



# A gendered resource curse? Mineral ownership, female unemployment and domestic violence in Sub-Saharan Africa

Mario Krauser · Tim Wegenast · Gerald Schneider ·  
Ingeborg Hess Elgersma

Published online: 13 November 2019

© Arbeitsgemeinschaft für Friedens- und Konfliktforschung e.V. (AFK) und die Autoren 2019

**Abstract** Several studies suggest that the extractive industry has negative consequences for gender equality despite the often positive growth impact of natural resources. We re-examine this claim at the sub-state level in sub-Saharan Africa and argue that we need to differentiate between ownership arrangements in the extractive industry. To test our argument on the gender dimension of the resource curse, this article employs unique data on the control rights of minerals within sub-Saharan countries as well as data from Afrobarometer and Demographic and Health Surveys (DHS). Our quantitative analyses explore how international vs. domestic ownership of copper, diamond and gold mines affects the labor market integration of females and intimate partner violence. The regression results suggest in line with our theoretical expectations that gender-specific structural labor market shifts within extractive industries are contingent on mineral control rights. Our models show that within mining areas, only domestic ownership reduces male unemployment. While domestic mining seems to reinforce the traditional male breadwinner model, internationally owned mineral extraction induces structural labor market changes: women

---

**Electronic supplementary material** The online version of this article (<https://doi.org/10.1007/s42597-019-00019-8>) contains supplementary material, which is available to authorized users.

M. Krauser (✉) · T. Wegenast · G. Schneider  
International Relations Chair, Department of Politics and Public Administration and Graduate School  
of Decision Sciences, Universität Konstanz, Box 86, 78457 Konstanz, Germany  
E-Mail: [mario.2.krauser@uni-konstanz.de](mailto:mario.2.krauser@uni-konstanz.de)

T. Wegenast  
E-Mail: [tim.wegenast@uni-konstanz.de](mailto:tim.wegenast@uni-konstanz.de)

G. Schneider  
E-Mail: [Gerald.Schneider@uni-konstanz.de](mailto:Gerald.Schneider@uni-konstanz.de)

I. Hess Elgersma  
Kristiansand, Norway  
E-Mail: [ingeborgelgersma@hotmail.com](mailto:ingeborgelgersma@hotmail.com)

abandon subsistence farming activities and migrate to the service sector. Our results further indicate that this shift of traditional gender roles within rural mining areas is associated with less intimate partner violence.

**Keywords** Resource curse · Gender equality · Intimate partner violence · Labor market integration

## **Ein genderpezifischer Ressourcenfluch? Eigentumsrechte im Bergbau, weibliche Arbeitslosigkeit und häusliche Gewalt in Subsahara-Afrika**

**Zusammenfassung** Mehrere Studien deuten darauf hin, dass sich der Bergbau von wertvollen Mineralien trotz seiner positiven Wachstumseffekte negativ auf die Gleichstellung der Geschlechter auswirkt. Wir überprüfen diese Behauptung für Subsahara-Afrika und argumentieren, dass wir zwischen den Eigentumsverhältnissen in der mineralgewinnenden Industrie unterscheiden müssen. Um diese Hypothese zur Geschlechterdimension des Ressourcenfluches zu testen, verwendet dieser Artikel einen neuen Datensatz zu den Kontrollrechten in der rohstoffgewinnenden Industrie sowie Daten aus Afrobarometern sowie den Demographie- und Gesundheitsbefragungen (DHS). Unsere quantitativen Analysen untersuchen, wie sich der internationale vs. inländische Besitz von Kupfer-, Diamant- und Goldminen auf die Arbeitsmarktintegration von Frauen und die interpersonelle Gewalt auswirkt. Die Regressionsergebnisse deuten im Einklang mit unseren theoretischen Erwartungen darauf hin, dass geschlechtsspezifische strukturelle Arbeitsmarktveränderungen im Bergbau von den Eigentumsrechten in diesem Sektor abhängen. Unsere Modelle zeigen, dass Bergbaugebiete mit inländischen Eigentümern eher eine Reduktion der Arbeitslosigkeit von Männern erfahren. Während ein von Inländern dominierter Minensektor das traditionelle männliche Broternährer-Modell zu stärken scheint, führt der international kontrollierte Bergbau zu strukturellen Arbeitsmarktveränderungen: Frauen verlassen die Subsistenzwirtschaft und wandern in den Dienstleistungssektor ab. Unsere Ergebnisse zeigen weiterhin, dass diese Verschiebung der traditionellen Geschlechterrollen in ländlichen Bergbaugebieten mit einer Reduktion der Gewalt zwischen Intimpartnern verbunden ist.

**Schlüsselwörter** Ressourcenfluch · Gleichstellung der Geschlechter · Gewalt in der Partnerschaft · Arbeitsmarktintegration

### **1 Introduction**

Female unemployment increased from 45.1 to 70.9% between 2006 and 2011 in the Zimbabwean district Kadoma, but fell from 64.4 to 63.6% during the same period of time in the Chegutu district. The workforce differed in its dependence on the mining industry and in particular in its exposure to internationally-controlled mineral extraction across both regions. While there were ten mines in Kadoma owned by international investors, the Chegutu district hosted one mine with domestic ownership.

One of the main tenets of the ever-growing literature on resource abundance highlights the existence of gender-specific labor market effects of mining operations in African countries. According to Ross (2012, p. 111), for example, oil wealth decreases the labor market integration of females, while economic development typically has the opposite effect: "... growth that is based on industrialization tends to draw women into the workforce and ultimately lead to female empowerment. Growth that is based on the sale of oil and gas, however, does not produce more jobs for women, and can even block the path toward gender rights". Kotsadam and Tolonen (2016) extend this thesis to other extractive industries and show that total female labor participation decreases after a mine opening in sub-Saharan Africa. At the same time, the authors point to structural labor market shifts: after mine openings, women's occupational activities tend to relocate from subsistence agriculture and raising livestock to jobs in the service sector. Benschaul-Tolonen et al. (2019) confirm that men are likely to benefit from direct employment within the mining sector while women profit from indirectly generated jobs in the service sector and are less likely to work in agriculture in areas hosting active mines.

Our article qualifies this gendered interpretation of the resource curse, arguing that the micromanagement of natural resources makes a crucial difference. We contend that the effects of mining on employment and gender equality is largely contingent on ownership patterns. According to our theoretical model, domestically owned firms tend to hire local male workers and promote forward and backward economic linkages through local content policies, while international investors pay less attention to the plight of the regional population and often resort to workers from abroad to fill local vacancies. This results in limited labor market opportunities for local men in the surroundings of international mines who are unable to attain employment in the formal mining sector as they are not adequately skilled for large-scale industrial mining. In extractive regions where domestic mining companies are more inclined to hire the local male population, the male breadwinner model often persists. In contrast, women seek low-paid jobs in the service and petty trading sectors or resort to prostitution in order to contribute to the household income within areas hosting international firms.

We further argue that this structural labor market shift has direct consequences for the incidence of domestic violence. On the one hand, the disruption of traditional gender norms induced by international foreign investors increases the uncertainty and frustration among men who resort to domestic violence as a means to reassert their power within households. The large influx of foreign male workers caused by internationally controlled mining may promote at the same time intimate partner violence by spurring male-to-female sex ratios. On the other hand, internationally controlled mining may increase women's cash earning possibilities, reduce gender wage gaps and strengthen women's bargaining power by shifting employment from agriculture to services. The ensuing female empowerment reduces the exposure to violence. Although it is difficult to predict which of these two theoretical pathways will prevail, we hypothesize that—particularly in the medium and long-run—the empowerment effect of the described labor market transition should prevail.

Our quantitative analysis of the mining industry in sub-Saharan Africa lends some support for our theory of how the distribution of property rights in the resource

sector affects the labor market integration of females and the risk of women to experience violence at home. Our longitudinal models show that male employment is consistently higher in regions hosting domestic mining companies. In contrast, the total number of women actively looking for a job is higher in areas where international firms control mineral extraction. Moreover, we find that merely the proximity to foreign mining investment leads women to abandon self-employed farming and search for jobs in the service sector. Our study also finds some support for the conjecture that the structural labor market shift induced by international ownership reduces intimate partner violence.

## 2 Mining ownership rights, labor market inequalities and gender-based violence

The ever-growing literature on the “paradox of plenty” has identified numerous social and economic ills of resource windfalls. This article examines how resource ownership influences two interrelated dimensions of what we call the “gendered resource curse”—gender-specific structural labor market shifts and the occurrence of intimate partner violence. Recently, several authors have linked mining-induced transformations of labor market with domestic violence (c.f. Benschaul-Tolonen and Baum 2019, pp. 28–29). We argue that both effects are contingent on the ownership structure of mining companies, with state-owned companies tending to hire from the local workforce and internationally controlled mineral extraction largely relying on foreign workers. We will in the following outline the theoretical framework that links mineral control rights to employment and interpersonal violence.

### 2.1 Labor market implications

As highlighted by previous authors, the costs and benefits of mineral extraction may be unevenly distributed among men and women. Due to the crowding out of tradable goods industries, environmental degradation or upheavals of traditional norms, women may be particularly hurt by extractive industries (c.f. Brain 2017; Jenkins 2014; Ross 2008, 2012; UNECA 2011). Once a mine opens, a certain share of the local male population is employed by the operating mining firm. Women’s direct involvement in large-scale industrial mining, conversely, is very low (Eftimie et al. 2009) and limited to ancillary and administrative positions (Lahiri-Dutt 2006). In many rural societies in Africa and Latin America, the traditional role of women is closely intertwined with the cultivation of traditional crops (Bhanumathi 2009; Bryson 1981). With the expansion of mining, women’s occupational activities tend to shift from subsistence agriculture and raising livestock to domestic work or low-paid jobs in the service sector (Hinton et al. 2006; Kotsadam and Tolonen 2016).

As various studies show, mining-induced environmental degradation, water shortage, dispossession or changes in land prices often threaten female agricultural livelihoods (Aragón and Rud 2016; Bebbington et al. 2008; Muchadenyika 2015; UNECA 2011; Velásquez 2012). While abandoning traditional roles in small-scale farming, women seek new job opportunities in the expanding service sector. Benschaul-Tolo-

nen et al. (2019) demonstrate that, while men living around local mining communities often benefit from direct employment opportunities, women tend to profit from indirectly generated jobs in the service sector and are less likely to work in agriculture in areas hosting active mines. However, given the substantial size of female agricultural employment in poor rural societies, only a portion of women who abandon farming is absorbed by these emerging sectors (c.f. Kotsadam and Tolonen 2016). As a result, overall female unemployment increases within expanding mining regions.

The main contribution of this article is to show that the potential mining-induced labor market shifts and the consequential change of traditional gender roles is contingent on minerals' control rights. We argue that—by relying mostly on a local labor force and creating more jobs—domestic mining companies largely preserve the male breadwinner model: whereas the local male population finds employment opportunities within the mining sector, their spouses are not compelled to search for alternative income sources and work as housewives or as subsistence farmers whenever possible. In contrast, the lack of male job opportunities in mining communities hosting international firms prompts women to contribute to household's income by migrating from the agricultural to the service sector.

For two interconnected reasons, we expect multinational mining companies to generate fewer local jobs compared to domestic firms. Multinationals commonly rely on an international network of skills, technology and machines, thereby operating independently from the local context. While international investors have a comparative advantage in the employment of semi-skilled and skilled labor, domestic firms have to invest more in human capacity building and tend to hire more locally (c.f. Wegenast et al. 2019b). Qualitative evidence shows that multinational oil or mining firms import skilled labor and only little low-skilled and low-paid work is hired locally (Mohan 2013). International resource extracting companies also tend to hire non-local workers throughout the African continent (Lucas 1987; Taylor 1990).

Particularly state-run domestic firms are likely to generate more jobs compared to international investors. Not operating under the exclusive premise of profit maximization, state-owned enterprises may pursue non-commercial goals. Serving as national developmental actors and having politicians as principals, state enterprises often seek to maximize political legitimacy (La Porta and López-de-Silanes 1999; Wilson 2015). The employment of workers living within mining areas is one vehicle to promote support among voters. In fact, quantitative analyses indicate that government ownership in oil production or mineral extraction leads to a larger workforce than necessary to meet commercial goals. Public firms are thus more likely to favor excessive employment than private international companies (Eller et al. 2011; Hartley and Medlock 2008). Case studies confirm that local unemployment rises after the privatization of the mining industry (Mususa 2010).

Unable to rely on expatriate workers, domestic resource extracting companies have to invest in local human capacity building and the promotion of local con-

tent policies, thereby fostering backward linkages and economic diversification.<sup>1</sup> Adewuyi and Oyejide (2012) demonstrate that multinational oil companies in Africa are less likely to be involved in information exchange than their local counterparts. According to the authors, IOCs tend to profit from information flows within their internal multinational operations. Business administration studies have further shown that the presence of local partners in the ownership structure of multinational firms promote technology transfer, skills upgrading and local linkages (Amendolagine et al. 2013; Fessehaie 2012; Morris et al. 2012). In fact, two recent studies show that international mining companies are less likely to hire locally and to promote local economic wealth (Wegenast et al. 2019a, b).

As has been argued, domestic mining companies may be more apt to create local jobs—either by direct employment within the mining industry or through backward and forward linkages—compared to international firms. Foreign companies tend to import a high share of input such as equipment, machinery and labor from abroad, limiting potential know-how and wage spillover and reinforcing the enclave character of extractive industries.

**H1** Compared to international mining companies, only domestic firms reduce local male unemployment.

We claim that the described ownership-driven effects of mining on male employment have direct consequences for female labor market participation. Counting on the income of husbands employed within the mining sector, women in areas hosting domestic firms are not urged to search for alternative jobs, even when their traditional occupation as self-employed farmers is threatened by mining-induced environmental degradation or dispossession. In contrast, by failing to employ the local male labor force, international mining companies should prompt women to look for new income sources. Abandoning family farming, women search for employment opportunities in services, petty trading retail, manual work or even prostitution. Thus, we argue that only areas hosting internationally-controlled mines experience a shift in female labor markets. As women's participation in the agricultural sector of sub-Saharan African countries is very large and alternative sectors such as services cannot absorb all women formerly employed in farming (c.f. Kotsadam and Tolonen 2016), we further expect that total female unemployment should rise around internationally owned mines.

**H2** International mining investments promote a structural shift within female labor markets: compared to domestic mining companies, foreign firms reduce female employment in subsistence farming and increases female labor participation in the service sector.

**H3** Internationally-controlled mineral production increases total female unemployment.

---

<sup>1</sup> Local content laws require foreign companies to use the local labor force and local firms for the procurement of goods and services (see Tordo et al. 2013).

## 2.2 Domestic violence

Shifts in women's occupational status and changes of gender roles traced back to factors associated with international ownership are likely to impact on women's propensity to experience domestic violence. As argued above, international ownership of mines should prompt women to actively look for a job as their partners are rarely directly hired by multinational companies and family farming may become unfeasible due to mining-induced environmental degradation or dispossession. Highlighted by a large body of research, changes in employment status and intimate partner violence seem to be closely linked (e.g. Atkinson et al. 2005; Yyas and Watts 2009; Choi and Ting 2008). Women, left displaced from previous employment in small-scale agriculture, need to find new sources of employment. We argue that, by creating direct or indirect job opportunities particularly for men, domestic mining companies largely preserve traditional gender roles and the male breadwinner model within rural societies. While men are employed in the mining industry or related sectors, women typically take care of the family and—whenever possible—continue to pursue small-scale farming activities. In areas hosting international mining operations, contrarily, women are pushed into actively looking for jobs in order to contribute to the income of households.

Theoretically, the described labor market shift may have different effects on intimate partner violence. The causal pathways underlying the relationship between mining, occupation and domestic violence are highly complex and rather difficult to predict (c.f. Benschaul-Tolonen and Baum 2019, pp. 28–29). Breaking with the male breadwinner model, new employment opportunities e.g. in the service sector and increasing cash earnings may reduce women's dependence on spouse's income, strengthening their bargaining power and triggering emancipatory processes that oppose and condemn domestic violence. Empirical research has for example shown that lower gender wage gaps are associated with less violence against women (Aizer 2010).

Benschaul-Tolonen (2018) finds evidence for this empowerment mechanism. Analyzing Africa's gold mining sector, the author hypothesizes that entrenched gender norms change due to shifts in women's earning potential following a transition in employment from agriculture to the service sector. The study shows that industrial gold mine openings have reduced women's acceptance of domestic violence within mining communities. In fact, martial dependency theory highlights that the increase in women's dependency on their partner as a result of a rise in men's income compared to women's income can foster domestic violence (Yyas and Watts 2009). In the specific context of mining communities, the income effect that enables men to buy more alcohol can also be highlighted as a trigger of domestic partner violence (Muchadenyika 2015, p. 715; Cane et al. 2013). Following this line of reasoning, internationally-controlled mining—that disrupts the male breadwinner model—should reduce the risk of women facing domestic violence.

In contrast, the so-called backlash theory predicts that income gains are associated with higher exposure risk and more domestic violence. Increases in women's resources (such as income or education) may lead to a higher risk of abuse as men may resort to violence in order to reinstate their dominance (c.f. True 2012). Cools

and Kotsadam (2017, p. 211), for example, find evidence that “employed women face greater risk of abuse in communities with relatively higher acceptance of wife-beating”. In a similar vein, Heath (2014, p. 32) demonstrates that uneducated women in Bangladesh tend to suffer more domestic violence when facing increasing access to labor market opportunities as “their husbands seek to counteract their increased bargaining power”.

Resource theory, taken from the literature on the causes of domestic violence, predicts that overall increases of the socio-economic status of men should relieve them of the feeling of being an inadequate provider of material resources (Goode 1971). Increases in income may thus make men feel more in line with societal gender norms, thus reducing the need for compensation through domestic violence (Atkinson et al. 2005). Relative resource theory, which stipulates that it is not the overall income of the family but changes in the distribution between the genders that causes domestic violence, would also predict that the higher relative income for men should leave the occurrence of domestic violence unchanged or even reduce it (Macmillan and Gartner 1999; McCloskey 1996). According to our argumentation outlined above, only domestic mining companies are likely to contribute to the employment of men within mining communities. Also, they are less likely to drive shifts in female labor markets, thus reducing the exposure risk among women. According to this logic, domestic mining firms should in fact be associated with less intimate partner violence.

Moreover, international mining companies may considerably distort local sex ratios as they tend to rely on a foreign male workforce. High in-migration of non-indigenous men employed by international mining companies may provoke upheaval in traditional rural communities, furthering social conflict and domestic violence (c.f. Jenkins 2014, p. 334). As for example noted by Muchadenyika (2015), the occurrence of extramarital affairs with migrant mining workers, prostitution and divorce has increased with the opening of diamond mines within four analyzed districts in Zimbabwe.

As the miners are mainly men, immigration leads to severe shocks to the population’s gender balance. The *Sydney Morning Herald* reports a story from the South-African town of Lephalale, where mine openings of an Australian company transformed the town from equal gender balance to a situation of two men per woman in only a couple of years. As reported in the story, the gender imbalance was followed by the arrival of the sex industry and eventually a rise in teen pregnancies (Bagshaw 2017). The gender imbalance and the privileged role of the foreign male workforce can also foster increased jealousy among local men, and the perceived threat of infidelity is shown to increase intimate partner violence (Conroy 2014). In fact, studies corroborate the predictions of evolutionary biology that high sex ratios (i.e., more men than women in the population) are associated with more intimate partner violence (D’Alessio and Stolzenberg 2010). In particular if such shocks to local population compositions are sufficiently large, they may affect domestic violence directly. Thereby, the effect of international mining could potentially stretch beyond our main channel, which we theorize to operate through shifts in the labor market.



Furthermore, the in-migration is shown to cause discontent among male indigenous men, as the migrants deprive them from securing jobs in the formal mining sector. Coderre-Proulx et al. (2016) report from Zambia that as foreign companies tend to hire mostly foreign workers and because of high overall unemployment levels, indigenous men are pushed to work in the informal mining sector. The marginalization of local men provides grounds for discontent, which in line with the resource theory of domestic violence outlined above, might provide breeding grounds for attempts to compensate by resorting to domestic violence taken out on women and children. Likewise, if men observe women adapting to the changes in labor market opportunities by turning to petty trade or prostitution, relative resource theory predicts increased intimate partner violence as men seek to offset women's economic advances in men's disfavor (Choi and Ting 2008).

The relationship between mining-induced employment changes and domestic violence against women can hence be characterized as unclear. The theoretical channels described above can all be in force simultaneously, and therefore partly cancel each other out, leaving an ambiguous result on the propensity of women to experience domestic violence in regions where domestic- or internationally-owned companies are the main actor within the extractive industry. Nevertheless, we hypothesize that—particularly in the long run—the intimate violence reducing effect of female empowerment resulting from a decline of the male breadwinner model due to structural shifts in the female labor market should prevail.

**H4** Regions hosting internationally-controlled mineral extraction experience lower levels of intimate partner violence.

### 2.3 Broader implications

Scrutinizing the connection between mining, unemployment and domestic violence is vital for a deeper understanding of how resource conflicts develop in general. As discussed above, the search for new employment opportunities by women living in areas hosting international mining companies may contribute to their empowerment and emancipation, reducing the incidence of domestic violence.

Individuals who have experienced violence either as a perpetrator or as a victim are more likely to behave aggressively and to support rebel and terrorist organizations (Victoroff et al. 2010). Radtke et al. (2011) show that experiences of violence can be transmitted through generations as children of battered pregnant women endure epigenetic changes that are relevant for their social behavior as adults. Where experiences of interpersonal violence follow from shifting gender norms in mining areas caused by distinctive extraction modes, a deeper understanding of underlying mechanisms may further the understanding of how large-scale violence develops.

Beyond the straightforward case that unemployment lowers the opportunity costs of joining a rebel organization, even the perceived losses can affect the likelihood of rebellion in the light of deprivation theorists such as Gurr (1970). This early grievance approach posits that collective feelings of frustrations can emerge in the event that people experience a large discrepancy between a reality they believe to deserve and a future state they expect. These may in turn raise the risk of collective

violence. In Germany, for instance, changes in local gender dynamics following large influxes of male foreigners have been found to increase the incidence of hate crimes (Dancygier et al. 2019). In line with this argument, Wegenast and Schneider (2017) show that state repression is larger around international mines and hence in region where discontent is particularly large. This research suggests that risk of armed conflict and human rights violations experienced around mines crucially depends on the labor market integration of males and females in the resource sector and the exposure to intimate partner violence that missed economic opportunities create.

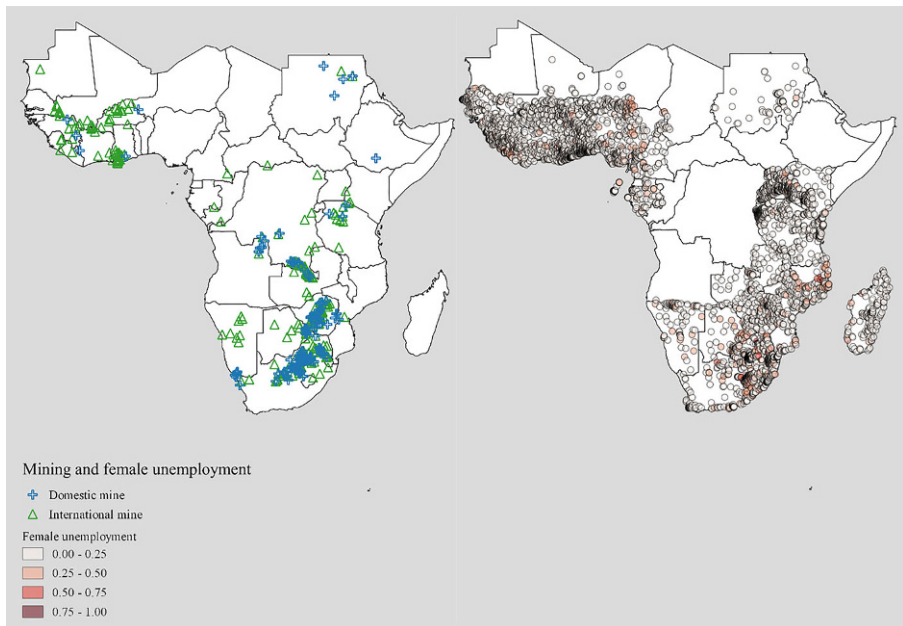
### 3 Research design

#### 3.1 Mineral ownership and female unemployment

To test the arguments presented above, we exploit features of three unique data sources: the geocoded data from both the Demographic Health Survey (DHS) and Afrobarometer, as well as likewise georeferenced data on the ownership of individual industrial mining operations with a high temporal resolution. This latter dataset draws on details from Infomine (2013), the U.S. Geological Survey (USGS), the operating firms' reports and their websites. Based on these indications, it conveys yearly information on participating companies' shares, production status and exact location of 328 gold, 125 diamond and 85 copper mines for 38 sub-Saharan countries over the period 1997–2015 (Wegenast and Schneider 2017). Splitting these records by country reveals how unevenly African nations are blessed by this mineral wealth. South Africa hosts as many as 146 gold mines and is followed by Zimbabwe with 62. Other countries have a maximum of 25 (Ghana) and a minimum of one gold mine (e.g. Zambia). South Africa is also the country with most diamond mines (70) with other countries harbouring 14 at the most (Angola) or at least one (e.g. Cameroon). When it comes to copper mines, the Democratic Republic of the Congo ranks at the top with 39; it is followed by Zambia with 20. Other countries have as many as nine (Botswana) or only one copper mine (e.g. Angola).

Our main independent variable of interest—mining control rights—is drawn from this new dataset. It reflects the number of mines that are controlled by a majority of domestic or international companies. We calculate this indicator by dummy coding each facility as majority controlled whenever the relevant company holds at least 66 percent of the shares and adding this number up for each of our unit of observation.

The first type of our two units of observation consists of 25 and 50km buffer zones that we compute around respondents to leverage the distinct geographic disaggregation of Afrobarometer data. Apart from this feature, Afrobarometer is also one of the most comprehensive data sources on socio-economic development in Africa, as it records public attitudes for more than 30 countries on the continent. In order to guarantee representativeness, data are collected based on a stratified, multi-stage area probability approach focused on the main subnational unit of government (state, province or region) and urban or rural locations. The smallest geographical



**Fig. 1** Mine ownership and female unemployment in Sub-Saharan Africa

unit for which reliable population data is available is the primary sample unit (PSU), which most often constitutes the enumeration area (EA). Every PSU combines eight survey respondents into one cluster.

For the purpose of our analysis, we use round six of Afrobarometer consisting of 36 national surveys conducted between 2014 and 2015.<sup>2</sup> We joined point coordinates from the mine-level dataset with the geo-location of Afrobarometer respondents through spatial proximity using QGIS and two steps. First, we calculated the buffer zones around the centroids of each survey cluster, following the procedure by Knutsen et al. (2016). Second, since round six contains information from the years 2014 to 2015, we computed mean control shares for each active mine between 2012 and 2015<sup>3</sup> and added up the number of mines per buffer satisfying the majority criterion.

Fig. 1 maps the geographic distribution of the buffer zones and mines. Majority state-owned mines are marked in crosses, while we show internationally owned sites in triangles. In addition, we visualize higher mean female unemployment per buffer in darkening shades, as up to eight respondents share a single georeference. The map illustrates that there is both a substantial spatial overlap in our data, as well as a high degree of variation in unemployment and mine ownership throughout the

<sup>2</sup> We have deliberately chosen round six because our data on mining control rights cover the period 1997–2015.

<sup>3</sup> We check the robustness of our results using different time spans (5- and 6-years periods) when calculating the number of active mines within buffer zones. All results remain qualitatively unchanged.

continent. *Female* and *male unemployment* are dichotomous variables, taking the value 1 whenever respondents report to be unemployed and actively looking for a job.<sup>4</sup> Since unemployment and mining control rights may be jointly influenced by a range of other factors, we control for several other variables in our models. We include a dichotomous measure depicting whether the EA is located in a rural or an urban area. Moreover, we control for whether respondents often feared crime in their homes, have completed at least secondary education, believe that the corruption among local government officials is high<sup>5</sup> and perceive their current living conditions as being good.<sup>6</sup> To reflect the influence of discriminatory policies, we incorporate an indicator conveying individual perceptions of unfair group treatment by the government. Finally, we also enclose a control for the level of infrastructure and state capacity that we proxy by respondents' access to electricity.

In addition to using information from Afrobarometer, we also rely on detailed survey data on employment status, type of work (e.g. whether women are self-employed in agriculture or work in services) and different types of domestic violence from the Demographic Health Survey. We constructed a time-series cross-sectional dataset from 52 different DHS surveys on the district level of analysis. Since DHS sampling procedures ensure representativeness at subnational levels, we generated a disaggregated dataset considering countries that underwent at least two survey waves between 1997 and 2015 and for which the geo-location of respondents was available. Applying this benchmark, we were able to include 21 sub-Saharan countries.<sup>7</sup>

For each district-year we compute the proportion of DHS respondents reporting to be unemployed. In order to test the plausibility of the suggested mechanisms, we also make use of DHS information of whether women are self-employed in agriculture or in services. We further include a number of control variables that may jointly affect employment status and the location and/or control rights of mines: the share of the population that completed higher education (*Higher education*), respondents' economic situation measured by the wealth index from DHS (*Wealth*) and the share of the population working in the skilled manual labor sector as a proxy for industrialization (*Skilled labor*).

As the gender-specific impact of mineral control rights on unemployment may have far-reaching consequences for gender hierarchies and domestic violence, we

---

<sup>4</sup> This variable is based on the question "Do you have a job that pays a cash income? If yes, is it full-time or part-time? If no, are you presently looking for a job?" Note that Afrobarometer also asks individuals whether they are unemployed and not actively looking for a job (which is commonly the case for e.g. housewives or women working in subsistence farming).

<sup>5</sup> The dummy variable *corruption* equals 1 if the interviewee thinks that most or all of local government councilors are corrupt.

<sup>6</sup> The variable *living conditions* equals 1 if respondents consider their current living conditions as being better or much better than the conditions of others in their country.

<sup>7</sup> The district information was assigned to the coordinates of each survey cluster using GIS software and spatial data from the Global Administrative Unit Layers (GAUL). Following the strategy of Fjelde and Østby (2014), we matched the coordinates from DHS survey clusters with district information from GAUL polygons using the software QGIS. The district information was then assigned to surveyed households through the DHS cluster identifier variable.

also make use of various indicators of gender inequality and domestic abuse provided by the DHS.<sup>8</sup> For each district-year we computed the proportion of DHS female respondents reporting that they have ever been insulted or been made feel bad by husband and partner (*Insulted*). In addition, we test the effect of different mineral ownership structures on the share of women reporting to have been punched by fist, or hit by something harmful by husband/partner (*Punched*) per district. When assessing the effect of mining on domestic violence, we control for women's economic situation by using the wealth index (*Wealth*), the share of women having completed higher education (*Higher education*), the share of Muslim and Christian women within each district (*Muslim*, *Christian*) as well as the percentage of respondents per district reporting that decisions about how to spend the husband's income is done jointly among partners (*Joint spending decision*) as a proxy for gender equality. We linearly interpolate the values for years in which DHS surveys were not conducted.

#### 4 Estimation technique and results

In estimating the district-level effects of mines on local unemployment among women and men we fit a panel regression with the following components:

$$U_{d,t} = \beta_0 + \beta_1 * \text{International Mines}_{d,t} + \beta_2 * \text{Domestic Mines}_{d,t} \\ + \beta_3 * X_{d,t} + \beta_4 * \text{Mean}_{d,t} + \varepsilon_{d,t}$$

$U_{d,t}$  indicates the percentage of unemployed residents in district  $d$  at time  $t$ . The independent variables *International Mines*, and *Domestic Mines* depict the number of differently controlled mines in district  $d$  at time  $t$ .  $X_{d,t}$  incorporates a battery of control variables,  $\text{Mean}_{d,t}$  constitutes district-means of the explanatory variable and  $\varepsilon_{d,t}$  is the error term. As our dependent variables (share of unemployment, women working self-employed in agriculture and services) are continuous bounded response variables with values ranging from 0 and 1 and show skewed distribution we do not opt for a linear estimator (Papke and Wooldridge 2008, p. 122). Instead, we fit the regression equation above using a pooled fractional logit model with a logit link and assuming a binomial distribution of the dependent variables and optimized using maximum likelihood. Following the recommendations of Papke and Wooldridge (2008), the panel structure of the data is modelled by including district-means of the explanatory variables. As a robustness check, we also report findings from linear fixed-effects models in the online appendix. We furthermore tested if our findings are robust to the exclusion of Ghana and Zambia, to evaluate if they are driven by the countries with the largest number of mining projects. Similarly, we tested if our results change if countries with no mineral extraction are excluded from the sample. Our findings remain virtually unchanged.<sup>9</sup>

<sup>8</sup> These kinds of measures were not collected by Afrobarometer.

<sup>9</sup> These tables are available upon request.

For the geographically disaggregated effects of mines on Afrobarometer respondents' employment status we fit the logistic regression below:

$$U_i = \beta_0 + \beta_1 * \text{International Mines}_i + \beta_2 * \text{Public} - \text{Domestic Mines}_i + \beta_3 * X_i + \eta_c + \varepsilon_i$$

$U_i$  reports the employment status of individual  $i$ . *International Mines* and *Public-Domestic Mines* each total the number of mining facilities that are operated by the relevant type of company in buffers around individual  $i$ .  $X_i$  denotes a vector of control variables referring to individual  $i$ . With  $\eta_c$  we additionally control for country-fixed effects, and  $\varepsilon$  is the error term. As observations within the same country are unlikely to be independent, we use standard errors clustered around countries in all reported models. In both equations the main coefficient of interest  $\beta_1$  estimates the association between international mineral exploitation and local unemployment.

We start our econometric analysis by assessing the impact of mineral extraction on female and male unemployment irrespective of mining control rights patterns<sup>10</sup>. Table 1 below shows the average marginal effects obtained from the fractional logit regressions fitted on the DHS time-series cross-sectional data. As observable from models 1 to 6, the effect of mining on employment seems ownership- and gender-specific. Only domestic mines are capable of reducing unemployment among men and women (models 3 to 6). At the same time, international mines increase female unemployment substantially (models 5 and 6). Putting the size of these coefficients into perspective: the average district in the sample has an unemployment level of 25.8%. In comparison to this overall mean, the average female unemployment rate is considerably higher, reaching 31.3%—while male unemployment averages at a much lower 20.6% in a district.<sup>11</sup> For female unemployment (Model 6), the coefficient for domestic mines signifies that on average, increasing domestic mining presence by one percentage point will decrease female unemployment by 0.038%. Scaling up multinational mines up by one percentage point by contrast further deteriorates women's unemployment rate by 0.112% on average (Model 6).

As established by the full Model 4, only larger numbers of domestically owned mines likewise decrease the unemployment rate of men. In absolute terms, the coefficient of domestic mines is stronger for male than for female unemployment: Intensifying domestic mining in a district by a marginal one percentage point lowers men's unemployment by 0.042% on average.

Regarding the effect of control variables, we find larger population-shares with completed higher education and districts showing more gender equality (as proxied by joint decision to spend husband's money) to consistently reduce unemployment. The finding that districts with higher wealth are positively associated with unem-

<sup>10</sup> The appendix provides an overview of distribution of the independent mine ownership variables. Out of 4388 sampled DHS districts, only a limited number has hosted mining activities during the period under consideration. The majority of the mines in our sample are internationally controlled. Furthermore, most respondents only experience the impact of one mine in their district.

<sup>11</sup> When calculating averages for only those observations that are non-missing in model 4 and 6, these percentages are slightly higher.

**Table 1** Average marginal effect of mineral control rights on overall, male and female unemployment per district, using DHS-data

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
	Unemployed all	Unemployed all	Unemployed male	Unemployed male	Unemployed female	Unemployed female
International mines	0.000598** (0.000263)	0.00112** (0.000500)	-3.82e-05 (0.000211)	-0.000213 (0.000347)	0.00112*** (0.000288)	0.00101** (0.000453)
Domestic mines	-0.000163* (8.52e-05)	-0.000276** (0.000127)	-0.000261*** (7.53e-05)	-0.000425*** (8.16e-05)	-0.000487*** (0.000126)	-0.000387** (0.000155)
Skilled labor		-0.00350 (0.00333)		-0.0136*** (0.00293)		0.00108 (0.00220)
Higher education		-0.0151*** (0.00202)		-0.00627*** (0.00215)		-0.0153*** (0.00170)
Joint spending decision		-0.0379*** (0.00585)		-0.0483*** (0.00620)		-0.0245*** (0.00544)
Wealth		0.167*** (0.0128)		0.115*** (0.0143)		0.133*** (0.0127)
Observations	20,214	11,864	21,086	13,284	25,570	15,457

Fractional pooled logistic regressions with district-fixed effects and unemployment rate as dependent variable. Robust standard errors in parentheses  
 \*\*\* $p < 0.01$ , \*\* $p < 0.05$ , \* $p < 0.1$

**Table 2** Average marginal effect of mineral control rights on female sectoral occupation per district, using DHS-data

VARIABLES	(1)	(2)	(3)	(4)
	Agriculture	Agriculture	Services	Services
International mines	-0.00284*** (0.000644)	-0.00178*** (0.000552)	0.000331** (0.000160)	0.000512** (0.000221)
Domestic mines	-0.000140 (0.000160)	0.000148 (0.000269)	-0.000132*** (3.36e-05)	0.000108* (5.72e-05)
Higher education		-0.0137*** (0.00195)		0.00331*** (0.000954)
Skilled labor		-0.0256*** (0.00246)		-0.00505*** (0.000849)
Wealth		0.00636*** (0.00133)		-0.000585*** (0.000145)
Electricity		-0.0162*** (0.00414)		0.0176*** (0.00243)
Observations	19,097	11,880	19,097	11,880

Fractional pooled logistic regressions with district-fixed effects and share of women working in agricultural and service sectors as dependent variable. Robust standard errors in parentheses

\*\*\* $p < 0.01$ , \*\* $p < 0.05$ , \* $p < 0.1$

ployment appears counterintuitive at first sight. Yet, unemployment will be larger in the more developed regions as these areas attract the more productive firms that constitute the formal sector of the economy (Galdino et al. 2018, p. 237).

Do international mining firms also induce a shift in the female labor market as hypothesized in the theoretical section? Models 1 to 4 of Table 2 show that, in fact, the share of women self-employed in agriculture is significantly lower in districts hosting international mining firms while the percentage of female participation in the service sector is higher in these areas. On average, a marginal one percentage point increase in multinational mining presence reduces the share of female self-employed farmers by 0.178%. This same change, in turn, is associated with an additional 0.051% of women working in the service sector.

In sum, districts where domestic mining companies operate are thus estimated to enjoy a lower male and female unemployment rate. Internationally controlled mining, in contrast, increases female unemployment. Moreover, international mining prompts a structural shift in the female labor market: women living in districts hosting internationally controlled mines migrate from subsistence farming to the service sector. Similar findings can be reported when fixed effects models are estimated (see Tables A4 and A5 in the online appendix). Thus, we find consistent evidence for hypotheses H1–H3.

Having reported the results for our time-series cross-sectional estimations employing DHS data, we now check the robustness of our findings on the ownership-employment nexus using an alternative empirical strategy and relying on a different data source. As previously noted, we calculate logistic regressions with country dummies employing cross-sectional data from round six of Afrobarometer. Our independent variable of interest is the number of mines within a radius of 25 or 50 km



from each single respondent. We thereby directly compare respondents living in the proximity to operating mines with interviewees living more than 25 or 50km away from any mine.

In line with previous findings from Kotsadam and Tolonen (2016), our results summarized by Table 3 below indicate that the effect of mineral extraction on local employment is gender-specific. While mining seems to have no overall effect on local unemployment rates (Model 2), it tendentially decreases unemployment among men (models 3 and 4) and increases the probability of women reporting to be unemployed (models 5 and 6). Note that the overall effect of increasing the number of mines in the buffer zone on unemployment—irrespective of gender—is non-significant (Model 2). Most of the control variables are in line with our expectations. While respondents enjoying a better economic situation as well as access to electricity have a reduced unemployment risk, interviewees who experience higher criminality are more likely to suffer from unemployment (Model 2). All remaining control variables are not statistically significant. Table A6 in the appendix repeats the estimations using 25 km buffer zones. It is striking that, using narrower buffers, the main results reported above become non-significant. This may have two major reasons. It may be indicative that domestic mining companies may rather reduce male employment by promoting spillovers to a broader region around mines (instead of through direct employment). Moreover, models using 25 km buffer zones may lack statistical power, as matchings between Afrobarometer' respondents and mines become less likely.

In a second step, we test our core claim that the impact of mineral extraction on employment rates is not only gender-specific but also dependent on the governance structure of the operating mining company. As shown by Table 4, it indeed seems to matter whether men and women live close to a predominantly domestic firm or a foreign multinational company. Model 3 and 4 show that living close to domestically-controlled mining firms significantly reduces unemployment among men. In contrast, the odds for a woman to experience unemployment are estimated to increase by each internationally-owned firm in a woman's proximity (models 5 and 6). While the odds of reporting to be unemployed increase by around three percent with each additional internationally-controlled mine for women, they decrease by around 1.11% with each additional domestically owned mine for the male population. The negative effect of domestic mines on male employment remains significant when 25km buffer zones are used (model 4 of Table A7). However, the positive impact of multinational mining firms on female employment vanishes (model 6).

The reported findings suggest that natural resource ownership structures need to be taken more seriously when assessing gender-based labor market inequalities induced by extractive industries. Our findings indicate that the relationship between resource extraction and unemployment is moderated by resource control rights regimes. While domestic mining companies seem to employ a large share of men within extractive communities, multinational mining firms do not reduce unemployment rates among the local male population. At the same time, international companies increase the share of women actively looking for a job and shift female employment from subsistence farming to the service sector. As we show next, this also has implications for gender hierarchies and the incidence of domestic violence. While domestic controlled mining seems to reproduce the male breadwinner model,

**Table 3** Effect of mining on overall, male and female unemployment, using afrobarometer-data and 50 km buffers

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
	Unemployed all	Unemployed all	Unemployed male	Unemployed male	Unemployed female	Unemployed female
Mines	0.00146 (0.00640)	0.00292 (0.00612)	-0.0139** (0.00621)	-0.0117* (0.00622)	0.0150** (0.00756)	0.0159** (0.00676)
Living conditions		-0.196*** (0.0502)		-0.202*** (0.0593)		-0.194*** (0.0563)
Secondary Education		0.0461 (0.0922)		-0.00243 (0.102)		0.118 (0.0996)
Urban area		-0.0500 (0.0964)		-0.0466 (0.0962)		-0.0522 (0.116)
Discrimination		0.0950 (0.0672)		0.145* (0.0789)		0.0543 (0.0676)
Crime		0.0818** (0.0417)		0.0708* (0.0414)		0.0867 (0.0656)
Local corruption		0.0446 (0.0345)		0.0696 (0.0452)		0.0163 (0.0465)
Local state capacity		-0.162*** (0.0623)		-0.263*** (0.0673)		-0.0716 (0.0676)
Constant	-2.070*** (3.82e-10)	-1.788*** (0.121)	-1.957*** (4.98e-10)	-1.557*** (0.128)	-2.194*** (1.58e-08)	-2.053*** (0.139)
Observations	53,691	36,782	26,692	18,714	26,998	18,067
Pseudo R-squared	0.0517	0.0482	0.0545	0.0538	0.0544	0.0491
Country-dummies	Yes	Yes	Yes	Yes	Yes	Yes

Logistic regressions with country dummies and unemployment as dependent variable

Standard errors clustered at country-level in parentheses

\*\*\* $p < 0.01$ , \*\* $p < 0.05$ , \* $p < 0.1$

**Table 4** Effect of mineral control rights on overall, male and female unemployment, using afrobarometer-data and 50km Buffers

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
	Unemployed all	Unemployed all	Unemployed male	Unemployed male	Unemployed female	Unemployed female
International mines	0.0207** (0.0102)	0.0232* (0.0120)	0.0157** (0.00680)	0.0174* (0.00985)	0.0268* (0.0162)	0.0306** (0.0154)
Domestic mines	-0.0521** (0.0232)	-0.0498** (0.0214)	-0.105*** (0.0332)	-0.0965*** (0.0274)	-0.0123 (0.0235)	-0.0151 (0.0215)
Living conditions		-0.195*** (0.0498)		-0.200*** (0.0591)		-0.193*** (0.0559)
Secondary education		0.0455 (0.0920)		-0.00313 (0.102)		0.117 (0.0993)
Urban area		-0.0470 (0.0961)		-0.0420 (0.0961)		-0.0504 (0.116)
Discrimination		0.0929 (0.0683)		0.141* (0.0807)		0.0539 (0.0681)
Crime		0.0829** (0.0417)		0.0735* (0.0408)		0.0870 (0.0656)
Local corruption		0.0450 (0.0341)		0.0712 (0.0443)		0.0156 (0.0463)
Local state capacity		-0.164*** (0.0619)		-0.266*** (0.0673)		-0.0729 (0.0670)
Constant	-2.070*** (3.82e-10)	-1.789*** (0.119)	-1.957*** (4.98e-10)	-1.559*** (0.126)	-2.194*** (1.58e-08)	-2.053*** (0.138)
Observations	53,691	36,782	26,692	18,714	26,998	18,067
Pseudo R-squared	0.0518	0.0484	0.0550	0.0543	0.0544	0.0493
Country-dummies	Yes	Yes	Yes	Yes	Yes	Yes

Logistic regressions with country dummies and unemployment as dependent variable  
 Standard errors clustered at country-level in parentheses  
 \*\*\* $p < 0.01$ , \*\* $p < 0.05$ , \* $p < 0.1$

**Table 5** Average marginal effect of mineral control rights on women per district being insulted, using DHS-data

VARIABLES	(1)	(2)	(3)	(4)
	Insulted	Insulted	Insulted	Insulted
International mines	-0.00176*** (0.000532)	-0.00289*** (0.000675)	-0.00288*** (0.000645)	-0.00298*** (0.000633)
Domestic mines	-0.00107*** (0.000248)	1.15e-05 (0.000119)	2.25e-05 (0.000121)	-1.10e-05 (0.000107)
Higher education		-0.00951** (0.00374)	-0.00914** (0.00355)	-0.00919** (0.00378)
Wealth		0.0632*** (0.0171)	0.0657*** (0.0170)	0.0702*** (0.0170)
Joint spending decision		-0.0329*** (0.00712)	-0.0323*** (0.00696)	-0.0278*** (0.00711)
Muslim		-0.0101*** (0.00259)	-0.0104*** (0.00268)	-0.00908*** (0.00264)
Christian		-0.00122 (0.00985)	-0.00138 (0.0101)	0.0110 (0.0105)
Agriculture			0.00441 (0.00480) (0.00642)	
Services				-0.00796*** (0.00181)
Observations	15,449	6455	6455	6455

Fractional pooled logistic regressions with district-fixed effects and share of women being insulted as dependent variable. Robust standard errors in parentheses

\*\*\* $p < 0.01$ , \*\* $p < 0.05$ , \* $p < 0.1$

international mining companies may indirectly contribute to women's empowerment by inducing structural labor market shifts.

Tables 5 and 6 below show that in particular the presence of international mining companies seems to reduce domestic abuse as proxied by the share among women per district that indicate in the DHS survey to have been frequently insulted or punched by their intimate partner. On average, the percentage of women per district reporting to have been insulted by intimate partners in the recent past lies at 22.8%. In the full model 2 of Table 5, a marginal one percentage point increase of multinational mining presence diminishes the share of women suffering from such verbal abuse by 0.289% on average. Physical abuse by partners with punches has occurred to 11.3% of all women in the sample. In this case, a marginal one percentage point rise in international mining reduces the share of women being punched by 0.131% in model 2 of Table 6. Domestic mining firms, in contrast, have no significant effect on intimate partner violence in the full models of both tables. To test our underlying assumption that the shift of female labor from subsistence farming to the service sector may explain the reduction of domestic violence within districts hosting international mining sites, we include the share of women self-employed in farming and working in the service sector as control variables. As observable in

**Table 6** Average marginal effect of mineral control rights on women per district being punched, using DHS-data

VARIABLES	(1) Punched	(2) Punched	(3) Punched	(4) Punched
International mines	-0.000628** (0.000280)	-0.00131*** (0.000276)	-0.00127*** (0.000317)	-0.00141*** (0.000261)
Domestic mines	-0.000265** (0.000128)	-5.62e-05 (8.83e-05)	2.05e-05 (9.18e-05)	-7.42e-05 (8.33e-05)
Higher education		-0.00993*** (0.00149)	-0.00803*** (0.00138)	-0.00972*** (0.00147)
Wealth		-0.00288 (0.0127)	0.0172 (0.0124)	0.00258 (0.0127)
Joint spending decision		-0.0256*** (0.00548)	-0.0227*** (0.00540)	-0.0218*** (0.00552)
Muslim		0.00418*** (0.00153)	0.00407*** (0.00157)	0.00536*** (0.00162)
Christian		0.00336 (0.00813)	0.0116 (0.00803)	0.0144* (0.00855)
Agriculture			0.0341*** (0.00432) (0.00533)	
Services				-0.00567*** (0.000956)
Observations	18,418	6491	6491	6491

Fractional pooled logistic regressions with district-fixed effects and share of women being punched as dependent variable. Robust standard errors in parentheses

\*\*\* $p < 0.01$ , \*\* $p < 0.05$ , \* $p < 0.1$

model 4 of Tables 5 and 6, female labor market participation in the service sector seems to significantly reduce the percentage of being insulted or punched within districts. In contrast, model 3 of Table 6 shows that women working as self-employed farmers are more frequently punched. Note, however, that the coefficient of international mining remains negative and significant after the introduction of these two control variables. Thus, it seems that—apart from prompting a structural labor market shift—internationally controlled mines affect domestic violence through an additional channel not accounted for in this paper. Future research specifying and testing the mechanisms linking mining, labor market outcomes and intimate partner violence seems warranted. All results reported above remain qualitatively unchanged when using linear fixed effects (see Tables A8 and A9 of the web appendix).

In sum, we find evidence that the presence of international firms extracting mineral resources may contribute to women’s emancipation and reduce intimate partner violence. The potential reduction of gender wage gaps and female empowerment as a direct consequence of a structural labor market shift seems to prevail over other channels linked to unfavorable sex ratios or the described backlash as well as relative resource theory.

## 5 Conclusion

The gendered aspects of the resource curse have received increased attention in recent years. In this article, we have provided a theoretical framework that relates two negative effects for females of resource abundance—increased unemployment and a growing risk of interpersonal violence—to the ownership arrangements of mines. Our empirical analysis shows that the effect of internationally controlled mines may be a blessing and a curse at the same time. Our results indicate that regions in which mines are predominantly owned internationally experience higher male and female unemployment. At the same time, international mining companies seem to trigger a structural shift in the female labor market and an overall empowerment of women. Female employment in agriculture shrinks around international mines, but grows in the service sector. According to our argumentation, this divergence has direct consequences for regional domestic violence. Employment in the service sector empowers women and accounts for the reduced risk for them to experience violence from their partners. We notably observe a smaller exposure to insults and a reduced risk for being punched for females who live close to international mines.

Our article thus qualifies the literature on the resource curse in at least three different ways. First, we develop a micro-level theory that centers on the decision making of the crucial actors in this domain—employers, the employed and unemployed female workers, as well as their partners. The theory predicts that international ownership in the mining sector disrupts traditional gender roles. The empirical analysis confirms that different mineral ownership patterns have different gender-specific effects on local employment levels and consequently different impacts on domestic violence. Thus, our article adds to the emerging literature that sees ownership arrangements as one of the crucial mechanisms through which resource abundance can be meaningfully linked to a diverse set of social and economic ills. Second, we contend that these findings provide an important stepping stone in the development of individual level motivations to join a rebellion. As the job market situation around an internationally owned mine worsens, working in the informal sector of the economy or joining a rebel organization become more attractive. This further confirms the finding that state repression is higher close to international in comparison to national mines (Wegenast and Schneider 2017). In addition to this, the increased levels of interpersonal violence in these regions diminishes the inhibition towards the usage of force in general. Third, by taking a disaggregated view, we demonstrate that the often inconclusive results of research on the resource curse might be due to the aggregation bias of most studies in which country- or dyad-years are juxtaposed. Such analyses typically oversee the large intra-country variance that exist in the ownership arrangement with a country's mining sector.

A further factor that has received only scant attention in the literature so far are the costs associated with resource extraction. If a certain resource is to be unearthed from a particular site, the investment costs might exceed the financial opportunities of the country or region in which the mine will eventually be situated. To test this relationship convincingly, we would need detailed information on how large the investments would have to be and where the real and potential mines can be found. Future work might show that the negative aspects of international ownership of

mines partly depend on the investment needs for an extraction site. Such a result would, however, not weaken the responsibility that international investors have in mining regions. As this article has shown, international mining companies do not sufficiently live up to their obligations to further female empowerment.

**Acknowledgements** We would like to thank the editorial team of ZeFKo, guest editor Nils Weidmann and two anonymous reviewers for their guidance and comments on earlier versions of the article.

**Funding** Financial support from the German Research Foundation (DFG), as part of the research project "Resource Management and Intrastate Conflict" (WE 4850/1-2), is gratefully acknowledged.

## References

- Adeyuyi, Adeolu O., T. Ademola Oyejide, (2012) Determinants of backward linkages of oil and gas industry in the Nigerian economy. *Resources Policy* 37(4):452–460
- Aizer, Anna. 2010. The gender wage gap and domestic violence. *American Economic Review* 100:1847–1859.
- Amendolagine, Vito, Amadou Boly, Nicola Daniele Coniglio, Francesco Prota, and Adnan Seric. 2013. FDI and local linkages in developing countries: Evidence from sub-Saharan Africa. *World Development* 50:41–56.
- Aragón, Fernando M., and Juan Pablo Rud. 2016. Polluting industries and agricultural productivity. Evidence from mining in Ghana. *Economic Journal* 126:1980–2011.
- Atkinson, Maxine P., Theodore N. Greenstein, and Molly Lang Monahan. 2005. For women, breadwinning can be dangerous. Gendered resource theory and wife abuse. *Journal of Marriage and Family* 67:1137–1148.
- Bagshaw, Eryk. 2017. The Australian companies mining \$40 billion out of Africa. The Sydney Morning Herald. <https://www.smh.com.au/politics/federal/the-australian-companies-mining-40-billion-out-of-africa-20170906-gyc6t0.html>. Accessed 25 June 2018.
- Bebbington, Anthony, Denise Humphreys Bebbington, Jeffrey Bury, Jeannet Lingan, Juan Pablo Muñoz, and Martin Scurrah. 2008. Mining and social movements. Struggles over livelihood and rural territorial development in the Andes. *World Development* 36:2888–2905.
- Benshaul-Tolonen, Anja. 2018. Endogenous gender norms: evidence from Africa's gold mining industry. *OxCarre Research Paper* (working paper).
- Benshaul-Tolonen, Anja, and Sarah Baum. 2019. *Structural transformation, extractive industries and gender equality*. Working Paper.
- Benshaul-Tolonen, Anja, Putnam Chuhan-Pole, Andres Dabalen, Andreas Kotsadam, and Aly Sanoh. 2019. *The local socioeconomic effects of gold mining: evidence from Ghana*. Working Paper.
- Bhanumathi, K. 2009. The status of women affected by mining in India. In *Tunnel vision, women, mining and communities*, ed. Ingrid MacDonald, Claire Rowland, 20–24. Fitzroy: Oxfam Community Aid Abroad.
- Brain, Kelsey A. 2017. The impacts of mining on livelihoods in the Andes. A critical overview. *Extractive Industries and Society* 4:410–418.
- Bryson, Judy C. 1981. Women and agriculture in sub Saharan Africa. Implications for development (an exploratory study). *Journal of Development Studies* 17:29–46.
- Cane, Isabel, Amgalan Terbish, and Onon Bymbasuren. 2013. *Mapping gender based violence and mining infrastructure in Mongolian mining communities*. International Mining for Development Centre. IM4DC Action Research Final Report.
- Choi, Susanne Y.P., and Kwok-Fai Ting. 2008. Wife beating in South Africa. An imbalance theory of resources and power. *Journal of Interpersonal Violence* 23:834–852.
- Coderre-Proulx, Mylène, Bonnie Campbel, and Issiaka Mandé. 2016. *International migrant workers in the mining sector*. International Labour Office, Sectoral Policies Department, Conditions of Work and Equality Department. Geneva: ILO.
- Conroy, Amy A. 2014. Marital infidelity and intimate partner violence in rural Malawi. A Dyadic Investigation. *Archives of Sexual Behaviour* 43(7):1303–1314.
- Cools, Sara, and Andreas Kotsadam. 2017. Resources and intimate partner violence in sub-Saharan Africa. *World Development*, 95:211–230.

- D'Alessio, Stewart J., and Lisa Stolzenberg. 2010. The sex ratio and male-on-female intimate partner violence. *Journal of Criminal Justice* 38:555–561.
- Dancygier, Rafaela M., Naoki Egami, Amaney Jamal, and Ramona Rischke. 2019. Hating and mating: fears over mate competition and violent hate crime against refugees. *SSRN* <https://doi.org/10.2139/ssrn.3358780>.
- Eftimie, Adriana, Katherine Heller, and John Strongman. 2009. *Gender dimensions of the extractive industries*. Mining for equity. Working paper, extractive industries and development series #8. Washington D.C: World Bank.
- Eller, Stacy L., Peter R. Hartley, and Kenneth B. Medlock III. 2011. Empirical evidence on the operational efficiency of National Oil Companies. *Empirical Economics* 40:623–643.
- Fessehaie, Judith. 2012. What determines the breadth and depth of Zambia's backward linkages to copper mining? The role of public policy and value chain dynamics. *Resources Policy* 37:443–451.
- Fjelde, Hanne, and Gudrun Østby. 2014. Socioeconomic inequality and communal conflict, A disaggregated analysis of sub-saharan Africa, 1990–2008. *International Interactions* 40:737–762.
- Galdino, Katia M., Moses N. Kiggundu, Carla D. Jones, and Sangbum Ro. 2018. The informal economy in pan-Africa: review of the literature, themes, questions, and directions for management research. *Africa Journal of Management* 4:225–258.
- Goode, William J. 1971. Force and violence in family. *Journal of Marriage and the Family* 30:624–636.
- Gurr, Ted Robert. 1970. *Why men rebel*. Princeton: Princeton University Press.
- Hartley, Peter, and Kenneth B. Medlock III. 2008. A model of the operation and development of a national oil company. *Energy Economics* 30:2459–2485.
- Heath, Rachel. 2014. Women's access to labor market opportunities, control of household resources, and domestic violence: evidence from Bangladesh. *World Development* 57:32–46.
- Hinton, Jennifer J., Barbara E. Hinton, and Marcello M. Veiga. 2006. Women in artisanal and small scale mining in Africa. In *Women miners in developing countries: Pit women and others*, ed. Kuntala Lahiri-Dutt, 209–226.
- Infomine. 2013. Mine sites, Major mining operations around the world. <http://www.infomine.com/minesite/>. Accessed 29 Mar 2018.
- Jenkins, Katy. 2014. Women, mining and development. An emerging research agenda. *Extractive Industries and Society* 1:329–339.
- Knutsen, Carl H., Andreas Kotsadam, Eivind Hammersmark Olsen, and Tore Wig. 2016. Mining and Local Corruption in Africa. *American Journal of Political Science* 61:320–334.
- Kotsadam, Andreas, and Anja Tolonen. 2016. African mining, gender, and local employment. *World Development* 83:325–339.
- La Porta, Rafael, and Florencio López-de-Silanes. 1999. The benefits of privatization, evidence from Mexico. *Quarterly Journal of Economics* 114:1193–1242.
- Lahiri-Dutt, Kuntala. 2006. Mainstreaming gender in the mines. Results from an Indonesian colliery. *Development in Practice* 16:215–221.
- Lucas, Robert. 1987. Emigration to South Africa's Mines. *American Economic Review* 77:313–330.
- Macmillan, Ross, and Rosemary Gartner. 1999. When she brings home the bacon: labour-force participation and the risk of spousal violence against women. *Journal of Marriage and the Family* 61:947–958.
- McCloskey, Laura Ann. 1996. Socioeconomic and coercive power within the family. *Gender and Society* 10:449–463.
- Mohan, Giles. 2013. Beyond the enclave, towards a critical political economy of China and Africa. *Development and Change* 44:1255–1272.
- Morris, Mike, Raphael Kaplinsky, and David Kaplan. 2012. 'One thing leads to another'—commodities, linkages and industrial development. *Resources Policy* 37:408–416.
- Muchadenyika, Davison. 2015. Women struggles and large-scale diamond mining in Marange, Zimbabwe. *The Extractive Industries and Society* 2(4):714–721.
- Mususa, Patience. 2010. Getting by. Life on the Copperbelt after the privatisation of the Zambia Consolidated Copper Mines. *Social Dynamics* 36:380–394.
- Papke, Leslie E., and Jeffrey M. Wooldridge. 2008. Panel data methods for fractional response variables with an application to test pass rates. *Journal of Econometrics* 145:121–133.
- Radtke, K.M., M. Ruf, H.M. Gunter, K. Dohrmann, M. Schauer, A. Meyer, and T. Elbert. 2011. Transgenerational Impact of Intimate Partner Violence on Methylation in the Promoter of the Glucocorticoid Receptor. *Translational Psychiatry* 1:e21.
- Ross, Michael. 2008. Oil, Islam, and women. *American Political Science Review* 102:107–123.
- Ross, Michael. 2012. *The oil curse. How petroleum wealth shapes the development of nations*. Princeton: Princeton University Press.



- Taylor, John. 1990. The reorganization of mine labor recruitment in Southern Africa. Evidence from Botswana. *International Migration Review* 24:250–272.
- Tordo, Silvana, Michael Warner, Osmel Manzano, and Yahya Anouti. 2013. *Local content policies in the oil and gas sector*. Washington, DC: The World Bank.
- True, Jacqui. 2012. *The political economy of violence against women*. Oxford: Oxford University Press.
- UNECA. 2011. *Minerals and Africa's development. The international study group report on Africa's mineral regimes*. Addis Ababa: United Nations Economic Commission for Africa.
- Velásquez, Teresa A. 2012. The science of corporate social responsibility (CSR): contamination and conflict in a mining project in the southern Ecuadorian Andes. *Resources Policy* 37:233–240.
- Victoroff, Jeff, Samir Quota, Janice R. Adelman, Barbara Celinska, Naftali Stern, Rand Wilcox, and Robert M. Sapolsky. 2010. Support for religio-political aggression among teenaged boys in Gaza: Part I: psychological findings. *Aggressive Behavior* 36:219–231.
- Wegenast, Tim, and Gerald Schneider. 2017. Ownership matters: natural resources property rights and social conflict in Sub-Saharan Africa. *Political Geography* 61:110–122.
- Wegenast, Tim, Arpita Khanna and Gerald Schneider. 2019a. *The Micro-Foundations of the Resource Curse: Mineral Ownership and Local Economic Well-Being in Sub-Saharan Africa*. Unpublished Working Paper, University of Konstanz.
- Wegenast, Tim, Mario Krauser, Georg Strüver, and Juliane Giesen. 2019b. At Africa's expense? Disaggregating the employment effects of Chinese mining operations in sub-saharan Africa. *World Development* 118:39–51.
- Wilson, Jeffrey D. 2015. Understanding resource nationalism: economic dynamics and political institutions. *Contemporary Politics* 21:399–416.
- Yyas, Seema, and Charlotte Watts. 2009. How does economic empowerment affect women's risk of intimate partner violence in low and middle income countries? A systematic review of published evidence. *Journal of International Development* 21:577–602.