Economies at low development levels largely require less productive, low-skilled workers; these are workers without significant educational achievements. Dominated by agriculture and non-competitive manufacturing, these economies generally provide unfavorable environments for generating income and securing economic welfare. Educated individuals, in particular, are likely to find it hard to receive adequate returns on their labor given the lack of demanding, high-skilled jobs.

With rising levels of development, the agricultural employment share decreases and the ratio of workers in the manufacturing and service sector increases (Herrendorf *et al.*, 2014). The expansion of the manufacturing and service sector depends on technological innovations, which changes the demand for labor and its allocation across the three broad sectors (Lee and Wolpin, 2006). Both manufacturing and services are more technology intensive compared to agriculture and require more skilled labor input. In addition, productive sectors and firms are more prevalent at higher levels of development. They replace less productive and unprofitable firms that are not fit to compete, especially when markets open up to international competition (Melitz, 2003; Helpman *et al.*, 2010). Overall, the output of the economy grows, technology advances, and more goods and services with higher value are produced and traded.

The production of these goods and services requires highly skilled workers. Thus, the demand for labor shifts toward more skilled workers, who are on average more educated (Topel, 1999; Krueger and Lindahl, 2001).

## **2.2 Labor market demand, perceived risks, and welfare**

Economic development affects labor market dynamics and the relative demand for skilled labor. I argue that people's economic welfare perceptions are dependent on the fit of their individual skills and the local demand for labor. When individual skill levels match the type of labor that is relatively more demanded, people should feel less at risk and satisfied with their economic situation. A relative mismatch indicates inadequate or comparably low returns to labor and adverse results in comparison to others in the local labor market. This is important as research shows that social comparison, performed consciously or unconsciously, plays a vital role for perceptions of welfare (Wolbring *et al.*, 2013; Reyes-Garcia *et al.*, 2016). While people can compare their welfare to different benchmarks (Festinger, 1954), and it is not possible to clearly identify these reference point(s), we know that comparison to others plays a central role in the assessment of income (Clark and Senik, 2010). Therefore, discrepancies between own skill level and local demand for labor should adversely affect individuals' views of their labor market risks and welfare.

As pointed out, the economic opportunities in less developed environments are limited and labor market demand is skewed toward low-skilled workers. The wage premium for educated workers is negligible and well-educated people, who could in principle take on more demanding jobs, only have limited economic opportunities in these environments.<sup>1</sup> In contrast, labor markets in more-developed regions favor well-educated workers with higher productivity. In economically thriving areas, the wage premium of educated workers increases disproportionately to those of the less educated.

The diverging demand for labor in differently developed environments entails a clear mismatch of relative demand for skilled labor and individuals with high-educational achievements in less-developed areas. This misfit results in a lack of skill-adequate income opportunities. While it does not preclude highly educated workers from gaining employment, their income opportunities remain limited and it is unlikely that they will earn significantly more than those with low-educational attainments in their community. Concerns about appropriate wages and employment opportunities should therefore prevail among the highly educated. In contrast, educated workers in well-developed environments benefit from the higher demand for skilled labor and related income opportunities. Meeting the skill requirements of the labor market they are more sought after and able to secure employment and appropriate income, translating into less concerns about their economic situation. More favorable employment opportunities and higher income should generally improve the welfare perceptions of this group.

People with low-educational attainment, on the other hand, are favored by the demand for labor in less-developed environments. Income might be difficult to sustain overall, but these less-developed labor markets predominantly offer employment opportunities that fit the skill level of less-educated people. In turn, welfare insecurity for this group should be lower in less-developed areas than in booming environments. Here, the relative demand for labor does not comply with skill level. The disproportionate demand for educated labor results in a bigger wage gap between the high- and low-skilled. Living in these more-developed environments might not directly

<sup>1</sup>While high-skilled workers theoretically have the opportunity to move to different places, many remain in less-developed areas. On the one hand, they might remain due to the costs of moving exceeding the benefits. On the other hand, they could stay for other reasons (e.g., family ties), which can contribute to their welfare (Beegle *et al.*, 2011). I would like to thank the anonymous reviewer for their helpful remark that this could result in a conservative estimate of the welfare differences of highly skilled individuals between less- and more-developed areas. However, I cannot rule out that some individuals are forced to stay due to external factors, negatively affecting their perceived welfare. The effect could therefore, at least theoretically go in both directions, and with the empirical approach of this paper, it is unfortunately not possible to conclusively estimate the net effect of mobility.

deteriorate the economic situation of low-skilled labor, however, the increasing wage gap changes the benchmark for assessing their economic welfare. Despite living in thriving environments, the low-skilled are not able to benefit to the same extent than more educated people. Welfare perceptions of the less educated should therefore be less favorable the higher the economic development level of their environment, reflecting a sense of being left behind. Overall, this suggests that the level of development and corresponding labor market demand should affect perceived economic welfare differently depending on people's educational achievements.

### 3. Research design

#### 3.1 Local economic development

Even though perceptions of welfare are not independent of aggregate economic development levels, I argue that we need to focus on the economic conditions and labor markets in more restricted areas around people's place of residence. First, economic conditions do not change uniformly but vary substantially within countries (Kanbur and Venables, 2005; Kim, 2008). Therefore, some people still live in environments dominated by small-scale agriculture, while others live in industrialized, highly developed areas. Second, people usually live at a specific location and while they can commute to engage in economic activities, their daily mobility is limited (Marchetti, 1994; Kung *et al.*, 2014). Thus, the local economic development to which people are exposed and the labor markets they participate in are limited by the time and corresponding distance they are willing and able to commute.

Figure 1 visualizes the concept of local economic development. First, local development levels are dependent on the site of residence of the individual and encompass the area people are able to commute to on a daily basis. Second, these local environments are not restricted by subnational boundaries, as crossing provincial borders is not costly. People can reside in an economically weak region but might be able to commute to more prosperous areas to earn money. Thus, subnational administrative borders are unsuitable to capture the specific economic development levels people are exposed to. Third, crossing national borders often imposes costs or is sometimes even impossible. Therefore, local environments are confined within national boundaries. The conceptualization of local economic environments takes persistent and substantial within-country variation in economic conditions into account. Thereby, it captures the "economy" that directly affects people's livelihoods.

While the economic development and structural transformation of advanced industrialized economies also vary within and over time, shifts in the importance of sectors and related demand for labor are far less pronounced than in developing and emerging countries. Therefore, my empirical analysis focuses on 36 African countries characterized by high levels of within-country variation in economic development. Africa is the continent with the largest share of developing, least developed, and low-income countries. While the level of economic development still varies widely between and within the analyzed countries, the overwhelming majority pursues policies to enhance their economic development (Fosu and Ogunleye, 2015). However, a comprehensive analysis of the subjective, individual-level effects of different stages of development is still missing (Diao *et al.*, 2017).

To test the effect of economic development on individual welfare perceptions, I use geocoded individual survey data and combine it with information on local economic conditions. Linking geocoded individual survey data with fine-grained economic data, allows for a precise assessment of the effects of varying economic development levels on perceived individual welfare. I use survey data from the Afrobarometer between 2002 and 2014 (second to sixth waves). It provides a representative cross-section of citizens aged 18 and older for up to 36 African countries.<sup>2</sup> The survey data were geocoded by assigning longitude and latitude to the survey clusters of

<sup>2</sup>The 36 African countries included in the survey are Algeria, Benin, Botswana, Burkina Faso, Burundi, Cameroon, Cape Verde, Ivory Coast, Egypt, Gabon, Ghana, Guinea, Kenya, Lesotho, Liberia, Madagascar, Malawi, Mali, Mauritius, Morocco,

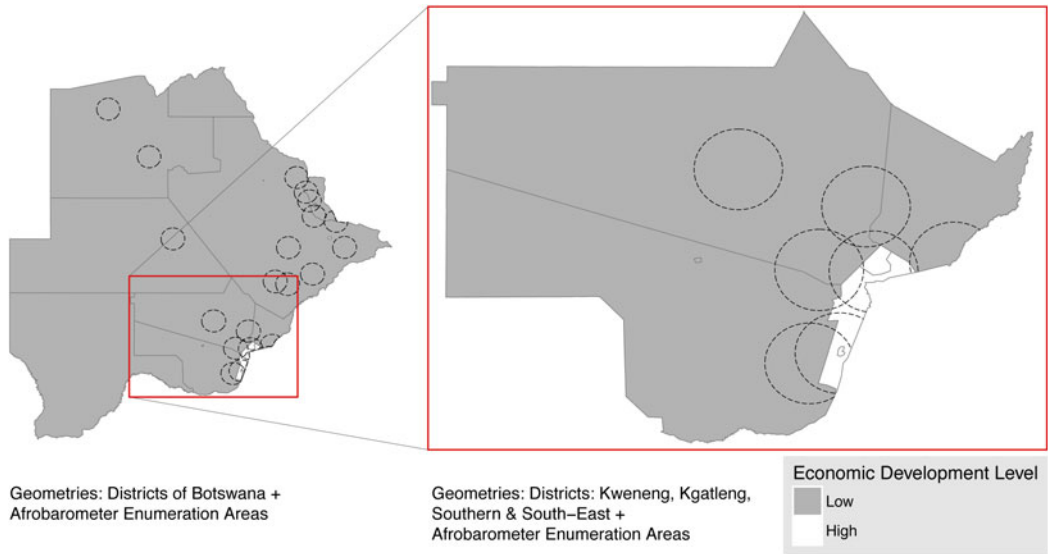


Figure 1. Local economic development.

respondents (BenYishay *et al.*, 2017). Each survey cluster represents the smallest geographical census unit from which respondents are sampled.<sup>3</sup> Overall, 182,937 respondents are clustered in 13,156 survey clusters, with on average 113 clusters per country and year.

### 3.2 Outcome variables: perceived labor market risks and living conditions

Local development levels and perceived economic welfare are linked via the (mis)match of local labor market demand and respondents' skill sets. I analyze two core aspects of economic welfare: perceived labor market risks and individual living conditions. The former allows to closely assess the link to labor market-specific welfare concerns, the second taps into people's individual considerations of economic welfare.

Perceived labor market risks are measured with a question asking respondents about the most pressing problem that should be addressed. Those who mention either "Wages, income, and salaries," or "Unemployment" as their most severe concerns are coded as feeling at risk in the labor market. Roughly 26 percent of respondents report being concerned about wages or unemployment while the remainder are not predominantly worried about employment insecurity. This operationalization of employment insecurity only captures income or job-related worries. Other economic concerns such as "Poverty," "Food shortage," or "Social Welfare" are excluded from the employment insecurity measure. While employment insecurity is arguably closely related to other economic worries, this conservative operationalization captures people who clearly worry most about these labor market-related problems. However, also individuals who are concerned about unemployment or wages in second or third place are arguably experiencing labor market risks, even though this might be a less pressing issue for them. To test the effect of local development levels on this more encompassing perception of labor market risks, all respondents who name wages or unemployment as the first, second, or third most pressing problem are coded as worried about the labor market.<sup>4</sup>

Mozambique, Namibia, Niger, Nigeria, Sao Tome and Principe, Senegal, Sierra Leone, South Africa, Sudan, Swaziland, Tanzania, Togo, Tunisia, Uganda, Zambia, and Zimbabwe.

<sup>3</sup>I exclude 818 respondents whose survey clusters could not be precisely geocoded.

<sup>4</sup>Results for this specification are reported in Table 5 in the Appendix.

The second outcome variable measures perceived economic welfare more generally with an item on self-reported living conditions. In contrast to generic satisfaction with life or happiness questions, reported living conditions should capture the perceived economic or material welfare of respondents more specifically. Around 49 percent of respondents report “Very Bad” or “Bad” present living conditions. In total, 21% of answers fall into the undecided category of “Neither Good nor Bad,” and 30 percent report that their living conditions are “Good” or “Very Good.”

### 3.3 Explanatory variables: measuring local economic development and individual education

To test how subjective welfare is affected by local development, it is necessary to approximate the specific economic environments of people. The size of these local economic environments is constrained by people’s (daily) mobility. Research on commuting patterns in African countries shows that mobility is limited and commuting is relatively time-consuming. While average commuting distances vary, they rarely exceed 30 km (Bryceson *et al.*, 2003). Therefore, I calculate a 30 km buffer zone around the location of each respondent. For robustness checks, I also use 10 and 50 km buffer zones, as well as dynamic buffers.<sup>5</sup> All local environments are clipped at national borders to account for the costs associated with crossing these boundaries.

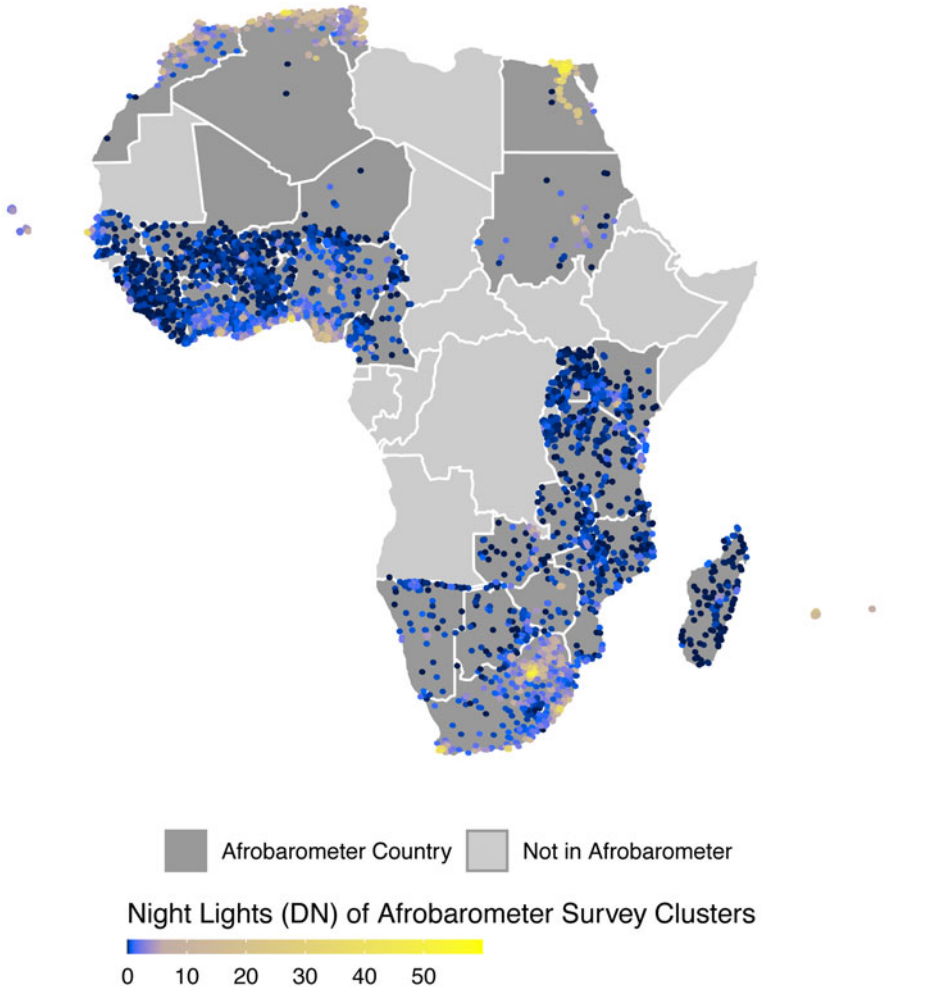
Official national or subnational economic data are not sufficiently disaggregated and flexible to measure the development levels of these customized local environments. Therefore, I use night light emissions, illumination recorded during nighttime, as a proxy for economic development. There are two main advantages to this proxy: first, night lights have a very high resolution and can be used to measure the economic development of customized areas or environments. Second, using night lights avoids relying on national statistics with limited data quality. Particularly in developing countries, differing methodologies and motivations to collect official economic data lead to serious measurement discrepancies and unreliable data accounts (Jerven, 2013). Night lights are a powerful proxy for economic activity: they are highly correlated with countries’ economic output in GDP (Chen and Nordhaus, 2011; Proville *et al.*, 2017) and capture economic activity and the development of subnational units (Henderson *et al.*, 2011). Even at the neighborhood level, they are a reliable predictor of economic wealth (Weidmann and Schutte, 2017).

I draw on the “stable lights” version from 1992 to 2013 by the US National Oceanic and Atmospheric Administration (Center, 1997), which is adjusted for the average amount of time the illumination is detectable and excludes non-stable light sources.<sup>6</sup> The annual raster data have a resolution of 30 arc-seconds, which is approximately one square kilometer at the equator. Values for raster cells range between 0 and 63 “digital number” (DN), where 0 DN would mean that no light was detected in a raster cell and 63 DN is the maximum illumination that can be registered.

Local economic development levels are measured by extracting the average emission of night light around the respondent in the year before the survey was conducted. The results are visualized in Figure 2. The map shows the distribution of survey clusters in the countries included in the Afrobarometer, dark (light) circles show survey clusters with relatively low (high) light emission and corresponding low (high) local development levels. For the analysis all light measures are log-transformed, this corresponds to the transformation of “traditional” GDP measures, addresses their heavily left-skewed distribution and the expectation that the effect decreases with higher values.

<sup>5</sup>The robustness checks with differently sized local environments are presented in Section A.6 of the Appendix and confirm the results from the 30 km specification.

<sup>6</sup>Additionally, including country–year fixed effects in the models corrects for fluctuation in satellite measurement across years (Chen and Nordhaus, 2011).



Dots: 30km buffers around Afrobarometer survey cluster centroids (5th wave) filled with 2010 night lights

**Figure 2.** Local development levels Afrobarometer survey clusters.

Overall, the average night light illumination for 30 km buffer zones ranges between 0 and 59.88 DN. The value 0 means that no nighttime illumination was detected, e.g., areas without any electrification or deserts. The highest levels of illumination are recorded for environments that encompass large cities. The average variance of lights within countries across all years is roughly 21 DN. The substantial variation of night lights within countries points to the salience of this measure for assessing the effect of spatial variation in economic development.

To test the hypothesis of a conditional effect of skill and local development on perceived welfare, individual skill is operationalized with a question asking respondents about “the highest level of education” they have completed. A number of studies suggest that an increase in years of schooling increases the skills of workers and thus their productivity and related output (Topel, 1999; Jones, 2001; Krueger and Lindahl, 2001). Education is a very general measure of skill and cannot account for sector or task-specific skills, as well as on the job training. However, skill specificity is less pronounced in my sample of developing and emerging countries, thus education levels should still adequately measure the skill set of respondents. The education item ranges from “No formal schooling” (0) to “Post-graduate” (9). Over a third of respondents



reported low levels of education (1–3). However, the share of people with intermediate education levels (4 and 5) is equally high. Another 14 percent of respondents have received some sort of tertiary education.

When levels of light emission are split into quartiles, 37 percent of respondents with no formal schooling live in environments which fall into the first quartile, while only 12 percent live in the most illuminated quartile of local environments. The distribution of low educated respondents per illumination quartile is comparable, with roughly a third of respondents in the first two illumination quartiles and approximately 17 percent in the fourth. Secondary education is most prevalent in the most illuminated environments, 33 percent of respondents with intermediary education categories reside in these areas. Their share in the first and second quartiles is roughly 40 percent and thus still quite substantial. Having received a university education makes living in highly developed areas more likely, 52 percent of university-educated respondents live in environments that are part of the most illuminated quartile. Still, 9 percent of this educational group live in the least-developed quartile of environments, while a further 12 percent reside in the second quartile.

For the analysis, I include individual controls for age, gender, employment status, type of residence (urban or rural), reported ethnic grievances, and the consumption of media in all models. I also control for incidents of lethal violence taking place within the local community in the year before the respondent is interviewed. For this purpose, I use the UCDP Georeferenced Event Dataset and overlap conflict sites with local environments of Afrobarometer respondents (Sundberg and Melander, 2013; Croicu and Sundberg, 2017). In addition, I control for characteristics of the enumeration areas: Afrobarometer interviewers report available services and the quality of infrastructure of enumeration areas. From items asking about the presence of a post office, public school, police station, a clinic, and an official market I construct a services index that ranges from 0 (none of these services are present in the enumeration area) to 5 (all of the services are present in the enumeration area). An infrastructure index is constructed by combining information on whether an electricity grid, piped water system, and sewage system are present in the enumeration area. Additionally, information on the road quality in the enumeration area is included in the infrastructure index. The infrastructure variable ranges from 0 (no electricity grid, piped water, and sewage system, and non-tarred roads) to 4 (enumeration area with electricity, piped water, sewage system, and tarred roads).

### 3.4 Estimation method

Due to the clustered nature of the data, I estimate hierarchical models with random intercepts, with individuals  $i$  nested in enumeration areas  $j$ . This entails that a unique intercept parameter is used for each enumeration area, accounting for the diversity of enumeration areas (McElreath, 2016). I use a logit model for the employment insecurity variable and an ordered logit specification for the living conditions variable. The models are defined as follows:

$$\begin{aligned}
 y_{ij}^* = & \beta_{0j} + \beta_{educ.localdev} \cdot educ_{ij} * localdev_j \\
 & + \beta_{educ} \cdot educ_{ij} + \beta_{localdev} \cdot localdev_j \\
 & + \beta_{age} \cdot age_{ij} + \beta_{female} \cdot female_{ij} + \beta_{empl} \cdot empl_{ij} \\
 & + \beta_{urban} \cdot urban_{ij} + \beta_{eth} \cdot eth_{ij} + \beta_{media} \cdot media_{ij} \\
 & + \beta_{cyear} \cdot X_{cyear,ij} + \beta_{service} \cdot service_j \\
 & + \beta_{infra} \cdot infra_j + \beta_{conflict} \cdot conflict_j + \epsilon_{ij}
 \end{aligned}
 \tag{1}$$

$\beta_{0j} \sim N(\beta_{0j}, \sigma^2 \beta_0)$ , where

labor market insecurity:

$$y_{ij} = \begin{cases} 0 & \text{(no employment insecurity)} & \text{if } y_{ij}^* < 0 \\ 1 & \text{(employment insecurity)} & \text{if } y_{ij}^* \geq 0 \end{cases} \quad (2)$$

living conditions:

$$y_{ij} = \begin{cases} 1 & \text{(very bad)} & \text{if } -\infty < y_{ij}^* < \tau_1 \\ 2 & \text{(fairly bad)} & \text{if } \tau_1 < y_{ij}^* < \tau_2 \\ 3 & \text{(neither good nor bad)} & \text{if } \tau_2 < y_{ij}^* < \tau_3 \\ 4 & \text{(fairly good)} & \text{if } \tau_3 < y_{ij}^* < \tau_4 \\ 5 & \text{(very good)} & \text{if } \tau_4 < y_{ij}^* < \infty \end{cases} \quad (3)$$

All models include the cross-level interaction between education and local development, as well as the above-described individual and context-level explanatory factors. The variable matrix  $X_{cyear}$  is an array of dummies for each country-year. All models are estimated in STAN with the No-U-Turn Sampler (NUTS) (Hoffman and Gelman, 2014) via the `brms` package for R (Bürkner, 2017).<sup>7</sup> Convergence of the four chains is assessed with  $\hat{R}$  diagnostics, which should be close to 1 and never exceed 1.03 in all models across all parameters (Gelman and Rubin, 1992). The results presented below are robust to non-hierarchical, linear specifications with country-year and spatial fixed effects for raster cells and survey cluster fixed effects (see Table 18 in the Appendix).

## 4. Results

My argument suggests that perceived economic welfare is dependent on the (mis)match of local labor market demands which depend on the specific development level and individual skill level. In line with this conditional argument, I expect the highly educated to be most satisfied with their welfare when living in well-developed areas. On the other hand, individuals with low education should feel more insecure and be less satisfied the higher the development level of their local environment.

### 4.1 Labor market insecurity

Table 1 shows the results for perceived employment insecurity. I report the point estimates as well as the lower and upper bounds of the 95 percent credible interval (CI). In addition, I include the number of effective sample size (NEFF) that indicates how the chains mixed. To support readability of the results I report which CIs exclude zero.<sup>8</sup>

A negative interaction effect of local development and education would support that education is a necessary condition for respondents to be unconcerned about job security in a well-developed environment. The coefficient for local development shows that higher local development levels coincide with more concerns about unemployment and wages from the least-educated respondents (0.33, 95 percent CI: [0.28, 0.38]).<sup>9</sup> The estimate for education is positive (0.14, 95 percent CI: [0.12, 0.15]), suggesting that insecurity increases in the least-developed areas the higher the educational attainment. The estimate for the interaction of individual education and local development is negative and its density interval clearly excludes 0.  $\hat{R}$  values for perceived labor market

<sup>7</sup>I run four chains with 1000 warm-up and 1000 sampling iterations. By default, `brms` uses improper flat priors over the reals for all population (individual) level parameters.

<sup>8</sup>This can be interpreted as an indication of statistical significance in the traditional, frequentist sense.

<sup>9</sup>In comparison, estimates for education and local development in a model without an interaction are also positive and their 95 percent credibility intervals exclude 0 (see Table 3 in the Appendix).

**Table 1.** Estimation results for perceived labor market risks

	Posterior mean	95% CI	CI excludes 0	NEFF
Education	0.14	[0.12, 0.15]	✓	4266
Local Development	0.33	[0.28, 0.38]	✓	3745
Education × Local Development	-0.07	[-0.08, -0.06]	✓	4148
Age	-0.01	[-0.01, -0.01]	✓	3704
Female	-0.07	[-0.1, -0.03]	✓	8954
Urban	-0.13	[-0.19, -0.07]	✓	4664
Unemployment	0.01	[-0.03, 0.05]	×	6261
Ethnic Grievances	0.04	[-0.01, 0.07]	×	7284
Media Consumption	0.03	[0.02, 0.04]	✓	7597
Services (EA)	0.02	[0.01, 0.04]	✓	5632
Infrastructure (EA)	0.09	[0.06, 0.11]	✓	4646
Conflict (EA)	-0.15	[-0.26, -0.04]	✓	5280
Observations: 94,053, Max. $\hat{R}$ : 1.03				

risk models are all below 1.03, indicating convergence of the four chains. The NEFF is never far below the number of iteration (four chains with 1000 iterations) indicating that the chains are efficient and show convergence.

In order to understand the impact of the interaction of education and night lights, the predicted probabilities are visualized for three different education levels in Figure 3. Individual controls (male, urban, employed, no ethnic grievances, average media consumption), enumeration area controls (average services and infrastructure and no conflict in the local environment), and country-year (country-year = South Africa 2008) are held constant. The first panel shows the effect of differently developed areas on employment insecurity for respondents who have no formal schooling, the second for those who completed secondary school, and the third for respondents who hold a university degree.

The predicted probabilities clearly show diverging concerns about employment and wages for these three education groups. In more-developed areas, respondents without any formal education are far more concerned about employment insecurity than their well-educated counterparts. While the probability of reporting concerns about employment of wages is below 25 percent in the least-developed areas, it is twice as high when living in the most thriving areas, which corresponds to my theoretical expectations. Employment insecurities of people with secondary degrees are not affected by the level of economic development. Yet, when having received a university degree the trajectory is inverted: the probability of being concerned about employment is highest in the least-developed areas and constantly decreases with higher economic development.

Perceived labor market risks do not disappear in more developed area, on the contrary, in these environments they are more pronounced for large parts of the population. Employment insecurity for the least educated is even more severe the higher the local development level. In comparison, university-educated individual’s job-related worries are more prevalent in the least-illuminated areas, where they cannot find suitable employment and income does not reflect investment in education. This trajectory is in line with the argument about the importance of diverging demand for skilled labor for economic welfare: while demand for skilled labor is relatively low in less-developed areas, it is substantially more in demand in prosperous environments. Therefore, the highly skilled are more economically secure in well-developed environments, while those with fewer skills feel threatened.

**4.2 Perceived living conditions**

Next, I show posteriors for the perceived living conditions (Table 2). I expect a positive interaction of local development and education, indicating that perceived living conditions improve

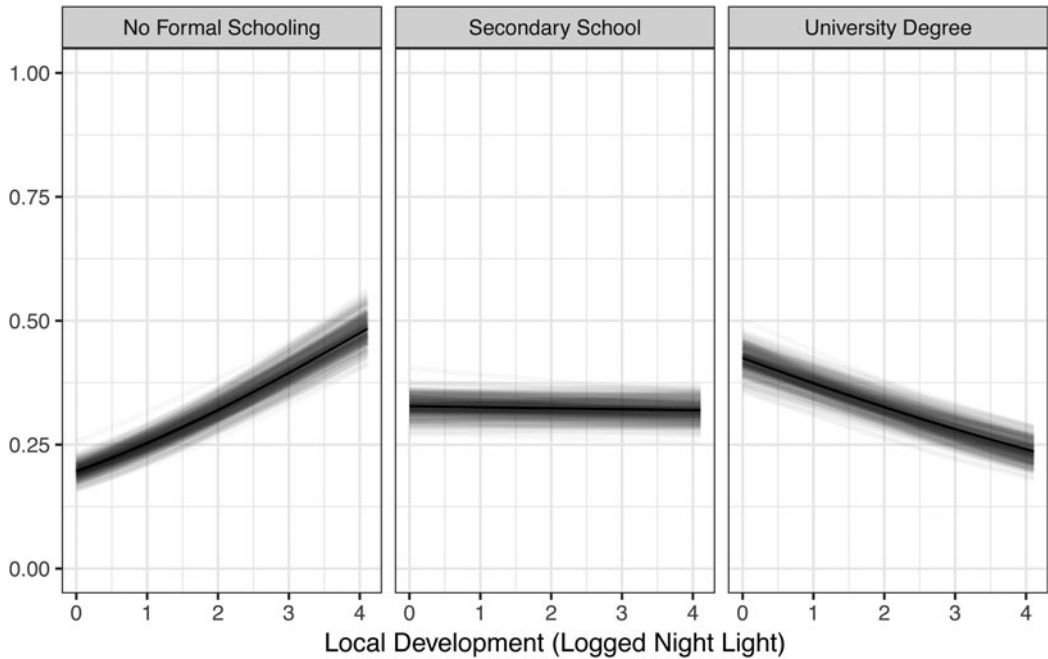


Figure 3. Predicted probabilities for perceived labor market risks.

above all for well-educated people in thriving environments. The results show that respondents with higher education are generally more satisfied with their living conditions (0.06, 95 percent CI: [0.05, 0.07]) and that living in economic environments with higher development levels affects the least educated negatively ( $-0.17$ , 95 percent CI: [ $-0.22$ ,  $-0.13$ ]). This supports the hypothesis that low-skilled people in thriving environments feel worse off than when living in less developed areas. The positive interaction estimate (0.3, 95 percent CI: [0.02, 0.04]) suggests that the negative effect of higher development levels is moderated by education: only the highly educated feel that their living conditions are better in prosperous areas.<sup>10</sup>

Figure 4 visualizes predicted probabilities for reported living conditions.<sup>11</sup> The trajectories clearly diverge dependent on the level of education: no formal schooling leads to generally worse perceptions of living conditions compared to all other education groups. These perceptions are even more negative the more developed the local environment. Having completed secondary education improves perceptions of living conditions compared to those with lower levels of schooling. Also, the negative effect of higher economic development levels vanishes. However, a positive impact of thriving environments is only visible at very high-education levels.

While the results show how perceived labor market risks switch, with the highly educated most concerned in the least-developed areas and the less educated more insecure in the most developed areas, perceived welfare is mainly diverging. This resonates with the importance of comparison and expectations for welfare perceptions. In the least developed areas employment opportunities are limited regardless of the individual's education level. People living in these least-illuminated areas do not expect to attain a high level of economic welfare given their lagging environment. Thus, reported living conditions of differently educated respondents are most alike. In line

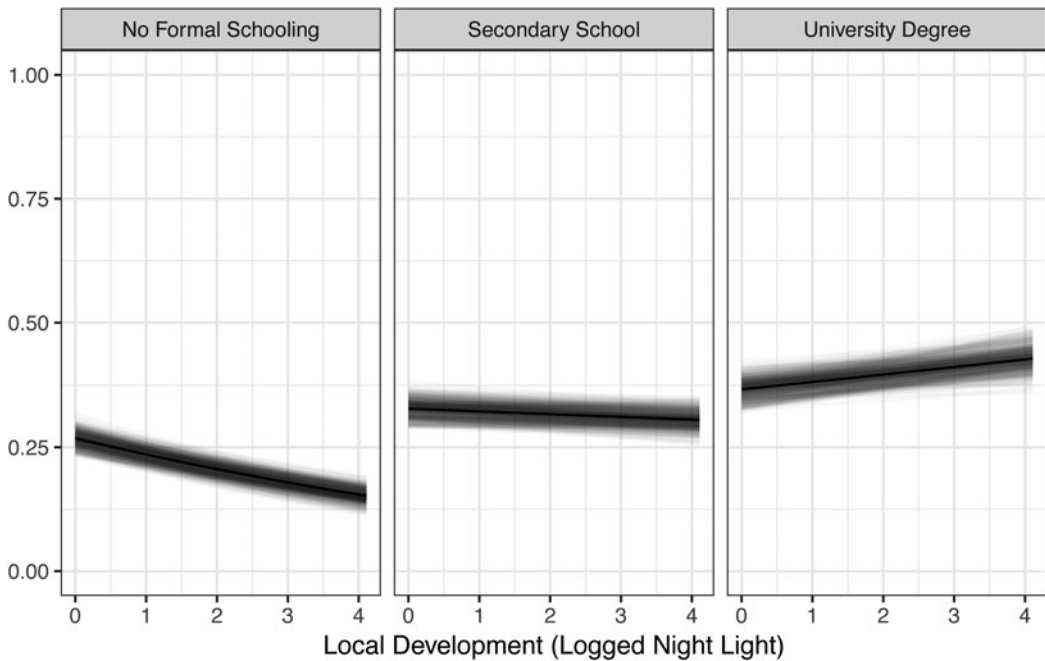
<sup>10</sup>The results of the non-interacted model (see Table 4 in the Appendix) show a positive effect of education (0.08) and a negative effect for local development ( $-0.06$ ) on perceived living conditions.

<sup>11</sup>Individual controls: male, urban, employed, no ethnic grievances, average media consumption. Enumeration area controls: average service and infrastructure, no conflict in the previous year. Country-year is South Africa in 2008.

**Table 2.** Estimation results for living conditions

	Posterior mean	95% CI	CI excludes 0	NEFF
Education	0.06	[0.05, 0.07]	✓	4169
Local Development	-0.17	[-0.22, -0.13]	✓	2886
Education× Local Development	0.03	[0.02, 0.04]	✓	4291
Age	-0.01	[-0.01, -0.01]	✓	4328
Female	0.08	[0.05, 0.11]	✓	6596
Urban	0.05	[0, 0.1]	x	2957
Unemployment	-0.09	[-0.12, -0.06]	✓	4301
Ethnic Grievances	-0.28	[-0.31, -0.25]	✓	6117
Media Consumption	0.07	[0.07, 0.08]	✓	7405
Services (EA)	-0.01	[-0.03, 0]	x	3701
Infrastructure (EA)	0.04	[0.02, 0.05]	✓	3401
Conflict (EA)	-0.06	[-0.15, 0.03]	x	3620
tau1	-0.40	[-0.56, -0.24]		163
tau2	1.22	[1.06, 1.38]		161
tau3	2.20	[2.04, 2.37]		161
tau4	4.64	[4.48, 4.81]		167

Observations: 94,475, Max.  $\hat{R}$ : 1.02



**Figure 4.** Predicted probabilities for perceived living conditions.

with the theoretical argument, they start diverging with higher local development levels. Living in these more prosperous areas can give rise to higher expectations, if these expectations are not met, perceived welfare stagnates. For those who cannot live up to their expectations, perceived welfare is even worse in these environments, as discrepancies between aspiration and actual living conditions widen. The less educated are worse off in comparison to others around them when living in thriving environments, which is reflected by their reported low living conditions. In contrast, the perceived living conditions of highly skilled workers clearly show that they are the

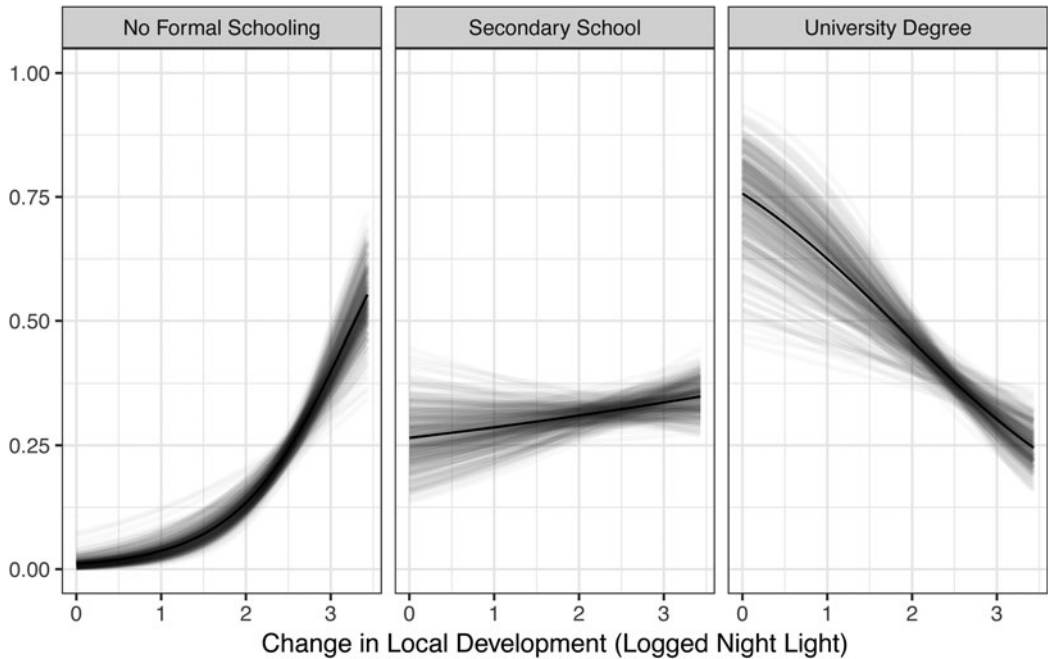


Figure 5. Predicted probabilities for perceived labor market risks (growth).

beneficiaries of economic development. Overall, concerns about employment and patterns of reported living conditions are dependent on the combination of local development levels and individual skill level. Economic development levels clearly exert heterogeneous effects on individuals and higher economic development even impacts some people negatively.

#### 4.3 Comparison to national development levels and changing local development

The results so far suggest that *local* economic development is central for individual welfare perceptions, however, these perceptions might still be influenced or relate to the national development levels. Comparison to economic conditions of other entities or at different levels can serve as a benchmark which allows people to properly assess the economic development of their local environment (Besley and Case, 1995; Kayser and Peress, 2012). To assess the importance of references to national economic development, beyond the inclusion of country-year fixed effects in the main analysis, I use the difference between local and national development levels as explanatory variable. This difference in mean night light emissions between the local and national level captures the importance of relative development levels of local communities within a country.

The results for employment insecurity using the difference between national and local levels do not change compared to the main results (Table 6 in the Appendix). However, the impact of this indicator on labor market risks is far less pronounced. For perceived living conditions (Table 7 in the Appendix) the disparity between local and national development is also negative and well-educated people perceive their living conditions more favorably. However, the interaction estimate is not significant anymore. These findings underline the importance of the absolute level of *local* development for people's perceived welfare and corroborate studies that show how local economic conditions are more tangible for people than national aggregate circumstances (Newman *et al.*, 2018).

Taking the local level serious the question remains whether people's perceptions are influenced by the level or change in economic development. The theoretical argument about the development levels could also be applied to changing local development: in areas that have grown more rapidly, we would expect a swift upward trend in demand for skilled labor. Therefore, higher economic growth (measured as the change in night light illumination) should negatively affect the perceived risks and welfare of the low-skilled and alleviate concerns about wages and unemployment for those who are well educated. Perceived labor market risks of people without formal education surge the higher the economic growth in the three years before the interview (Tables 8 and 9 in the Appendix). We see the inverse relationship between economic growth and concerns about employment for the most educated respondents (see also Figure 5).

The more economic growth the more dissatisfied are people with no educational attainments, and more highly educated respondents have a worse perception of their living conditions when their local economies are stagnating. The interaction estimate is positive, showing that the negative effect of economic growth is reversed for well-educated people. These results confirm the findings about the importance of *local* development, showing that where the economy is growing swiftly the well-educated labor force, increasingly in demand, holds more favorable welfare perceptions.

## 5. Conclusion

Assessing whether and especially for whom economic development improves welfare perceptions helps us to gain a more comprehensive understanding of the (uneven) effects of development. This is not only an important question for supplementing the evaluation of economic development on the basis of objective indicators. Answering it might help us to better understand patterns of perceived inequality in living standards and labor market risks, but also resulting political demands in the face of disparate economic development across and within countries. Assessing the effect of vastly different local economic conditions on people's attitudes is not only important and feasible for research focusing on developed democracies (Healy and Lenz, 2017; Larsen *et al.*, 2019), but also for analysis focusing on developing and emerging countries.

The evidence from a large number of African countries over more than a decade presented here clearly shows the uneven effect of local economic development on perceived economic welfare. While the well-educated feel more secure and have a more positive perception of their welfare, the higher the development level of their local community, the opposite is true for those with no or low-educational achievements. For the low-skilled, higher economic development gives rise to labor market insecurities and their perceived welfare is generally lower in thriving economic environments. These results are in line with the argument that a mismatch in local demand for skilled labor and the individual's own educational attainment results in an adverse welfare perception, which applies to the highly educated in less developed environments and the low-skilled in booming areas. In essence, higher economic development drives a wedge between differently skilled people in terms of perceived labor market risks and welfare. While the Afrobarometer data do not allow to trace individual trajectories of economic welfare across time and place due to the cross-sectional nature of the data, the findings indicate that changing places of residence, especially the move to thriving areas, is not a silver bullet for everyone, but is mainly profiting high-skilled workers. Future studies should delve deeper into the labor mobility of individuals to better understand who is willing to stay in less economically favorable environments and who is willing to move to more thriving areas.

The results presented here underline the importance of *local* economic conditions for people's welfare perceptions. Local development levels are vital as they determine the economic conditions to which people are directly exposed. With prevailing spatial variation in economic development, people in the same country live in vastly differently developed local communities. To gain a nuanced understanding of the effects of economic development we therefore need to zoom into these local areas that center around people's site of residence and are confined by the extent

of individual mobility. To measure these local economic conditions we cannot rely on often non-existent and unreliable regional data accounts. However, disaggregated geographically referenced proxies for economic activity, i.e., nighttime illumination as used here, are available and can help us to approximate the economic conditions that people encounter more accurately.

In this paper, I have combined disaggregated raster data on night lights with precise information on respondents' location. Thereby, it has been possible to measure the economic development level of people's local communities. This approach makes use of detailed geographic information recently made available by some large cross-country household surveys and attempts to substantially refine our understanding of the economic conditions to which people are exposed. In addition, it showcases the potential for further political economy research interested in concisely combining individual and contextual data, as well as the potential of high-resolution proxies such as night lights in individual level analyses. The results reiterate findings on the importance of local economies from developed countries and show that local economies have a strong impact on the perceived welfare and labor market risks of people.

However, the results also emphasize the importance of scrutinizing how individual characteristics, such as individual skill levels, interact with economic conditions when analyzing their individual-level effects. They show that higher economic development profits some people but seems to hurt others, depending on characteristics that determine the individual's fit to local labor market demands. Heterogeneous individual-level effects might also be able to reconcile mixed findings in other literatures, connecting economic conditions with political outcomes. When some people win and others lose out when affected by the same economic situation, we can make sense of differing findings connecting the distributive effects of the economy and political behavior, e.g., finding a deterring, enhancing, or even no effect of economic openness on protest (Robertson and Teitelbaum, 2011; Dodson, 2015; Karakaya, 2016).

The paper reveals that economic development might not improve the economic welfare perceptions for everyone, a problematic, inequality-increasing trend. This is especially the case regarding the negative trajectory of perceived labor market risks and living conditions on the part of poorly educated people who reside in well-developed areas. Leaving these people further behind runs counter to the aim of improving the livelihood of all citizens, the poor in particular. At minimum, the less educated, who are often also the poorest citizens, do not feel the benefits of higher economic development. While we might value economic growth and higher development levels as such, these positive trends do not automatically trickle down to everyone. In contrast, some people feel worse off when living in thriving environments than in less-developed areas. Higher economic development levels increase gaps in perceived welfare with potential polarizing repercussions for people's political attitudes and behavior.

**Supplementary material.** The supplementary material for this article can be found at <https://doi.org/10.1017/psrm.2023.47>. To obtain replication material for this article, <https://doi.org/10.7910/DVN/PWWAOM>

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