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Are women neglected in the EU agriculture? Evidence from Lithuanian young farmers

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ABSTRACT
The agriculture in Eastern Europe has seen a number of economic and social transitions. This research examines the gender inequality in agriculture by taking the case of an Eastern European country – Lithuania – as an example. The questionnaire survey was employed in order to check the existence of gender inequality. The study focuses on the young farmers as they are more likely to implement innovations and shape the future agricultural activities. The demand for advisory services and participation in the Common Agricultural Policy measures were used to compare the activities and perceptions of men and women young farmers. We found that there are no significant differences in participation of support measures and demand for advisory services across the genders. This suggests Lithuanian agricultural sector is equally beneficial for men and women young farmers. Given the differences in the educational background, a positive effect is anticipated if women were more empowered in Lithuanian agriculture. Women’s participation in agriculture could increase environmental awareness, propensity to innovate and economic resilience.

1. Introduction
The gender equality is important for ensuring economic development (Kleven and Landais, 2017; Silva Rodríguez de San Miguel, 2019; Matuszewska-Janica, 2018; Gil-Lafuente et al., 2019; Li et al., 2019). Governments are imposing frameworks for ensuring gender equality in order to ensure economic growth (Kennedy, 2018), promote social development (Farre, 2013), improve societal justice (Cornwall and Rivar, 2018), motivate tackling the global issues (Terry, 2009) and facilitate peacemaking (O’Rourke, 2017). In general, North European countries are considered to be an example to follow in the sense of the gender-related issues (Åkeskog, 2017).

In this paper, we seek to address the issue of gender equality in agriculture which involves labor-intensive farming practices and requirements for manpower. We focus on the activities of young farmers as this allows identifying gender equality patterns among the future generations of farmers. The European Union has been supporting the agricultural sector through the Common Agricultural Policy (CAP). The CAP measures also include support for the young farmers. Therefore, we address the gender-public support nexus by considering the CAP measures and young farmers’ intentions in the context of the gender equality. Indeed, there has been research showing that adoption of modern farming practices is more prevalent among women farmers compared to men farmers (Fisher and Kandiwa, 2014; Worku, 2016).

The paper focuses on Lithuania as a case study. The relatively high gender equality level (Blomberg et al., 2017) has been reported for this Eastern European country even though certain limitations of the gender equality indicators have been identified (Broer et al., 2019; Unterhalter and North, 2017; Mwiine, 2019). Agriculture can be seen as a sector with high likelihood of gender inequality (Collins, 2018). The cases of gender inequality in agriculture have occurred in the EU (EIGE, 2015). Still, younger generations are more reluctant to accept discrimination (Sani and Quaranta, 2017). We will verify these findings in the context of Lithuanian agriculture.

The paper is structured as follows: Section 2 provides insights on the reasons of gender inequality in economy and documents women deprivation in agriculture. Section 3 introduces methods employed in the research. Section 4 delivers the empirical findings. The results are available online 10 October 2020
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2. Literature review

2.1. Gender inequality in the economy

The empowerment of women is closely associated with the economic development level of a country (Pickbourn and Ndirikumana, 2016). Padavic et al. (2020) explained the persistence of gender inequality in business organizations and argued that men have more power than women where the family domain is being devalued relative to the work domain. The unconscious acceptance of men’s dominant position in negotiations is documented by Schram et al. (2019), showing tendency to associate a higher status with men, compared to women, in negotiations, thus diminishing their bargaining position and possibilities to achieve the same results.

The prevailing theoretical stream associates wage gap existing between men and women to the motherhood penalty (Ji et al., 2017). Although the link between education levels, fertility rates and gender inequality is quite often stressed (Malhotra et al., 1995; Karoui and Feki, 2018; Reay, 2018), Brinton et al. (2018) challenged the inverse relationship between fertility rates and gender equality by embarking on the example of Japan, where high women’s education levels are complemented with low birth rates and high gender inequality. This was also confirmed by Yoon (2016) for the case of South Korea.

Hakura et al. (2016) stated that governments are partly responsible for gender inequality through implementation of gender-irrelevant fiscal policies that strengthen dominant men’s positions and deepens obstacles for women to acquire education and production factors. This has also been stressed by Andonova (2018). The indifference to this issue is even observed in the developed countries (Heise et al., 2019). Gender inequality in mobility (Adeel et al., 2017) implies that women are less mobile by all means of transportation (because of personal security, home responsibilities) and leads to lower income. This can be offset by remote work practices (Cama et al., 2016; Lorz and Mühleck, 2019). The educational differences associated with genders are important in this context as home office jobs require higher skills in general (Castilla et al., 2018). Dili and Westerhuis (2018) found that higher representation of women in tertiary education positively correlates with their entrepreneurial activities, thus confirming the hypothesis about importance of education in assuring economic empowerment of women.

Niederle (2017) explained lower women’s economic engagement by considering the psychological attributes, particularly reluctance to enter competitions. Perugini and Vladislavliev (2019) argued that high gender inequality leads to higher job satisfaction in later stages of life, through lower expectations to salary and working conditions. Although high job satisfaction may appear appealing, such women’s reconciliation with the existing conditions may also prevent them for seeking better job positions and damper gender equality. Bastian et al. (2019) identified religion as one of the predominant factors for gender inequality in economy, especially in Islamic countries. Bosch et al. (2018) put emphasis on early education in families in explaining motivation of women to be fully engaged in work, which, in turn, is being reflected by significant wage gap (Herzberg-Druker and Stier, 2019).

Although women tend to outnumber men in numbers of university graduates in modern countries (Davia et al., 2017), the wage gap still persists as women tend to choose professions that are typically lower remunerated (Stier and Herzberg-Druker, 2017). Klevn et al. (2019) decomposed the pay gap with regards to the arrival of children. The asymmetric supply of labor force is the focal point in explanation of the wage gap by Sorenson and Dahl (2016). Fernandez-Mateo and Fernandez-Mateo (2016) also addressed supply shortages in explaining low number of female executives.

2.2. The role of women in agriculture

The roots of gender difference in agriculture has been documented since the 19th century (Llorca-Jana et al., 2019). Anderson et al. (2017) found that authority in making farming decisions in family farms lay on a husband and wife is stripped of possibility of any discretion unless allowed by husband. Young females in rural regions do not seek to pursue a career in agriculture considering it a men’s domain (Elias et al., 2018). Women’s work in agriculture is being undervalued or even neglected, compared to men’s (Dracea and Peveri, 2018). This is particularly characteristic to family farms (Savran et al., 2016). The socially neglected role of women in agriculture is also documented by Gallo et al. (2013).

In developing countries, gender inequality in agricultural activities may even lead to malnutrition (Malapit and Quisumbing, 2015). High gender differences in food insecurity among family farms members was also observed by Tiesi and Visser (2016). These issues can be mitigated by increasing women’s education or land property rights (Palacios-Lopez et al., 2015), although it is very hard to achieve due to the traditional men’s domination (Meinen-Dick et al., 2019) as women are less likely to hold land property rights and their holdings are substantially lower, compared to men (Lambrecht et al., 2018). Rao (2016) showed that women, compared to men, have significantly lower access to all agricultural production factors. This serves as a reason for abandoning the farming (Pattnaik et al., 2018). The deprivation of women agricultural production factors complemented by power relations, habitual to agricultural activities make female farmers more vulnerable to consequences of the climate change (Ylipa et al., 2019). Conversely, empowered women show high adaptive capacity to deal with climate change issues (Jost et al., 2016) and productivity levels about or above average (de la O Campos et al., 2016).

The positive link between women’s empowerment in agriculture and their dietary quality was confirmed by Sraboni and Quisumbing (2018); Rao et al. (2019). Emmanuel et al. (2016) document significant differences between men and women in access to agricultural extension services. The low level of women empowerment is considered a precondition for a slow adoption of conservation agriculture practices (Farnworth et al., 2016). In this regard, sustainable agricultural development may be hindered by gender inequality. Agarwal (2018) argued that women are more flexible in adopting various forms of cooperation, such as pooling resources, labor force sharing.

Significant gender differences exist in compensation for agricultural work (Pannilage, 2017) due to institutional and norm-based constraints (Croppenstedt et al., 2013). Mukhamedova and Wegerich (2018) found that the only feasible way for women to get more involved in agriculture is through replacing men who left farming and only in the presence of the lack of men labor force. In this case, women still have lower protection, security and earnings compared to men. The vulnerability of women’s agricultural income, compared to men’s, is stressed by Mukhamedova (2018) attributing this phenomenon to the influence of social norms and amplified by agricultural trade liberalization. The division of labor attributing low value added agricultural jobs to women and high value added to men is seen as a main factor in a wage gap, though unlikely be challenged due to prevailing patriarchy thinking in rural regions (Manzanera-Ruiz et al., 2016). Gupta et al. (2017) documented that women tend to increase market orientation of farms, thus
allowing receiving fairer price for their production. The commercialization of agriculture is seen as one of possible tools for promoting gender equality by Aregu et al. (2010).

Women farmers face bigger difficulties in obtaining financial capital for modernization of their farms (Huyer, 2016). It is even found that the only feasible way for woman in Deep South to apply for loans in agriculture is through the marriage certificate (Lawry et al., 2017). Gender gap is observed between male and female farmers in access to agricultural knowledge (Zossou et al., 2017) and training (Mudege et al., 2017). It is also considered to be an obstacle in successful implementation of climate-smart agriculture practices (Nelson and Huyer, 2016).

Government initiatives in mainstreaming gender policies are less effective in agriculture (Acosta et al., 2019). Women continue to experience information asymmetry in advisory services provided (Kristianson et al., 2017; Kansiime et al., 2019) even though they require it in a higher extent (Hellin and Fisher, 2016). The general agricultural information is harder to obtain for women (Lamontagne-Godwin et al., 2018; Beaman and Dillon, 2018).

In the Eastern Europe, the agricultural sector is more developed that it is the case in most of the developing countries. Therefore, we do not expect such decisive differences between men and women farmers. However, the earlier literature suggests that there may be certain differences in the propensity to innovate and adopt sustainable technologies across the genders.

3. Methods

The survey based upon structured questionnaire is the major instrument of the analysis. The survey focused on the young farmers who, in the European Union, are persons up to 40 years old (European Commission, 2016). The questionnaire for young farmers was designed in a way which enabled to evaluate the social, business management and support management characteristics across the genders. Table 1 presents the major variables that were used for assessing the gender-wise differences among Lithuanian young farmers.

The present study aims at identifying the possible gender-wise differences in the farming practices and participation of agricultural support measures. Therefore, statistical tests (t-test and chi-square test) are applied to contrast the two groups of respondents. This allows testing whether the observed differences are significant.

The data were collected by organizing a questionnaire survey in the agricultural departments of the municipalities across different regions of Lithuania. The survey resulted in 473 completely filled-up questionnaires which were used for further analysis (Balezentis et al., 2020). The owners of farms participated in the survey.

4. Results

The survey focuses on the demographic characteristics of the respondents, their participation on the support schemes for the young farmers and the use of the advisory services. In this study, we take the gender as the explanatory variable in order to ascertain whether gender-based differences exist in the aforementioned aspects of the operation of the young farmers (Table 2).

The share of women farm owners is 19 % in the sample analysed. This suggests that the women farmers are still much less frequent among the young farmers in Lithuania. Indeed, a substantial share of women may be engaged in farming in Lithuania, yet the farm owners are men in most cases. The area of residence (rural against non-rural) does not significantly differ across the genders. This indicates that both men and women young farmers are likely to reside on-farm (80 % of the respondents). This finding corroborates the suitability of the rural infrastructure for the women needs in Lithuania.

The share of the young farmers with higher education degree significantly differs across the genders. Specifically, 76 % of the female respondents reported holding a higher education degree, whereas the corresponding figure for the male respondents is just 56 %. This difference is significant (p < 0.01). Therefore, one can presume that Lithuanian young women farmers are more educated than the men farmers which may result in better adoption of the modern farming and marketing practices.

Farm characteristics do not differ significantly across the genders. The average farm size (in terms of the utilized agricultural area) is 70 ha and 78 ha for the female and male young farmers respectively. Even though the male young farmers seem to operate larger farms, the t-test does not show significance difference. As regards the farming type, female young farmers seem to be engaged in the mixed farmer to a higher extent (43 % of the total female young farmers) than the male young farmers. Women young farmers are likely to reside on-farm (80 % of the respondents). This suggests that the women farmers are still much less frequent among the young farmers in Lithuania. Indeed, a substantial share of women continue to experience information asymmetry in advisory services provided (Kristianson et al., 2017; Kansiime et al., 2019) even though they require it in a higher extent (Hellin and Fisher, 2016). The general agricultural information is harder to obtain for women (Lamontagne-Godwin et al., 2018; Beaman and Dillon, 2018).

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Women young farmers in Lithuania at a 10% level. However, the share do (11 % against 6%). Also, female farmers reported lower interest in the support payments. The results are presented in Table 5. Again, there are no significance differences between the preferences of men and women young farmers. The women young farmers are also more prone to switch to alternative to agriculture activities than men farmers. This may indicate a lack of seed capital for the female young farmers. Hence, they were asked to identify the key topics tailored to correspond to the needs of the young women farmers in Lithuania.

Some 44 % of the respondents stated that they had received support for setting up a farm. This suggests that the majority of young farmers participating in the survey have started farming without participating in the support programmes. Participation rate is even lower (36 %) in the support measures of the farm expansion. The differences across the genders are not significant for both the setting up and expansion measures (Table 3). Therefore, women and men enjoy equal access to the support measures for the young farmers in Lithuania.

The respondents were asked to rate the statements regarding the perceived effects of the direct support payments for the young farmers. The Likert scale is used with 1 indicating disagreement and 5 meaning agreement. Then, we compare the results gender-wise (Table 4). The results are not significantly different at the 10 % level. Therefore, both men and women young farmers attach the same importance to the effects of the direct payments. The lowest p-value (0.13) is observed for investment decision. Indeed, the results show that women young farmers consider the direct payments as a more important factor for investing in agricultural activities (average score is 4.08) if compared to the men young farmers (3.87). Even though this difference is not significant at an acceptable level of significance, the female young farmers seem to be more prone to invest in farming activities if support is allocated. This may indicate a lack of seed capital for the female young farmers in Lithuania.

Besides the perceived effects of the direct payments for the young farmers, the respondents were also asked about the desirable effects of the support payments. The results are presented in Table 5. Again, there are no significance differences between the preferences of men and women young farmers in Lithuania at a 10 % level. However, the share of women farmers willing to expand the livestock production is 6 p.p. less that of the men farmers. The women young farmers are also more prone to switch to alternative to agriculture activities than men farmers do (11 % against 6%). Also, female farmers reported lower interest in the expansion of crop production. All in all, women young farmers seem to be more interested in expanding their activities beyond the traditional agricultural domain if compared to the men farmers.

The respondents were asked if they had used the advisory services. In order to ascertain whether this service has different outreach gender-wise, we investigate the differences in the use of the advisory services. The p-value for the chi-square test is 0.13 indicating that the differences between men and women young farmers are not significant in terms of the use of the advisory services. However, the p-value is close to the limit of 10 % which implies that the difference should still be considered. The results indicate that 75 % men and 67 % women young farmers have used advisory services in Lithuania. The lower rate of the use of the advisory service among the women farmers may be related to their higher education level. However, the advisory services need to be tailored to correspond to the needs of the young women farmers in Lithuania.

The demand for the advisory services corresponds to the preferences of the respondents. Thus, they were asked to identify the key topics which require assistance by the advisory service. The results are provided in Table 6 (only the five most popular choices are provided in the table).

There are no significant differences between men and women farmers. The lowest p-values are observed for the implementation of the environmental requirements (the share of women requiring such service is higher by 5 p.p.) and preparation of the business plan (the share of women requiring such service is lower by 6 p.p.). These results can be related to the higher education attainment level by the women young farmers.

### Table 2
Demographic and farm characteristics across genders.

| Variable                        | Men     | Women  | Total  | Sig. |
|---------------------------------|---------|--------|--------|------|
| Gender                          | 385     | 88     | 473    | -    |
| Residing in rural area          | 81 %    | 19 %   | 100 %  | -    |
| Higher education                | 214     | 67     | 281    | ***  |
| Utilized agricultural area, ha  | 78      | 70     | 76.5   |      |
| Crop                            | 206     | 41     | 247    |      |
| Farming type                    | 54%     | 47 %   | 52 %   |      |
| Mixed                           | 127     | 38     | 165    |      |
|                                    | 33 %    | 43 %   | 35 %   |      |

Note: Gender is compared to the whole sample, whereas the remaining rows are compared to the column totals for Gender; differences are tested by applying chi-square test (or t-test for the utilized agricultural area); *** indicates significance at the level of 1%.

### Table 3
Participation in the support measures for the young farmers across genders.

| Variable                        | Men | Women | Total | Sig. |
|---------------------------------|-----|-------|-------|------|
| Setting up                      | 171 | 35    | 206   |      |
| Expansion                       | 44 %| 40 %  | 44 %  |      |
|                                  | 141 | 30    | 171   |      |
|                                  | 37 %| 34 %  | 36 %  |      |

Note: rows are compared to the column totals for Gender in Table 1; differences are tested by applying chi-square test.

### Table 4
The perceived effects of the direct payments for the young farmers in Lithuania.

| Variable                        | Men    | Women | Total | Sig. |
|---------------------------------|--------|-------|-------|------|
| Income level support            | 4.32   | 4.27  |       |      |
| Finding new markets             | 2.9    | 2.94  |       |      |
| Diversification of farming activities | 3.32  | 3.3   |       |      |
| Decision to continue farming    | 3.8    | 3.84  |       |      |
| Setting up in rural area        | 3.48   | 3.42  |       |      |
| Investing                       | 3.87   | 4.08  |       |      |
| Create new workplaces           | 3.09   | 3.19  |       |      |

Note: five-point Likert scale is applied; t-test is applied for comparison.

### Table 5
The desirable effects of the support payments for the young farmers in Lithuania.

| Variable                        | Men    | Women | Total | Sig. |
|---------------------------------|--------|-------|-------|------|
| Expansion of crop production    | 295    | 63    | 358   |      |
| Expansion of livestock production | 138  | 26    | 164   |      |
| Processing of the production    | 125    | 30    | 155   |      |
| Expansion of activities alternative to agriculture | 24  | 10    | 34    |      |
| Adaptation to the change        | 43     | 9     | 52    |      |
| Adoption of the quality assurance systems | 6  | 4     | 10    |      |

Note: rows are compared to the column totals for Gender in Table 1; differences are tested by applying chi-square test.

### Table 6
The share of respondents demanding certain advisory services.

| Advisory service                      | Total | Men | Women | Sig. |
|---------------------------------------|-------|-----|-------|------|
| Improving production quality          | 0.21  | 0.21| 0.23  |      |
| Implementation of agri-environmental requirements | 0.09 | 0.08| 0.13  |      |
| Preparation of business plan          | 0.29  | 0.30| 0.24  |      |
| Embarking on non-agricultural activities | 0.08 | 0.08| 0.07  |      |
| Improvement of sales                  | 0.08  | 0.08| 0.09  |      |
5. Discussion

The results indicate that young women farmers have higher education compared to men young farmers in Lithuania. Although exploitation of this potential is still limited by the fact that agriculture is seen as men business (Johnson et al., 2016) and agricultural land owners are willing to transfer their possessions to male offspring (Hall et al., 2017). This attitude significantly dampens the possibility of young women entering agricultural business, as other ways of acquiring land in EU Member States are very complicated (Constantin et al., 2017; Bórawski et al., 2019).

Bigger women’s participation in agriculture is welcomed from the point of enhancing agricultural resilience also because they are more prone to mixed types of agriculture and are more willing to change the direction of agricultural activities than needed. This is of utmost importance, as recent crisis showed (economic consequences of COVID-19 pandemic) the lack of flexibility in EU agriculture (Frančić and Kovačiček, 2019), which resulted in the necessity of intensive Government involvement with financial and organizational measures to ensure the economic viability of farmers.

The revealed higher women’s proneness to innovation and interest in expanding activities beyond the traditional agricultural domain, compared to men is of utmost important in ensuring long-term economic sustainability of agricultural sector, as multi-level diversification of products, activities, financial sources of economic actors is essential (Pugh, 2001; Li et al., 2005; Moussa et al., 2018). Higher environmental awareness of women is also considered important, as it not only creates preconditions for more easily adapting climate-smart agriculture techniques (Buyer and Partey, 2019) in Lithuanian agriculture, but also can help mitigate one of the negative consequences of the CAP payments – increasing land degradation (Panagos et al., 2016). These findings at some point contradict Theriault et al. (2017) and support those by Ngigi et al. (2017). Contradictions can be attributed to different socio-economic environments (developed vs developing countries, different possibilities to run a farm) indicating the necessity to adapt the research of such type to local conditions and limiting the extrapolation and generalization of the results.

6. Conclusion

The results indicated that the Lithuanian men and young women farmers significantly differ in terms of education. Specifically, the women young farmers appeared to be better educated than men young farmers. The other characteristics of farms and farmers (size, specialization, place of residence) did not differ significantly across the genders.

The study showed that there is no serious gender gap in Lithuanian agriculture in terms of young farmers. The results showed a higher interest of women towards embarking of non-agricultural activities (6% of men and 11% of women expect this activity to be supported by the direct payments), yet this difference was not statistically significant. The same conclusion can be applied for lower propensity to extend the livestock farming and higher interest in adoption of the quality assurance systems for women young farmers. As regards the effects of the existing direct payments and demand for advisory services, the results were almost identical across the two groups of farmers.

The present study provides a reference point for further research on gender gap in Lithuanian agriculture. Future studies could address not only the young farmers, but also farmers from different age groups. The data on the workload associated with men and women farmers on a farm could also be taken into account as the current study only considered the gender of the farm owners. Finally, the income gap should be considered in the further research besides the perceived effects of the CAP.

CRediT authorship contribution statement

Tomas Balezentis: Conceptualization, Formal analysis, Investigation, Methodology, Software, Writing - original draft. Man-girdas Morkunas: Conceptualization, Formal analysis, Methodology, Writing - original draft. Artiom Volkov: Conceptualization, Formal analysis, Methodology, Writing - original draft. Erika Ribasauskiene: Conceptualization, Formal analysis, Methodology, Writing - original draft. Data curation. Dalia Steimikienė: Formal analysis, Methodology, Writing - review & editing.

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