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Is Fueling the Economy with Too Much Finance Good?

Ahmet USTA[1]

Abstract

This study provides evidence on the nonlinear effects of financial development on economic growth and income inequality in Turkey over the period 2001:Q1 and 2020:Q4. To document how financialization affects economic growth and income inequality, we estimate dynamic OLS (DOLS) and conduct Toda-Yamamoto Granger causality test. We find evidence of a nonlinear relationship on the financial development and economic growth nexus, and financial development and income inequality nexus. In the initial period of financial development, economic growth increases, and income inequality widens, after a certain threshold economic growth decreases and income distribution becomes more equal. We also test causality patterns and find a bilateral causation between financial development and economic growth, and a one-way causality from income inequality to finance.

***Keywords**: Financial development, Economic growth, Income inequality*

***JEL Classification**: C22, E44, O15, O16, O40*

Ekonomiyi Fazla Finansallaştırmak İyi midir?

Özet

Bu çalışma, 2001:Ç1 ve 2020:Ç4 döneminde Türkiye'de finansal gelişmenin ekonomik büyüme ve gelir eşitsizliği üzerindeki doğrusal olmayan etkilerine dair kanıtlar sunmaktadır. Finansallaşmanın ekonomik büyüme ve gelir eşitsizliğini nasıl etkilediğini ortaya koymak için dinamik olağan en küçük kareler yöntemi ve Toda-Yamamoto Granger nedensellik testi kullanılmıştır. Finansal gelişme ve ekonomik kalkınma ilişkisi ile finansal gelişme ve gelir eşitsizliği ilişkisinin doğrusal olmadığına dair kanıtlar ortaya konmuştur. Finansal gelişmenin ilk döneminde, ekonomik büyümenin arttığını ve gelir eşitsizliğinin daha da bozulduğunu, belirli bir eşikten sonra ekonomik büyümenin azaldığını ve gelir dağılımının daha dengeli hale geldiği söylenebilir. Ayrıca nedensellik testi ile finansal gelişme ile ekonomik kalkınma arasında iki yönlü Granger nedensellik söz konusu iken, gelir eşitsizliğinden finansal gelişmeye doğru tek yönlü Granger nedensellik tespit edilmiştir.

***Anahtar Kelimeler**: Finansal gelişme, İktisadi büyüme, Gelir eşitsizliği*

***JEL Sınıflandırması**: C22, E44, O15, O16, O40*

1. Introduction

Analyzing the impact of financialization on economic growth and income inequality has received a significant attention in recent decades. It is well known that the financial development may influence economic growth positively. A healthy financial system can strength the overall economy by facilitating risk sharing and increasing savings, which lead to an efficient allocation of resources

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(Peia and Roszbach, 2015; Nguyen et al., 2019). Thus, financial constraints of agents get relaxed, and their investment opportunities increase. As a result of this process, income distribution across different group of people is affected. So, the degree of financial deepening has direct impact on income inequality, as well.

According to Kuznets (1955), there is an inverted U-shaped (non-linear) relationship between economic growth and income inequality. The development in the economy initially increases income inequality, but after a certain point it decreases the income inequality. Greenwood and Jovanovic (1990) suggested that financial development may have impact on the idea behind the Kuznets curve hypothesis. Their results highlight the link between financial development, economic growth, and income inequality. Therefore, understanding the role of financial development on growth and income distribution in an economy is important.

There is a large body of empirical literature that presents evidence on the impact of financial development on the economic growth and income inequality. The finance-growth nexus and the finance-inequality nexus have been studied extensively[2]. In general, the studies in the finance-growth nexus are classified into two groups. First, empirical works document linear effect of financial development on growth. Second, empirical studies present non-linear impact of financialization on economic growth (Soedarmono et al., 2017). The literature on the nexus between finance and inequality can be classified into three groups. First, inequality-widening hypothesis suggests that the finance increases inequality. Second, inequality-narrowing hypothesis implies that the well-functioning of the financial markets reduces income inequality. Third, inverted U-shaped Kuznets curve hypothesis showing a non-linear relation between financial development and income distribution (Chiu and Lee, 2019).

Based on the above hypotheses, this study investigates the association between the financial development, economic growth, and distribution of income in Turkey. On the contrary to the recent literature that highly concentrated on a group of economies with different characteristics, we believe that a single country analysis is helpful to provide country specific policy suggestions. Motivated by the relevant literature, we pose the following questions: 1) In what extent the financial development affects the economic growth and income inequality? 2) What are causal relationships among these concepts, if any? To answer these questions, we study the dynamic OLS to obtain long-run relationships and causality between financial development, growth, and income inequality.

Our estimation results from time series analysis suggest that there is a non-linear relationship between financial development and economic growth and, income inequality. First, in the early stage of financialization we observe the economic growth improves, but it worsens beyond a threshold level of financial development. Second, estimation results suggest an inverted U-shaped relationship between financial deepening and income inequality. We confirm the Kuznets curve

[2] Section 2 provides an overview of previous research on this topic.

hypothesis since the income inequality widens in the early stage of financialization and narrows after a certain level of financial development. Third, we find a bilateral and significant causality between the financial development and economic growth. However, we observe a significant causality running from income inequality to financial deepening.

The organization of the rest of this study is as follows. Section 2 reviews the concept of financialization and relevant literature. Section 3 presents data and empirical methodology used in this paper. Section 4 presents the empirical evidence. Section 5 concludes the paper.

2. An Overview of the Concept of Financialization and Literature

2.1. Financialization and Some Stylized Facts in Turkey

Although the definition of financialization is still yet unclear and undeveloped, it is an important concept that should be considered especially after the global financial crisis (GFC) in 2008. The roots of the concept of the financialization lie in the alteration of behavioral patterns of agents in the capitalist economies (Lapavitsas, 2013:794). The systematic and behavioral changes manifest itself in the non-financial corporations, financial intermediaries, i.e., banks, and households. Non-financial corporations have become less reliant on banks and sought their own financing, banks have expanded their services along with the technological development and provided a variety of services with fees and commissions, and finally households have taken place in the financial system as an investor and borrower (Lapavitsas, 2011). All three elements have become more financialized.

Financialization in Turkey has been assessed mainly through consumer credits and developments in housing market (Karaçimen, 2014; Erol, 2019; Yeşilbağ, 2020). Karaçimen (2014) followed a political economy framework and offered an extensive summary of transformations within the scope of financialization to explain the drivers of increasing consumer debt in Turkey. Several dimensions including developments in banking sector, labor market, and welfare policies were analyzed to explain increasing demand for consumer credit in Turkey. The author highlighted the impact of the deep integration of Turkish economy into global economy mainly through capital flows, which could affect banking sector activities via different channels. She argued that the dependence of Turkish corporations on domestic banks has decreased because they are able to borrow from abroad. Thus, to make profits, the lending activities of banks have shifted to households. Due to high rates of unemployment, wage stagnation and insecure job opportunities, the households have leaned on the consumer credits even for daily consumption. Booms in the construction industry has accompanied with a steep rise in the debt burden of non-financial corporations, i.e., construction and real-estate companies. Together with the residential mortgages provided to households, construction industry has become financialized (Erol, 2019).

According to TurkStat, the GINI coefficient as a measure of income inequality was estimated at 0.395 in 2019, while it was at around 0.402 in 2010. In Turkey, the mean household income has increased gradually in the last decade. Regarding the

types of income, the total share of wage and salaries decreased by 1.8 % and reduced to 46.7% in 2019 compared to 2018. In the Turkish economy, the mean annual income has increased at most in the construction sector by 18.9% in 2019.

Banks for International Settlement (BIS) reports the total credit to private non-financial sector, including non-financial corporations, households and non-profit institutions provide services to households. In the third quarter of 2019 and 2020, the amount of total credit in Turkey was around 3,3 and 4,5 trillion of TL, respectively. In the same quarters, the share of the total credit in GDP in 2019 and 2020 was around 80% and 94.7%, respectively.

2.2. Literature Review

This research is related to two strands of the relevant literature. First, it can be classified under the group of empirical research on the financialization and economic growth. Second, it is related to the studies, which investigate the impact of financialization on income inequality.

Hassan et al. (2011) documented the relationship between financial development and economic growth for low- and middle-income countries over 1980 and 2007 by estimating a panel regression and variance decomposition. They used various measures including ratio of domestic credits, money supply, domestic savings, trade, and government expenditures to GDP for financial development. They found that the relation between financial development and economic growth is positive in developing countries. They also found that gross domestic savings has a positive relation with output growth.

Law and Singh (2014) provided evidence on impact of finance on economic growth by using 87 developed and developing countries for the period 1980 and 2010. They estimated dynamic panel threshold regression with three banking sector related measures of financial development including private sector credit, liquid liabilities, and domestic credit (% of GDP). Economic growth is proxied by the real GDP per capita. Findings indicated that the financial development has adverse impact on growth beyond a threshold level, which suggest that the financial development has an inverted U-shaped effect on growth.

Arcand et al. (2015) examined the role of financial depth on economic growth, where the former was quantified by credit to the private sector provided by the deposit banks and other financial institutions and the latter was proxied by annual growth rate of GDP per capita. As an additional set of regressors, they used human capital, trade openness, inflation, and government expenditures (% of GDP) over the period between 1960 and 2010. Their estimation results suggested that the financial depth has a positive correlation with economic growth in countries with small and intermediate financial sector. However, the positive correlation becomes negative after a threshold level, which means that too much finance may lead to negative growth.

Peia and Roszbach (2015) investigated the relationship between financial and economic development empirically by conducting cointegration and causality

analyses for 22 advanced economies over the period between 1973 and 2011. They employed real GDP proxy for the economic development. They identified financial development based on stock market and banking sector, where the former proxied by stock market capitalization as a share of nominal GDP and the latter one proxied by the domestic bank credit to private sector as a share of nominal GDP. They find that the causality running from stock market development to economic development, while there is a reverse causality between the banking sector development and economic development.

Park and Shin (2017) empirically analyzed the relationship between financial development and income inequality in a sample of 162 countries over the period between 1960 and 2011. They employed three different measures for financial development including liquid liabilities (% of GDP), private credit by deposit banks (% of GDP), and stock market capitalization (% of GDP). They used GINI coefficient and the share of national income earned by the richest 1% to measure income inequality. They found a non-linear relationship between financial development and income inequality through panel estimation. Their findings suggested that the financial development influence income inequality with a threshold effect. Up to a threshold point, financial development reduces income inequality. However, beyond the threshold level the financialization increases inequality.

Chiu and Lee (2019) tested whether country risks have impact on financial development and income inequality nexus with a panel data of 59 countries over the period 1985-2015. They estimated panel smooth transition regression model, in which financial development was measured by banking sector development (domestic credit to private sector, % of GDP) and stock market capitalization (% of GDP), and income inequality was measured by GINI coefficients. For the country risks, they used political, financial, and economic risk ratings. Their findings suggest that the impacts of country risks on financial development and income inequality nexus differ with respect to the type of risk.

Cuesta-Gonzalez et al. (2020) analyzed the relationship between financialization and growth with a special attention on income inequality by considering a panel of nine OECD countries between 2000 and 2015. They used net GINI coefficient as the dependent variables and two proxies for financial depth, namely, credit provided to the private sector (% of GDP) and stock market capitalization (% of GDP). They also considered several components including institutional, behavioral, and environmental while analyzing the financialization and income inequality nexus. Main result of the research confirmed that credit expansion led to over indebtedness and asset price appreciation. Moreover, too much finance could result in wealth disparities.

On the ground of above discussion and literature, we test the following hypotheses in this paper:

Hypothesis 1: Financialization has impact on economic growth and income inequality.

If the Hypothesis 1 holds, we expect to have either a linear or non-linear relation on the nexus between finance and economic growth, and finance and income inequality.

Hypothesis 2: There are significant causalities among financial development, growth, and income distribution.

If the Hypothesis 2 holds, we expect that the financialization is useful in forecasting economic growth or income inequality, or vice versa.

3. Data and Econometric Methodology

3.1. Data, Variables, and Sample

In this paper, we use quarterly data over the period between 2001:Q1 and 2020:Q3. This period is important since the economic policies undertaken in post-2001 have led credit debt to increase (Karaçimen, 2014; Erol, 2019). Therefore, observations during this period would let us to investigate the clear impact of financialization on economic growth and income inequality.

The data selection of this paper is consistent with the previous literature. We use logarithm of real GDP (GDP) as a proxy for economic growth in line with Peia and Roszbach (2015). We follow Nguyen et al. (2019) and Chiu and Lee (2019) to measure income inequality. To do so, we utilize GINI coefficient, which takes any value between 0 and 1. The coefficient indicates an increasing income inequality if it approaches to 1. To measure financial development quantitatively, we use credit to private non-financial sector form deposit banks and other financial institutions as a share of nominal GDP (Arcand et al., 2015). Beck and Levine (2004) considered credit provided by deposit banks only. However, since the economic and financial integration of countries have started to increase in the beginning of 2000s, credit expansion should not have been attributed to domestic banks only. Therefore, it would be more appropriate to use total credit to private non-financial sector provided by the deposit banks and other financial institutions (FIN). Higher value of financial development indicates a higher dependence on the credit provided by corporations serve as financial intermediaries. As suggested by the recent literature, governments have used fiscal policies including progressive taxes, public transfers, and public spending on education to reduce inequality (Park and Shin, 2017). Therefore, we use general government final consumption expenditures as share of nominal GDP (GOV) to measure the impact of fiscal policies as in Hassan et al. (2011) and Nguyen et al. (2019). Finally, we use change in the consumer price index to control distortions in the prices (INF).

3.2. Empirical Methodology

This section presents the methodology that is used in this paper. To investigate the impact of financialization on economic growth and income inequality, the empirical literature follows several techniques including time series and panel data analyses. In both approaches, cointegration and causality tests have been extensively used. This paper uses time series analysis.

As a first step in the time series analysis, before moving to test for the long run relationship and causality analysis, it is important to conduct unit root tests. For this reason, we conduct widely accepted unit root tests including the Augmented Dickey Fuller (ADF) (1979) and Phillips-Perron (PP) (1988). Both tests have the null hypothesis of a unit root in time series. Depending on the order of integration we move on appropriate methodology. If the time series of a variable is not stationary at level, we perform same tests with first differenced form.

Dynamic ordinary least squares (DOLS) approach is used to obtain long-run coefficients. Saikkonen (1991) and, Stock and Watson (1993) obtain asymptotically efficient and unbiased estimates via DOLS with a time domain correction. The advantages of this model are as follows. First, the DOLS deals with the potential endogeneity and serial correlation of independent variables into account by including lead and lag differences of independent variables. Second, the DOLS is applicable irrespective of order of integrations of variables in small samples. Therefore, we estimate DOLS models to obtain long-run coefficients. The DOLS model we estimate in this paper is shown as follows:

$$Y_t = c_0 + \sum_{r=-k}^{r=k} \alpha_i \Delta X_{t+r} + L_i + \varepsilon_t \qquad (1)$$

where i is the number of independent variables. α_i is the coefficients of lead and lag differences of independent variables, ΔX. The number of leads and lags are shown by k, which is determined by minimizing information criterion. The long-run coefficients are represented by L_i.

We follow Toda and Yamamoto (1995) (T-Y approach) to test Granger causality. By definition, Y is said to Granger-cause X if current or lagged values of Y contritubes to a better prediction of future values of X when compared to X alone. T-Y procedure is applicable regardless of cointegration process of the series. The algorithm of T-Y consists of four steps. First, we find maximum order of integration in the variables, d_{max}. Second, we determine the optimal lag length, k, of the variables in the VAR model depending on the information criterion. Third, we estimate VAR model in levels with a lag of $(k + d_{max})$. In the fourth and the final step, we use Wald test to test the null hypothesis of no Granger causality between variables. The Wald test statistics follows an asymptotically chi-square distribution with k degrees of freedom. To investigate causality between variables, we estimate following general form of VAR model:

$$Y_t = c_0 + \sum_{i=1}^{k} \alpha_{1i} Y_{t-i} + \sum_{j=k+1}^{d_{max}} \eta_{1j} Y_{t-j} + \sum_{i=1}^{k} \omega_{1i} X_{t-i} + \sum_{j=k+1}^{d_{max}} z_{1j} X_{t-j} + u_{1t} \qquad (2)$$

$$X_t = c_1 + \sum_{i=1}^{k} \alpha_{2i} Y_{t-i} + \sum_{j=k+1}^{d_{max}} \eta_{2j} Y_{t-j} + \sum_{i=1}^{k} \omega_{2i} X_{t-i} + \sum_{j=k+1}^{d_{max}} z_{2j} X_{t-j} + u_{2t} \qquad (3)$$

The null hypothesis of no Granger causality in Equation 2 is $H_0: \omega_{1i} = 0$. A rejection of the null hypothesis implies Granger causality between X and Y. Put differently, in Equation 2 (3), $\forall_i$, Granger causality between X and Y is observed if $\omega_{1i}(\alpha_{2i}) \neq 0$.

4. Results

Given the specification explained above, this section presents the results. Before proceeding to estimation results and causality analysis, we examine the stationarity of the variables. The null hypothesis of both ADF and PP tests assumes the unit root. Table 1 displays the results of unit root tests. Schwarz information criterion is used for the optimal lag. As suggested by the p-values in Table 1, the first difference of GDP and FIN are stationary. However, we have inconclusive result about the order of integration of GINI and GOV. INF is level stationary.

Table 1. Unit Root Test Results

	ADF		PP		
Variable	Level	First difference	Level	First difference	Order of Integration
GDP	0.971	0.005	0.558	0.000	I (1)
GINI	0.002	0.037	0.061	0.035	Uncertainty
FIN	0.984	0.000	0.981	0.000	I (1)
GOV	0.534	0.000	0.000	0.000	Uncertainty
INF	0.000	0.000	0.000	0.000	I (0)

To investigate long run relationships between financial development, economic growth, and income inequality we estimate DOLS. Thank to modeling advantages of DOLS we can achieve long-run coefficients. First, we estimate DOLS models with two specifications for each of the dependent variables, i.e., GDP, and GINI. In the first specification, the regressors are FIN and FIN^2. The reason why we incorporate the squared term of financial development is to investigate whether there is a non-linear effect of financialization on economic growth and income inequality. In the second specification, we consider the impact of fiscal policies and inflation on the growth and income distribution.

The estimation results are in Table 2. In the model where the dependent variable is GDP, the coefficients of the FIN and FIN^2 are statistically significant, while the sign of the former is positive, and the latter is negative in the first specification. This result suggests a non-linear relation between financial development and economic growth. The financialization initially affects economy positively. However, after a certain point the relationship becomes negative. Our finding fits into the literature with the findings of Soedarmono et al. (2017) and Nguyen et al. (2019), who observed nonlinearity in the finance-growth nexus. In the second specification, the impact of fiscal policies measured by the GOV on the GDP is negative. However, the effect is statistically insignificant. The coefficient of INF is negative and statistically significant, which implies that the high inflation is harmful for the economic growth. Model 2 in Table 2 considers GINI as the dependent variable. The estimation results in the first specification suggests a non-linear relation between financial development and income inequality, which follows an inverted U-shaped Kuznets curve hypothesis. These results are consistent with the findings Chiu and Lee (2019) and Nguyen et al. (2019). During the initial phase of

the financialization, rich people could benefit more than the poor people. As the financial development strengths, the poor people can also get access to financial market and have a chance to increase their investments. Thus, income inequality narrows. In the second specification of the Model 2, we observe that the coefficient of the GOV is negative and statistically significant. This result highlights the income inequality narrowing role of fiscal expenditures as suggested by Piketty et al. (2014), who found that the fiscal policies may reduce the income inequality. The coefficient of the INF shows that high inflation widens income inequality. The economic intuition behind this result should be high inflation has negative and pronounced effect on poor people.

Table 2. DOLS Estimation Results

	Model 1: GDP		Model 2: GINI	
Regressor	1	2	1	2
FIN	4.51*** (0.86) [5.23]		0.14** (0.04) [3.21]	
FIN^2	-4.67*** (0.8) [-5.9]		-0.15*** (0.04) [-4.00]	
GOV		-3.49 (5.3) [-0.65]		-2.6** (1.07) [-2.47]
INF		-10.74** (5.02) [-2.13]		4.62** (1.21) [3.8]
C	16.8 (0.2) [84.7]	18.35 (0.73) [24.93]	0.38 (0.02) [18.31]	0.68 (0.13) [5.00]
Adj. R^2	0.7	0.22	0.93	0.81

Standard errors are in parentheses. t-Statistics are in square brackets. *, **, and *** indicate 10%, 5%, and 1% significance levels, respectively.

We estimate VAR models to investigate test the Granger causalities between variables. Schwarz information criterion is used for lag selection. According to the Table 1, the maximum order of integration is one. Due to methodological advantage of T-Y procedure, we are not concerned with whether there exists a cointegration between variables or not. Table 3 reports the results. The first two rows show test results for FIN and GDP. Our test results indicate a two-way causation between GDP and FIN, which is consistent with the findings of Hassan et al. (2011) and Demetriades and Hussein (1996). The interpretation of this result would be the growth performance of Turkey leads to an increasing demand for financial services. Moreover, the result suggests that the Turkish economy has experienced a finance-led growth. Last two rows present the causality results between FIN and GINI. We find that the causality runs from income inequality to financial development. This result supports the findings of Park and Shin (2017). Depending on whether income

inequality narrows or widens, people can benefit from financial services. Rich people can get higher returns from financial market as the income inequality widens or poor people can earn and save more as the inequality narrows.

Table 3. Toda-Yamamoto Granger Causality Test Results

Null hypothesis H_0	Wald chi-square Statistic	Prob.	Reject H_0
FIN does not Granger cause GDP	9.6	0.08	Y
GDP does not Granger cause FIN	21.15	0.00	Y
FIN does not Granger cause GINI	14.96	0.18	N
GINI does not Granger cause FIN	28.9	0.00	Y

5. Conclusion

There is a growing importance of financialization in the past decades. Understanding the effects of the financialization on economic growth and income inequality is important. In this study, we examined DOLS and Granger causality tests to report the direction and relationships between financial development, economic growth, and income distribution in Turkey with a quarterly data over the period between 2001:Q1 and 2020:Q4.

In agreement with the recent literature, our findings suggest that developments in financial system initially increases economic growth and leads rich people to increase their earnings more. However, after a certain point financial development is negatively related to economic growth and narrows income inequality. Overall examination of our findings presents an inverted U-shaped curve between financial development and economic growth, and income inequality. We also found that the fiscal policies may lead to a narrow the income disparities among rich and poor people. Our results also confirm that the high inflation has negative impact on economic growth and income dispersion. We observed a bilateral causality between financial development and economic growth, and unidirectional causality from income inequality to financialization.

Undoubtedly, the financial development has an important impact on economic growth and income inequality in the economy. Therefore, policy makers should undertake appropriate reforms and actions to ensure sustainable growth and fair redistribution of national income. The financial system should be regulated in a way that allocation of services should be efficient. Regulatory reforms should be conducted to support financial system in response to destabilizing shocks. There should be an efficient credit allocation to achieve sustainable growth in the economy. Particularly, the primary target should be small and medium firms. Fiscal

policies should be expanded to address the income inequality. The priority of policies in the agenda should address those at the bottom of the income distribution.

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Appendix

Table A.1 Construction of Variables with Their Definitions and Sources

Variable	Construction	Definition	Source
GDP	Logarithm of real GDP	Economic Growth	OECD
GINI*	Level of GINI Coefficient	Income Inequality	TurkStat
FIN	Ratio of credit to private nonfinancial sector from deposit banks and other financial institutions to nominal GDP	Financial Development	BIS
GOV	Ratio of general government final consumption expenditure to nominal GDP	Government Expenditures	OECD
INF	Change in CPI	Inflation	IMF IFS

* Since GINI data not available in quarterly, we used interpolation method to convert annual GINI data into quarterly frequency.

Table A.2 Descriptive Statistics

Variable	Mean	Median	Std. Dev.	Max	Min
GDP	17.52	17.6	0.31	18.03	16.59
GINI	0.4	0.4	0.01	0.46	0.37
FIN	0.54	0.56	0.23	0.94	0.19
GOV	0.13	0.13	0.01	0.17	0.1
INF	0.03	0.02	0.03	0.20	0.0

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The Impact of Human Capital and Defense Expenditures on Economic Growth: Panel Analysis for Selected SSA Countries

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Abstract

The purpose of this study is to investigate the existence of heterogeneity in the effect of human capital and defense expenditures on the economic growth of sub-Saharan African countries based on evidence from eight of these countries for the period 2014-2017. The panel fixed effect and the Least Square Dummy Variable (LSDV) version of the fixed effect models are employed. The findings reveal that, while education and defense expenditures have positive and statistically significant impact on the economic growth of the various countries, the effect of health expenditure on economic growth is positive and insignificant. Further, some significant level of heterogeneity is found in the manner human capital and defense expenditures impact economic growth in the various countries, and this is attributed to varying weights the different countries place on the need for their human capital development. Appropriate policy recommendations are made based on these findings.

***Keywords**: Human capital expenditure, Economic Growth, Panel analysis, Sub-Saharan African countries*

***JEL Classification**: E24, F43, C33*

Beşeri Sermaye ve Savunma Harcamalarının Ekonomik Büyüme Üzerindeki Etkisi: Seçilmiş SSA Ülkeleri için Panel Analizi

Özet

Bu çalışmanın amacı, beşeri sermaye ve savunma harcamalarının Sahraaltı Afrika ülkelerinin ekonomik büyümesi üzerindeki etkisindeki heterojenliği, 2014-2017 dönemi için bu ülkelerden sekizinin kanıtlarına dayanarak araştırmaktır. Çalışmada panel sabit etkiler ve En Küçük Kareler Kukla Değişkenli (LSDV) versiyonu olan sabit etkiler kullanılmıştır. Bulgular, eğitim ve savunma harcamalarının çeşitli ülkelerin ekonomik büyümesi üzerinde pozitif ve istatistiksel olarak anlamlı bir etkiye sahip olduğunu, fakat sağlık harcamalarının ekonomik büyüme üzerindeki etkisinin ise istatistiksel olarak anlamsız olduğunu göstermektedir. Buna ek olarak, beşeri sermaye ve savunma harcamalarının çeşitli ülkelerdeki ekonomik büyümeyi nasıl etkilediği konusunda önemli bir heterojenlik olduğu ve bunun farklı ülkelerin beşeri sermayeyi geliştirme ihtiyacına farklı ağırlıklar koymalarından kaynaklandığı düşünülmektedir. Çalışmada bu bulgulara dayanarak uygun politika önerileri yapılmıştır.

***Anahtar Kelimeler**: Beşeri sermaye harcamaları, Ekonomik büyüme, Panel analiz, Sahraltı Afrika ülkeleri*

***JEL Sınıflandırması**: E24, F43, C33*

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1. Introduction

The importance of human capital development for the growth of world economies cannot be over emphasized as human capital constitutes an integral part of every economy. So important is human capital for development that its elements occupy important positions in the Sustainable Development Goals (SDGs) of the United Nations and the Bretton Wood institutions. Indeed, the World Bank and the International Monetary Fund (IMF) have continuously drummed home the need for member countries most especially those in Sub-Saharan Africa to pay close attention to their human capital development in order to achieve a prosperous future (Karambakuwa et al., 2020).

Even at the times when these Bretton wood institutions are on the neck of Sub-Saharan African countries to maintain fiscal discipline in every respect, dispensation is usually given in the area of human capital development. Few examples abound in this regard. For instance, in 2015, When Ghana lost policy credibility and had to approach the IMF to restore the same, the IMF inter alia persuaded the Ghanaian government to maintain fiscal discipline in every regard save in the area of human capital development (education and health). Also, with the advent of the recent global health crises (COVID-19) a number of African countries including Ghana, Kenya, South Africa, among others approached the IMF for Rapid Credit Facility (RCF) to help manage the consequences of the fallout from the pandemic (IMF, 2019). Under this program, the condition precedent for the acquisition of the funds was for the African countries to commit to using these funds strictly for improving their health systems which is considered an important component of human capital.

What is obvious from the above discussions is that human capital expenditure forms a substantial component of the budget of African countries and according to Gandhi (2020)African governments spend in excess of 5% of their GDP on education alone which is the highest proportion of any region's GDP spent on a single component of human capital globally. Indeed, this high expenditure on education makes African countries meet the financing targets on education set by the United Nations (UN). Similarly, the expenditures on health have been on the rise for most African countries, the average growth rate of health expenditure over the past two decades is 6.7% for West Africa and 4.5% for Southern Africa (Micah et al., 2019).

Closely related to human capital in importance is the issue of security because peace and security are essential for the socio-economic development of economies. They are also essential for the attainment of fundamental human rights in society. Peace and security place 16th among the 17 sustainable goals of the United Nations which is indicative of the critical role security can play towards the achievement of sustainable society for all.

Against this backdrop, countries especially those with poor security potentials have been making frantic efforts to strengthen their security systems. The need to strengthen security systems is even reinvigorated by the widespread terrorist tendencies across the globe. The African continent is not safe from the dangers of

these insurgent groups and the situation in many African countries such as Nigeria, Chad, Somalia among others readily come to mind when the security of Africa is being discussed.

Mostly when these critical issues that have growth potential are being discussed in the African context, there exist the tendency to lump up the efforts of these countries in the way they pay attention to these issues. So, for instance, there is no difference between South Africa, Kenya and Ghana etc. in the way the governments of these countries place importance on health, education and security in terms of expenditure and how that eventually contributes to driving the growth of these countries. However, this study argues that to the extent that countries in the Sub-Saharan region face different economic circumstances and are at different levels in their development endeavors, there is bound to be heterogeneity in the way human capital and defense expenditures contribute to the growth of these countries.

It is important to note that very little attention has been paid to this subject matter in the SSA region with the only known studies being that of Karambakuwa et al. (2020) and Hakeem (2010). However, none of these studies analyzed the combined effects of both human capital and defense expenditures on economic growth. Further, the findings from these studies are not reinforcing. The current study argues that the governments of SSA countries are becoming increasingly concerned about security and therefore committing significant amount of resources to maintaining security just like education and healthcare. Therefore, the current study seeks to fill the gaps of the previous studies in this regard.

Against this background, the purpose of this paper is to answer the question: Is there any difference in contribution to growth among the countries made by human capital? This study is unique for adding to existing literature an up-to-date information on the nexus between growth and human capital development, for various countries at different stages of development in three different regions of Sub-Sahara Africa viz; East, West and South, thus providing a wider coverage. The rest of the paper is organized as follows: The second section is the literature review where associated theoretical and empirical review is analyzed. The third section presents the methods and sources of data while the estimation strategies are presented in the fourth section. The fifth section presents the conclusions and policy directions.

2. Literature Review

This section presents the theoretical foundations of this study and the empirical works done in the past in the realm of the nexus between governments' human capital (education and health) expenditure as well as defense expenditure and economic growth. In particular, the empirical review covers the research done on this subject matter in the context of Africa.

2.1.Theoretical Review

For many years, the study of the nature of the relationship between government expenditure and the impact it has on the growth rate of the economy has been

addressed by many economists. Various theories and laws have since been proposed to help in this explanation. Whereas the theories have been tested and found to be valid for some economies, for other economies, they are invalid or inconclusive.

Wagner's Law which posits that an increase in national income leads to an increase in public expenditure. Public expenditure in this case refers to expenditure on security and welfare activities. This implies the existence of a one-way causal relationship from national income to government expenditure. Public expenditure for emerging economies is not only endogenous but is also seen to be growing proportionately to the growth in income Wagner's law, however, has been criticized for failing to consider the unforeseen economic events like wars and pandemics which could lead to an abnormal level of public expenditure. It is also criticized on grounds that it overlooked the nature of relationships in the short-term. Although this law was born out of a study Wagner conducted for Germany, it has since been extended to other economies for instance Mustapha (2020)concluded that in SSA countries, increase in income led to an increase in productive public expenditure. Gatsi et al. (2019) and Kesavarajah (2012) on the other hand found no evidence of Wagner's Law for Ghana and Sri Lanka.

The interventionist theory of John Maynard Keynes (1936) in his book 'The General Theory of Employment, Interest and Money' where he advocated for government expenditure as a way out of economic recessions. According to Keynes, the multiplier effect of such expenditure is huge and could help revamp the economy in the event of recession. Explaining the multiplier effect, he contends that an increase in the public expenditure would contribute to income earnings by various workers who in turn will spend the income earned on goods and services, this process continues and creates a ripple effect thereby causing a multiple fold expansion in the economy. The main critics of this school of thought argue that it could render an economy debt saddled. It is also argued that it is not possible to point out the exact amount of government expenditure that would lead to growth and thus could be inflationary in the long run (Botha, 1963).

The Peacock-Wiseman Hypothesis focuses on the pattern of public expenditure growth. It states that expenditure grows irregularly and there are three possible causes for this;

First is the displacement effects which are unanticipated economic events like depression and war that have the potential to increase government expenditure which can be financed through various ways including higher taxes and debts.

Second, Inspection effects which occur when the tax levels are increased in a bid to raise more income in response to mechanisms of unforeseen events, such expenditures do not usually decline even after the unforeseen events have passed. The government only tends to expand its operations with the new tax base and as a result growth occurs.

Finally, concentration effects occur when physical and financial resources owned by the government are not equally distributed and they tend to be more concentrated

at the central government rather than at the local government. The expenditure by the central government is therefore observed to be contributing more to growth.

Some writers like Dada, Adesina and State (2013) tested the applicability of Peacock-Wiseman's hypothesis in Nigeria and found that it is valid. The critics of this hypothesis argue that during pandemics and economic recessions, it is harder for governments to resort to higher taxation as a means of obtaining more income and may resort to obtaining debts.

2.1.Empirical Review

Several empirical works abound as far as human capital development and economic growth nexus is concerned. For instance Karambakuwa et al. (2020) and Hakeem (2010) conducted a study on human capital and economic growth nexus in Sub Saharan African countries. Whereas the latter finds human capital to be important for growth, the former fails to establish a significant impact of human capital on growth for SSA. Bethencourt and Fernando (2020) however, finds that the impact of human capital on growth is different across various countries and is highly dependent on the institutional structures present in a country.

A current move by many of the countries is to make their military stronger through improved technology. A few studies that have been conducted to ascertain the impact of this move on growth include Phiri (2019) and Sirag et al. (2016) who analyze the effects of military and public expenditures on the economic growth of South Africa and 97 countries respectively. Both studies reveal the existence of a nonlinear effect of military and public expenditures on growth. However, whereas Phiri (2019) conducted a time series analysis on South Africa, that of Sirag et al. (2016) was a panel study involving 97 countries. Polat (2020) on the other hand, conducted a panel study for 15 developing and developed countries and finds a positive relationship between military expenditure and economic growth. Gokmenoglu et al. (2015) also establishes a long run relationship exists between economic growth and military expenditure in Turkey albeit the direction of relationship is unclear.

To investigate the relationship between government educational expenditure and economic growth, Mallick et al. (2016) and Gemmell et al. (2016) conducted studies for Asian and OECD countries respectively. They both find a positive impact of educational expenditure on economic growth. A similar result is arrived at by Ali et al. (2012) and Bakan and Gökmen (2015) for Pakistan and Turkey respectively. These studies stress on the importance of education in improving quality of life through the impart of new skills needed for growth. Owings et al. (2019) however, states that although education has a positive impact on growth in the long run, there is the need for improvement on teacher quality and equitable access to education in Turkey.

Basuki et al. (2019) and Mose et al. (2014) investigate the impact of government expenditure on economic growth for Indonesia and East Africa respectively. Basuki et al. (2019) finds no sufficient evidence to support the relationship between government expenditure and growth. On the other hand, Mose et al. (2014)

establishes that while investment expenditure positively impacts growth, consumption expenditure negatively impacts growth.

Dincer and Yüksel (2019) and Bedir (2016) analyzed the presence of a causal relationship between health expenditure and economic growth. The former study uses data for developed countries while the latter uses data for developing countries. Dincer and Yüksel (2019) fails to establish the existence of causal relationships between the health expenditure and economic growth in E7 countries. Bedir (2016) finds causal relationships in some countries and for other countries, no causal relationships was found.

Table 1 presents a summary of the empirical reviews on the subject matter.

Table 1: Summary of Empirical Reviews

Country	Author(s)	Period	Methodology	Findings
SSA	Karambakuwa et al. (2020)	1980-2016	Panel approach	Human capital does not have a significant impact on growth
SSA	Hakeem (2010)	1970-2000	MLE, Fixed effect	Human capital and physical capital are important for growth
South Africa	Phiri (2019)	1988-2014	Logistic Smooth transition model	A U-shaped relationship between military expenditure and growth
Asian countries	Mallick et al. (2016)	1973-2012	FMOLS	Education expenditure has a positive impact on growth
Provinces in Indonesia	Basuki et al. (2019)	2010-2015	Panel regression.	No relationship between government expenditure and growth
E7 countries	Dincer and Yüksel (2019)	1996-2016	Pedroni cointegration, Dumitrescu Hurlin causality	A long run relationship exists. No causality relationship
Turkey	Gokmenoglu et al. (2015)	1988-2013	Johansen cointegration and Granger causality	A long run relationship between military spending and growth. Unidirectional causal relationship from growth to military spending.

Country	Author(s)	Period	Methodology	Findings
Countries in Europe and Asia	Bedir (2016)	1995-2013	Granger causality	The relationship is different across countries
OECD	Gemmell et al. (2016)	1970-2007	ARDL	Expenditure on education and infrastructure have a positive impact on growth
97 countries	Sirag et al. (2016)	1981-2010	Dynamic panel threshold technique	Public expenditure has a nonlinear effect on growth.
East Africa	Mose et al. (2014)	1980-2010	Balanced Panel fixed effect model.	Investment expenditure positively impacts growth, consumption expenditure negatively impacts growth
Pakistan	Ali et al. (2012)	1972-2011	OLS	Investment in education, health and physical capital have a positive impact on growth in Pakistan.
Turkey	Bakan and Gökmen (2015)	1970-2013	OLS	Education has a positive and long run relationship with growth.
Turkey	Owings et al. (2019)	Literature review	Literature review	Education is an important factor for development and so teacher quality should be improved in Turkey
15 countries	Polat (2020)	1992-2017	Panel cointegration and PDOLS	A positive relationship is found to exist between military expenditure and economic growth. A one-way causal relationship from national income to defense expenditure exists in the long run.

Country	Author(s)	Period	Methodology	Findings
38 Developing and 51 developed countries	Bethencourt and Fernando (2020)	Data for 2009	OLS	Human capital and economic growth relationship is different across countries mainly because of differences in institutions.

Source: Authors' construct.

3. Methods and Sources of Data

The study employs panel data from 2004-2017 for eight Sub-Sahara African countries viz; Ghana, Senegal, Ivory coast, South Africa, Uganda, Tanzania, Rwanda, and Kenya selected based on the availability of data for the period under consideration. Data on growth, health, education and defense for all countries was obtained from World Development Indicators and knoema sites. To capture the heterogeneous effect of expenditures on education, defense and health on growth of the various countries, seven dummies were introduced each taking a value 1 for the presence of heterogeneity and 0 for absence of heterogeneity.

4. Estimation Strategy

To analyze how the growth rate of the various countries is influenced by their respective expenditures in health, education and defense, the panel estimation method was adapted. The restrictive form of the fixed-effects panel proposed by Giesselman and Catran (2018) employed for this purpose is as follows:

$$Y_{it} = \alpha_i + X_{it}'\beta + \varepsilon_{it} \quad (1)$$

Where β is a vector of panel parameters and X_{it} being a vector of panel independent variables with ε_{it} being the idiosyncratic error term. In this model, each individual has a separate intercept term but with the same slope parameter.

The individual heterogeneity in intercept terms of the cross-sectional units can be estimated from the restrictive panel model in (1) as follows;

$$\hat{\alpha}_i = \underline{y_i} - \underline{x_i}'\hat{\beta} \qquad \text{Since Cov } (\alpha_i, x_i) \neq 0 \quad (2)$$

From equation (2), the individual heterogeneity can therefore be seen as the residual variation in the regressand that is unaccounted for by the regressor variables.

The operational form of the restrictive fixed effect panel model specified in (1) is given below:

$$(GDP_{it} - \underline{GDP_i}) = \beta_1(Eexp_{it} - \underline{Eexp_i}) + \beta_2(Hexp_{it} - \underline{Hexp_i}) + \beta_3(Dexp_{it} - \underline{Dexp_i}) + (\mu_{it} - \underline{\mu_i}) \quad (3)$$

Where each variable in equation (3) is the difference between each panel variable and its time average. The time average for each variable is constructed as per the following formula;

$\underline{Z_i} = \frac{1}{T}\sum_{t=1}^{T} Z_{it}$ Where Z represents any of the panel variables including the idiosyncratic error term.

It is worth noting that time invariant variables such as the heterogeneity among cross-sectional units automatically drops from equation (3) following the transformation for fixed effects estimation. To take account of the heterogeneity, the Least Square Dummy Variable alternative to fixed effects estimation is necessary and the operational form of this model is specified in equation (4) below.

$$GDP_{\iota t} = \beta_0 + \beta_1 Eexp_{it} + \beta_2 Hexp_{it} + \beta_3 Dexp_{it} + D_i'\gamma + \mu_{it} \quad (4)$$

Where GDP_{it} is the growth rates of the various countries overtime, β_0 is the common intercept, $Edu_{it,}$ $Hexp_{it}$ and $Dexp_{it}$ are the cross-country expenditures overtime of the various countries in education, health and defense respectively measured as percent of gross domestic product (GDP) . β_1 - β_3 are the common slopes of the panel regressors with γ, the coefficients of the vector of dummies (D_i) capturing the cross-country heterogeneity for (N-1) countries.

Table 2: Results of the Hausman Test

Test Summary	Chi square stat
Cross-section random	24.9924 *** (0.000)

Source: Authors' calculation using EViews
Description: *** significant at 1%, ** significant at 5%, * significant at 10%

The results of the Hausman test is reported in Table 2. The null hypothesis underlying the test is that the random effects model is appropriate as against the fixed effect model. Based on the results in Table 2, the null hypothesis is rejected at even 1% level shown by the low probability values of the Chi-square statistic. This implies that the fixed effect model best fits the data under consideration. The fixed effect model is nothing but the OLS regression of the time-demeaned regressand on the time-demeaned regressor variables. For purposes of comparison among the countries in terms of how their expenditure in the various sectors affect growth, the Least Square Dummy Variable Approach (LSDV) to fixed effect estimation is fitted. For the eight countries selected for comparison in this study, (N-1) numbers of dummies were introduced to avert the danger of getting into the dummy variable trap (a case of perfect multicollinearity) Gujarati (2003). The results of the LSDV model are displayed in Table 3.

From Table 3, it can be seen that as a whole education and defense expenditure have significant positive effects on the growth of all the countries. Health expenditure on the other hand has a positive but insignificant effect on growth. The results from Table 3 further indicates that significant heterogeneous effects of human capital and defense expenditures on growth exist for four of these countries (Senegal, Ivory Coast, South Africa and Kenya). Whereas heterogeneity exists for the remaining countries (Ghana, Tanzania, Rwanda and Uganda), it is generally not statistically significant. The finding of significant heterogeneity is attributed to the fact that, based on the capacity of the individual countries, most Sub-Saharan

African countries have in recent years been paying varying levels of attention to the issues of human capital and defense. For instance, countries like Ghana, Kenya and South Africa have all recognized in tempo the importance of health and education for national development and are devoting large chunks of their budgets to making these services free for their citizens.

Table 3: Results of the Fixed Effects Model and LSDV Model.

	Fixed Effect Model	LSDV of Fixed Effect Model
Variable	Coefficient	Coefficient
Eexp.	1.0320*** (0.0035)	1.0320*** (0.0035)
Hexp.	0.0851 (0.6954)	0.0851 (0.6954)
Dexp.	1.5156** (0.0269)	1.5156** (0.0269)
Senegal		-2.8669** (0.0182)
Ivory Coast		-2.8330** (0.0219)
South Africa		-6.2348*** (0.0000)
Uganda		0.2334 (0.9044)
Tanzania		0.9224 (0.4288)
Rwanda		0.9023 (0.5462)
Kenya		-3.0256*** (0.0083)
Ghana		-0.0769 (0.9691)

Source: Authors' calculation using EViews
Description: *** significant at 1%, ** significant at 5%, * significant at 10%

The results of this research are in tandem with those obtained by Mallick et al. (2016) who found that education impacted growth in Asian countries positively and Bedir (2016) who established a positive relationship between health expenditure and economic growth for some selected developing countries. However, Mose et al. (2014) found that although human capital encouraged growth in East Africa, the values were not significant implying that the government should not prioritize investment in this sector as it contributes insignificantly to growth in the region.

The findings are also consistent with the views of Adam Smith (1776) of the classical economic thought who first brought out the role of talents acquired during apprenticeship as being significant to growth. The term however was later developed by Irving Fisher (1897) and has since been used extensively by different economists to stress that healthy and educated people are likely to contribute more

to the economic growth of an economy. Expenditure on defense, although not directly contributing to the economic activity, was found to have a positive impact on growth of the various economies by encouraging stability and peace thereby providing a safe environment for growth.

5. Conclusions and Policy Directions

This study investigates the existence of heterogeneity in the way human capital and defense expenditure impact economic growth in Sub Saharan African based on the analysis of the data for eight of these countries for the period 2004-2017. The key findings indicate that there is a positive combined impact on growth of expenditure in education, health and defense for all the countries under consideration albeit the effect of health expenditure is statistically insignificant. Four of the countries are further found to be significantly different in the way human capital expenditure and defense expenditure impact on their growth. With the findings showing a positive correlation between human capital expenditure and economic growth, this study recommends that Sub-Sahara African countries place extra importance on the issue of their human capital development as human capital has the potential of delivering a sustained level of growth in these countries. In this regard therefore human capital which is highly dependent on the health status and education levels of people Goldin, (2014) should not be taken lightly by these economies in their quest to realize higher levels of economic growth. This could be achieved by embarking on a policy of aggressive expansion in the educational and health infrastructure in these countries to cater for the educational and health care needs of the ever-increasing population. More attention should also be given to the quality of education and health care delivery which could be achieved by improving the standard of training of the personnel at the forefront of health and educational service delivery in these countries. These measures are critical for the general overhaul of the health and educational systems of countries in the SSA region which could help minimize the health and educational tourism among the citizens of these countries.

With the help of the LSDV alternative to fixed effects estimation, it was established that at least differences exist among some Sub-Sahara African countries in the way they pay attention to their human capital development due to the different stages these countries fall in their development endeavor.

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Determinants of Productivity and Profitability Performance of Smallholder Common Bean Producers in Central Rift Valley of Ethiopia

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Abstract

The Central Rift Valley of Ethiopia is known for its potential in production and marketing of common bean. However, there is inadequate information on determinants of productivity and profitability performances of smallholder common bean producers. Hence, this study was designed with the aim generating adequate information on the area. The study involves the cross-sectional household survey of 172 common bean producers in Shalla and Boset districts. Farm size, household size and non-farm income have a significant negative effect on the productivity of smallholder common bean producers. Whereas, experience, group membership, type of common bean produced and credit utilization have significant positive influence. A unit percent increase in farm size of smallholder common bean producers would decrease the probability of their profitability by 11 percent. On other hand, a unit percent increase in Tropical Livestock Unit and farming experience increase their probability of profitability by 4.7 and 26 percent, respectively.

***Keywords**: Common bean, Smallholder, Tropical Livestock Unit, Profitability*
***JEL Classification**: D24, D2*

Etiyopya Merkezi Rift Vadisinde Küçük Ölçekli Fasulye Üreticilerinin Verimlilik ve Karlılık Performansının Belirleyicileri

Özet

Etiyopya'nın merkezi Rift Vadisi, yaygın fasulye üretimi ve pazarlamasındaki potansiyeli ile bilinir. Fakat küçük ölçekli fasulye üreticilerinin verimlilik ve karlılık performansının belirleyicileri hakkında yetersiz bilgi bulunmaktadır. Buradan yola çıkarak, bu çalışma küçük ölçekli fasulye üreticilerinin verimlilik ve karlılık performansını etkileyen faktörleri araştırmak amacıyla tasarlanmıştır. Çalışma, Shalla ve Boset bölgelerinde fasulye yetiştiren 172 çiftçinin yatay kesit hanehalkı anketini içeriyordu. Araştırma sonuçları çiftlik büyüklüğünün, hanehalk büyüklüğünün ve çiftlik dışı gelirin küçük ölçekli yaygın fasulye üreticilerinin verimliliği üzerinde önemli olumsuz etkiye sahip olduğunu gösterir. Fakat deneyim, grup üyeliği, üretilen yaygın fasulye türü ve kredi kullanımının önemli pozitif etkiye sahip olduğu görülmüştür. Bu sonuçlara göre küçük ölçekli yaygın fasulye üreticilerinin çiftlik büyüklüklerinde yüzde birlik bir artış, karlılık olasılıklarını yüzde 11 azaltmaktadır. Diğer yandan, Tropikal Hayvancılık Birimi ve çiftçilik deneyiminde yüzde birlik artış, karlılık olasılıklarını sırasıyla yüzde 4,7 ve yüzde 26 artırmaktadır.

***Anahtar Kelimeler**: Fasulye, Küçük toprak sahibi, Tropikal Hayvancılık Birimi, Karlılık*
***JEL Sınıflandırması**: D24, D2*

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1. Introduction

Pulses are important crops in agricultural production, and are major sources of protein for most of the developing countries in the world. Pulses are considered as an input-saving and resource-conserving crops because of their biological nitrogen fixing ability. Hence, they reduce the requirements of inorganic commercial fertilizer (FAO, 2014). Pulses are used as a source of income in addition to their uses as the main sources of protein in cereal based diets. Large quantities of the grain legumes (pulses) are sold in urban centers locally and exported in the form of green dried and processed forms (Devid, 2016).

Common bean is among important pulse crops which produced for direct consumption in the world. It is produced in regions with different cropping systems such as Latin America, Africa, Middle East, China, Europe, United States and Canada. Common bean is produced as subsistence crop throughout Sub-Saharan Africa region (Jones, 1999). The crop is grown widely and largely consumed in most parts of central, eastern and southern Africa. It is grown on about 4.5 million hectares of land annually by most of the resource poor farmers and it is preferred grain legume due to its early maturity (PABR, 2008). Common Bean is an important source of cash income for most of smallholder farmers in Africa and providing marketable product at the critical times when farmers have nothing to sell (Charles et al., 2004).

Common bean, known as haricot bean is an important crop to the Ethiopian national economy and to farmers as food and cash income. It used as an important source of foreign income for more than 50 years in Ethiopia (Ferris and Kaganzi, 2008). Common bean is ranked as the second largest pulse crop in the country in terms of production with share of 17 percent, next to Faba beans (Negash, 2007). Fast maturing characteristics of the crop enables the farm households to generate cash income that is required for purchase food and other household needs when other crops have not yet matured. Therefore, the crop is highly preferred in providing a quick cash for the risk prone farm households (Beshir and Nishikawa, 2012).

Common bean is grown widely in different parts of Ethiopia namely Oromia (East shoa, East Hararghe, West Hararghe and west Arsi zone) and SNNPR (Wolaita, Sidama, Gedeo, Alaba, Dauro and Guraghe zones). About 1,508,230.37 quintals of white bean and 3,374,971.33 quintals of red bean are produced on 88,302.71 and 200,334.52 hectares of land, respectively at the national level (CSA, 2018). About 318,085.99 quintals of white bean and 99,381.36 quintals of red bean are produced on 20, 289.93 and 5913.56 hectares of land, respectively in East shewa zone. 228,170.37 quintals of red beans are produced on 15,382.63 hectares of land in west Arsi zone in 2018/19 growing season (CSA, 2018).

Central Rift Valley Areas of Ethiopia is considered as the potential sources of common bean. The production of white bean type is common in the area. About 18% to 30% of farm land is allocated to common bean production and 86% of the product is sold in major common beans producing districts of the central rift valley areas (Atnaf et al., 2015). Nonetheless the immense potential of common bean

production in the area, no adequate information is available on factors determining the productivity and profitability performance of smallholder common bean producers. In Ethiopia, efforts for achieving accelerated and sustained economic growth are geared to sustainably increase the productivity of the agricultural sector by improving the role of farmers in attaining better food security and incomes (MoFED, 2010). In the attempt to enhance the growth and development concerns of the agricultural sector, there is a need to provide information on determinants of productivity along with the profitability of the major agricultural commodities. Identifying the determinants of productivity and profit accruing to bean producers is likely to provide important information that is essential for understanding the economics of bean production, policy formulation, improving bean production and productivity, and income of smallholder farm households. This research was therefore, intended to generate important information on determinants of productivity and profitability performance of smallholder common bean producers in central rift valley of Ethiopia on the basis of cross-sectional household survey conducted in 2018 in Shalla and Boset districts.

2. Literature Review

A number of socioeconomic and institutional factors have been identified to influence the profitability of agricultural production at the farm level. The study conducted by Sulumbe et al. (2010) on the profitability of cotton production under sole-cropping in Nigeria showed that family size, house holds' annual income and extension service were positively related to cotton output and profitability. According to Mulgeta (2011), household with large livestock holding can have an alternative cash sources which used to improve the productivity and profitability. Techane et al. (2002), reported that house households with larger tropical Livestock Unit have better economic strength to improve their farm profitability. The experience in crop production found to have an effect on the productivity and profitability status of smallholder farm households. According to Lawal et al. (2013) and Okoli et al. (2015) farming experience positively affected on farm productivity and profitability. Group membership is another important factor which determine the productivity and profitability of smallholder farmers. The research by Birachi et al. (2011) and Owuor et al. (2004) showed that group membership had a significant positive effect on output produced and farm profitability, since the farmers in group member can easily access extension services and agricultural inputs than being alone.

In a study conducted by Lowenberg-DeBoer and Ibro (2008) on the value chain of cow pea in Nigeria, it was found that businesses operating at a greater scale earned more per input. Neither experience nor education was found to be a strong predictor of profitability. However, this study focused on the traders with the exclusion of cow pea producers. Even though traders represent an important part of the cowpea supply chain, there is a need to determine the value accruing to producers of cow pea. According to the study conducted by Katungi et al. (2011) on cost benefit analysis of farmer-based common bean seed production in Kenya; it was found that the average variable cost of producing bean seed was US$ 388 per hectare and the

costs on items such as use of chemicals in seed treatment before storage, rouging and plant protection accounted for a smaller share (about5%) of the variable costs because most of the producers did not apply the practices. This study further suggests that farmer-based seed production enterprises were likely to be more sensitive to yield than price fluctuations. A 10% reduction in the price of seed reduced the profitability by about 1%, while a similar increase in yield increased profitability by 10%. This implies that huge change in price affect the profitability of farmer-based common bean seed production significantly; while a slight change in yield can have a significant impact on the enterprise profitability. However, the finding of this study is not comprehensive since it focuses only on common bean seed production profitability, while excluding most of the farmers engaged in common bean grain production. Hence, it is necessary to include common bean grain in the study in order to have good picture on common production profitability.

The research by Saimon (2016) on factors influencing on-farm common bean profitability of smallholder bean farmers in Babati District of Tanzania, shows that, age of respondents, gender of respondents, common bean yield, selling price, extension service, access to credit and off-farm income are factors determining common bean on-farm level gross margin (profit). According to this study unit increase in common bean yield led to an increase in profit margin by 0.29613 units at 1% level of significance. A unit increase in farm-gate price also led to an increase in the profit margin by 0.14054 units. This implies that a unit increase in selling price led to increased profit margin of smallholder farmers. In addition to this, the study results show that, access to credit had a positive effect on profit margin. A unit increase in the credit accessed by common bean producer causes profit margin to be increased by 0.32619 units at 10% level of significance. Credit facilitates the introduction of innovative agricultural technologies, ensures input and output marketing arrangements and enhance productivity and farm profitability. However, it is unclear as to whether the same factors apply to the central rift valley of Ethiopia. Therefore, there is a need to conduct a research to assess whether these factors of common bean productivity and profitability can be applied to the focus area of this study or not.

3. The Research Methods

3.1. Description of the Study Area

This study was conducted in central rift- valley region of Ethiopia, particularly in Shalla and Boset districts. Shalla is located in western Arsi zone of the central rift valley of Ethiopia. The zone is known by the production of different cereal crops like teff, barley, wheat, maize, sorghum and finger millet. Faba beans and common beans are among the pulse crops produced in the area. 542,621.05quintals of common bean was produced form 29,011.14 hectares of land in the zone during 2015/16 growing season (CSA, 2015/16). The district is situated about 270 km south west of Addis Ababa. The area is lowland with an altitude of 1550m above sea level, with latitude of 38° 27’10.9’’E and Longitude of 7°17’08.6’’N. The site has mean maximum temperature of 29.2°C and mean minimum temperature of 14.4°C. The soil texture is sandy loam and the site receives 763 mm mean annual

rainfall, but with much variation in distribution and amount of 70% which occurs between the months of May and September.

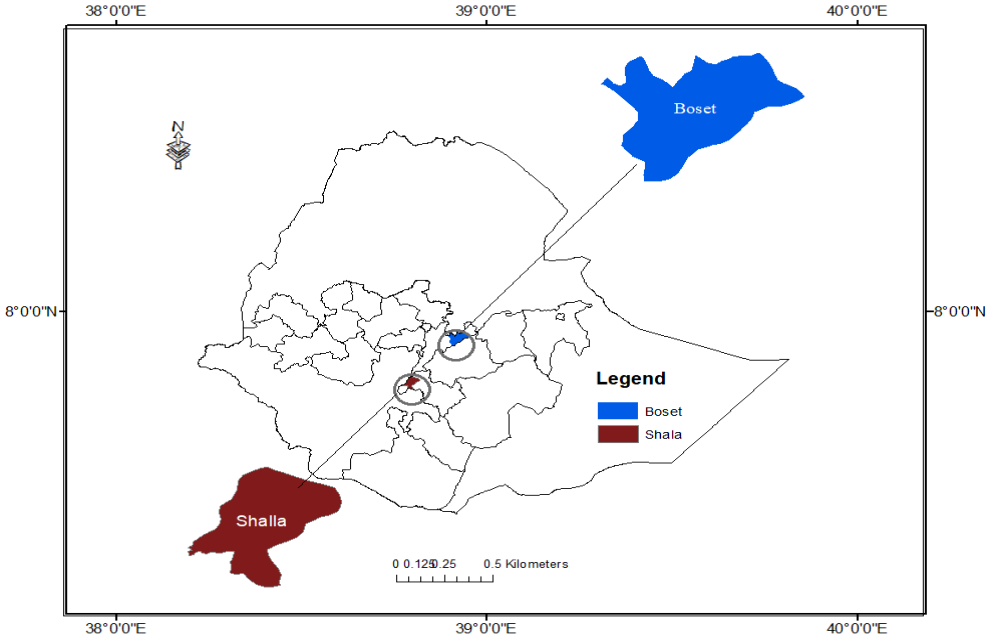

Figure 1. Map of the study area
Source: Own Computation

As indicated on the figure 1, Boset district found in east shoa zone of Oromia regional state within the central rift valley of Ethiopia. Different cereal crops like teff, barley, maize and wheat and pulse crops such as Faba beans, field peas, common beans, chick pea and lentils are commonly produced in the area. 103, 105.98 quintals of common bean were produced form 8,633.13 hectares of land in the zone during 2015/16 growing season (CSA, 2015/16). Boset district is located on the distance of 25 km from Adama and 125km from Addis Ababa in east shewa zone. The district is located between 1400m-2500m above the sea level and rests on area of 151,406 hectares. It gets 600-900mm annual rain fall on average. Agriculture is the main economic activity of this district in which most of farm households are engaged in the production of major cereal crops, pulses and horticultural products.

3.2. Sources of Data and Methods of Data Collection

Both primary and secondary data were collected to attain the research objectives. The main source of data for the research is cross sectional household survey of the common bean producers in the central rift valley region conducted in 2018. Hence, the smallholder farm households were the primary data source. Secondary data was obtained from various sources such as previous research findings, proceedings, journals and other sources which were relevant for this study.

Structured questionnaire was the primary data collection tool for the household survey. Enumerators were given training and briefings on the objective, contents of

the questionnaire and were also acquainted with the basic techniques of data gathering, interviewing and on how to approach farmers. Primary data was collected through face-to-face interview of the sample households using structured questionnaire which was filled up by recruited and trained enumerators under the close supervision of the researchers or supervisors.

3.3. Sampling Design and Sample Size

Major common bean producing areas were considered for the study. Purposive sampling technique was used to identify the major common bean growing areas in central rift valley of Ethiopia. Western Arsi and East Shewa zones of the Oromia regional state are the major common bean growing zones in central rift valley of Ethiopia from which major common bean producing districts were selected. Major common bean growing districts in these zones were selected purposively depending on the area coverage of common bean production. Accordingly, Shalla and Boset districts selected from the Western Arsi and East Shewa zone, respectively. Then the major common bean growing kebeles in each district were identified based on the area of common bean production. Based on the information from each district Agriculture and Rural Development Office, Awara Gama and Chefa Kerensa kebeles from shalla, and Sara Areda and Kachachule kebeles from Boset district were selected purposively for this study.

Simple random sampling technique was employed in order to draw common bean growing farm households. Total population of common bean growing farm households was identified in each kebeles. In the two districts, 1109 common bean producing smallholder farm households were identified of which 582 from shalla and 527 from Boset district. Proportionate sampling technique was employed to calculate or determine the number of common bean producers sampled or drawn in each district and kebele. According to Yamane (1967), the sample size determined as follows:

$$n = \frac{N}{1+N(e)^2} \quad (1)$$

Where n is the sample size, N is a target population of common bean producers, e is the level of precision. Based on this formula, the sample size of common bean producers for (N) =1109 at e = 0.07 is:

$$n = \frac{1109}{1+1109(0.07)^2} = 172 \quad (2)$$

Based on the proportional sampling technique, from the total sample of 172 smallholder farm households, 90 were selected from shalla district, out of this, 49 samples were taken from Chefa Kerensa whereas 41 samples were from Awara Gama Kebele. Similarly, out of 82 samples taken from Boset district of which 49 samples were taken from Sara Areda and 33 were from Kachachule kebele, were the sample sizes considered. Finally, the sample farm households were drawn randomly using simple random sampling technique.

3.4. Methods of Data Analysis

Descriptive statistics was used to describe the household information. Independent two sample t-test was also employed to examine the difference in productivity among the smallholder common bean producers. Econometric analysis (OLS) was used to estimate the factors influencing the productivity of smallholder common bean producers. Whereas, Binary logit model was employed to identify factors affecting relative likelihood of farmers' profitability in common bean production.

3.5. Model Specification

The method of Ordinary Least Square (OLS) was used to analyze factors affecting common bean productivity. According to (Wooldridge, 2012), OLS method is more amenable to ceteris paribus analysis because it allows us to explicitly control for many other factors that simultaneously affect the dependent variable. It allows many observed factors to affect the dependent variable thus allowing for much more flexibility. Hence, OLS method is appropriate to estimate the parameters of multiple linear regression model. Multiple regression equation, involving the use of ordinary least square (OLS) is used to examine the magnitude and direction of the effect of independent variables on the response variable. The multiple regression equation with four different functional forms stated as follows:

$$Y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \cdots \beta_k x_k + \mu_t \quad \textit{(Liner)} \quad (3)$$

$$Y = \beta_0 + \beta_1 lnx_1 + \beta_2 lnx_2 + \beta_3 lnx_3 + \cdots \beta_k lnx_k + \mu_t \quad \textit{(Semi-log)} \quad (4)$$

$$lnY = \beta_0 + \beta_1 lnx_1 + \beta_2 lnx_2 + \beta_3 lnx_3 + \cdots \beta_k lnx_k + \mu_t \quad \textit{(Double log)} \quad (5)$$

$$lnY = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \cdots \beta_k x_k + \mu_t \quad \textit{(Exponential)} \quad (6)$$

Where Y is dependent or response variable; productivity (production in quintal per hectare) in this case, Xs are explanatory variables affecting productivity of common bean production, β_0 is the constant or intercept, the betas i.e. β_1, β_2, β_3 ..... β_k represent the regression coefficients that show the partial effects of the corresponding explanatory variables and Ɛt represent an error term.

Binary logit model was employed to analyze factors affecting the farmers 'profitability performance (probability of smallholder common bean producers' profitability) in central rift valley of Ethiopia. According to Hosmer and Lemeshow (2000), logistic regression model is preferred when the outcome variable is dichotomous (binary). Agresti (2007) also stated that logistic regression is appropriate when dependent variable is binary and the independent variables are continuous and mix of categorical and continuous. Furthermore, logistic regression model was preferred, since it has simpler functional form than probit model (Guajarati and Sangeetha, 2007). Therefore, logistic regression model was employed in this study to envisage the relative likelihood of farmers' profitability in common bean production in central rift valley of Ethiopia.

Dependent variable takes the value of '1' if farmer is profitable (gain) in common bean production and '0' for failure (loss). The parameter (coefficient) of each independent variable was used to estimate the marginal effect of the corresponding

independent variables on the outcome variable. The marginal effect of each explanatory variable shows the extent and direction of the influence of each variable change on the response variable. The model was specified as follows:

$$Y = 1 \quad if\ NFI^* > 0 \tag{7}$$

$$Y = 0 \quad if\ NFI^* < 0 \tag{8}$$

Where NFI* represent the common bean Net Farm Income per hectare. Following Sadiq et al. (2013) and Ogisi et al. (2013), Net Farm Income was used as a proxy to determine the profitability status smallholder farmers. The data across all observations takes the value less than and greater than zero. Thus, the dependent variable takes the value of 1 if the farmer is profitable or gain (NFI >0). Y_i takes the value of 0 for loss. This indicates that the farmers fail to cover their cost of production, since the total revenue below the total cost of production (NFI<0). The fundamental equation of logistic regression was stated as follows.

The probability of the farmers to gain (have positive net margin) is given by:

$$P(Y = 1/X_i) = exp^{(X_iB+\mu)}/[1 + exp^{(X_iB+\mu}] \tag{9}$$

Similarly, the probability of the farmers to loss (have negative net margin) is represented as:

$$P(Y = 0/X_i) = 1 - \{[exp^{(X_iB+\mu)}]/[1 + exp^{(X_iB+\mu}]\} = 1/\,exp^{(X_iB+\mu)} \tag{10}$$

The logit regression equation reveals that when the value of each explanatory variable increased by one unit (percent), all other variables held constant, the odds ratio (probability ratio of **p/1-p**) given as:

$$P/1 - p = \{[exp^{(X_iB+\mu)}/1 + exp^{(X_iB+\mu)}]/[1/exp^{(X_iB+\mu}]\} = exp^{(X_iB+\mu)} \tag{11}$$

Hence, the logit transformation of the odds that the farmers are gain (have positive net margin) in their common bean production **(**$p(y=1/x_i)$**)** is expressed as:

$$Logit(Y_1) = ln\,[\,p\,(Y = 1)/\,(1 - P\,(Y = 1))] = \beta_0 + \beta_1 x_1 + \beta_2 x_2 +$$

$$\beta_3 x_3 + \cdots + \beta_k x_k + \mu_t \tag{12}$$

Where,

P(Y=1) is the probability of having positive net margin(gain) and 1-p(Y=1) the probability of having negative net margin(loss) of the i^{th} farmer.

Y=1 if the farmer is having positive net margin(gain) in common bean production and '0'otherwise.

β_0 = Intercept (constant)

$\beta_1, \beta_2, \beta_3 \ldots\ldots\ldots, \beta_k$ = coefficients indicating the marginal effect of the corresponding explanatory variables on net margin of smallholder common bean producers.

$X_1, X_2, X_3 \ldots, X_k$ = Explanatory variables assumed to affect the net margin of farmers in common bean production.

μ = Error (disturbance term)

Ln [P(Y=1)/ (1-P(Y=1))] = the natural logarithm ranges from negative infinity to positive infinity.

3.6. Fitness Tests for Different Functional Forms in Multiple Regression Model

In selecting the function that best fit to the data, different criterion like Akaike's Information Criteria, Bayesian Information criteria(BIC), the value of F-ratio and its p-value, the value of coefficient of determination(R^2) and the number of significant variables are used following (Guajarati and Sangeetha, 2007). The function with the lowest value of AIC, BIC and p-value; highest value of F-ratio and R^2, and with a higher number of significant variables is best fit to the data. The double log function was eventually selected since it fulfills most of the criterion relative to the rest three functional forms of the regression equation (See Appendix Table 1). On the other hand, this means the data was best fit to the regression equation in double log function. Hence, the regression model in double log function applied to analyze factors affecting the productivity of common bean production.

3.7. Regression Diagnostics in Multiple Regression

Shapiro-Wilk and Skewness/Kurtosis (sktest) were employed on error term to check the distribution of data. The tests were not significant at 5% level of significance. Hence, the data was normally distributed. The non-significant Breusch-Pagan test result shows that there was no heteroskedasticity problem in the data set. On the other hand, the Ramsey Regression Specification Error Test (RESET) employed to detect the presence of the problem of functional form misspecification. The insignificant test value shows that all of the independent variables are exogenous (no independent variable suffers from an endogeneity problem) and there is no omitted variable from the model while it significantly affects the dependent variable. Hence, the model is specified correctly. The Variance Inflation Factor of each explanatory variable was very small and less than 10.00 with the mean VIF of 1.32 (See appendix Table 2). Thus, there was no evidence of the presence of multicollinearity problem in the data set.

3.8. Regression Diagnostics in Logistic Regression

The existence of multicollinearity among independent variables for all continuous and discrete variables was checked before running the logistic regression. Variance Inflation Factor (VIF) and contingency coefficients were used to check the degree of correlation among the continuous and discrete independent variables, respectively. According to Gujarati (2004), the Variance Inflation Factor is used to check multicollinearity among continuous independent variables by which each continuous explanatory variable was regressed on all other continuous explanatory variables. As the rule of thumb, the VIF exceeds 10 shows high degree of correlation among the independent variables. The mean value of VIF for the

continuous explanatory variables included in the model was less than ten (Mean VIF = 1.064). This shows that multicollinearity was not a serious problem in the analysis (See Appendix Table 3). Contingency coefficient is a chi-square-based measure of correlation among the dummy explanatory variables. The value of contingency coefficient above 0.75 revealed a strong correlation among explanatory dummy variables (Healy, 1984). The contingency coefficients of all explanatory dummy variables considered in the model were less than 0.75 which implies that there was no serious multicollinearity problem among discrete explanatory variables (See Appendix Table 4). On the other way, the insignificant result of the Link test indicates that there was no model misspecification problem in the logistic regression analysis (Appendix Table 5).

4. Result and Discussion

4.1. Socioeconomic Characteristics of the Farm Households

The result of the descriptive analysis shown in Table 1 indicates that from the overall sample farm household in the study area, 75% were male-headed households whereas, 25% were female-headed households. From the total sample households, 58.7% have grown common beans during the production season. From the total of 172 sample smallholder common bean producers, most (66.3%) were lack the access to agricultural extension visit. Only small percentage (33.7%) of the total sample were accessed the agricultural extension visit. From this it is deduced that most of smallholder common bean producers lack access to agricultural extension visit. As shown in Table 1 below, Majority of the households in the study areas had no access to training on common bean production. Only 26.2% of the sample households have access to training on common bean production in 2009/10 growing season (Table 1).

Table 1. Socio Economic Characteristics of the Farm Households

Characteristics		Shalla		Boset		Total Number	(%)
		Number	(%)	Number	(%)		
Gender	Male	62	68.9	67	81.7	129	75
	Female	28	31.1	15	18.3	43	25
	Total	90	100	82	100	172	100
Extension Visit	Yes	30	33.3	28	34.1	58	33.7
	No	60	66.7	54	65.9	114	66.3
	Total	90	100	82	100	172	100
Land Ownership Under Bean	Own	47	52.2	54	65.9	101	58.7
	Not Own	43	47.8	28	34.1	71	41.3
	Total	90	100	82	100	172	100
Training Access	Yes	22	24.4	23	28.1	45	26.2
	No	68	75.6	59	71.9	127	73.8
	Total	90	100	82	100	172	100

4.2. Type of Common Bean Produced

Various varieties of common bean were produced in Central Rift Valley of Ethiopia. Naser, Awash-1, Awash-2, Dinkinesh and Mexican-142 were the common bean varieties produced by the households in the areas. Naser and Dinkinesh are the red type common bean varieties which mostly produced in shalla, while Awash-1 and Awash-2 are white common bean types commonly produced in Boset district. Mexican-142 is the old varieties which was in the hand of the farmers for relatively longer period of time. It produced by some of the farmers in both districts. From the total sample of the households, 39% produce Awash-1 variety and 27.3 % produce Naser variety. About 15.1% and 2.9% produce Dinkinesh and Mexican-142 respectively. Only 2.3% of the sample households produce wash-2. On top of this, 10.5% were produce both Naser and Dinkinesh variety. Those who produced both Awash-1 and Awash-2 accounts for only 2.9% of the total sample. The proportions of households that produce each common bean varieties are well illustrated on the figure 2 below.

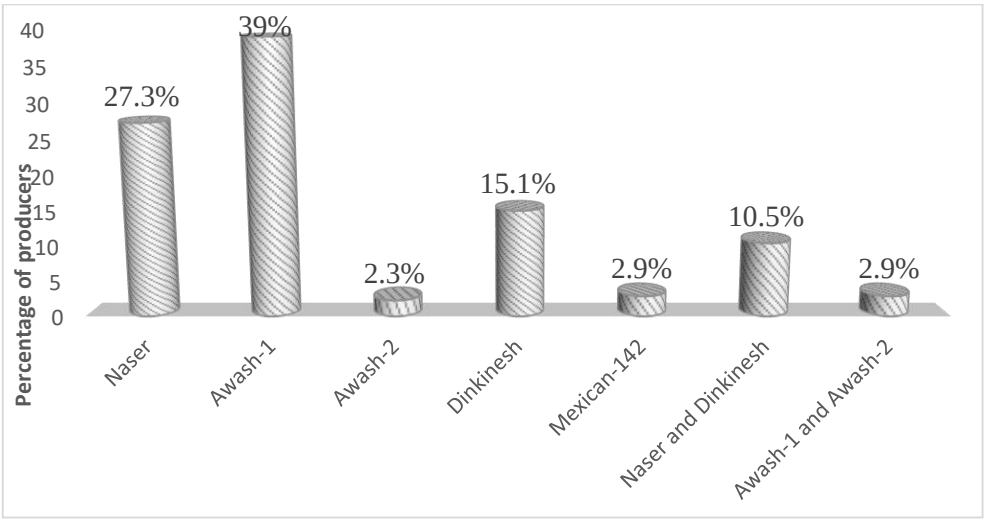

Figure 2. Varieties of Common Bean Produced by the Smallholder Farmers
Source: Survey data

4.3. Common Bean Market Destination

The farm households had different category of market destination for their common bean. Farm gate level, village market, district market and zonal market were the main categories of common bean market destination in the study area. The common bean market destination for the majority (48.8%) of the sample farm households was the village market. 23 and 18.4% were sold their produce at the farm-gate and zonal market respectively. The rest 9.8% of common bean producers were used the district market for their common bean marketing. This implies that the village market is the main common bean market destination of the smallholder farmers in central rift valley of Ethiopia. (Figure 3).

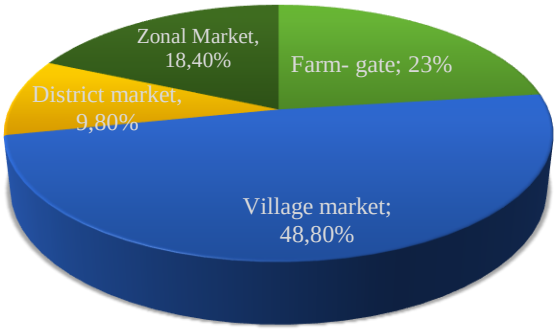

Figure 3. Common Bean Market Channels
Source: Survey data

4.4. Difference in Common Bean Productivity Among the Farm Households

Table 2 shows the difference in mean common bean productivity among the smallholder common bean producers depending on their different characteristics. The significant difference in common bean productivity existed between the profitable and non-profitable farmers. Profitable farmers had significantly higher common bean productivity than non-profitable farmers. The mean difference between the group is 4quintals per hectare which significant at1% level of significance. This shows that the profitability performance of farmers contributes to their productivity. There was a significant difference in common bean productivity among the smallholder farm households depending on their membership to Common Bean Seed Producers' Group. Mean common bean productivity of the group members and non-members was 23.1 and 16.3 quintals per hectare(table2). The productivity difference between the groups was 6.80 quintals per hectare which was statistically significant at 1% level of significance ($p<0.01$). This reveals that the productivity of the common bean seed producers' group members was significantly higher than that of non-members.

Table 2. The Difference in Common Bean Productivity Among the Smallholder Farmers

Variable	Comparison	Mean	Mean difference	t	Sig.
Profitability	Profitable	20	4.00	4.120	0.000
	Non-Profitable	16			
Group membership	Member	23.1	6.80	9.969	0.000
	Non - member	16.3			
Credit	Credit user	23.6	6.40	8.099	0.000
	Non-user	17.2			

Source: Survey data

Likewise, there was a significant difference in common productivity among the farm households who use and not use credit. The productivity of the farmers who used credit is significantly higher than that of non-users. This could be due the reason that, the use credit for purchase of adequate inputs of production including quality seed can improve productivity.

4.5. Determinants of the Productivity of Smallholder Common Bean Producers

The multiple regression result shows that estimated F-ratio was 48.88 and it was statistically significant at 1%level of significance, since the probability of F-statistic was very small (Prob>F = 0.0000). This implies that the model was statistically significant, thus the joint effect of all explanatory variables on common bean productivity is not zero. The Adjusted R squared of 0.72 implies that 72% of the variation in common bean productivity explained by the explanatory variables estimated in the model. As indicated in table 3, farm size, family size, number of years of experience in common bean production, common type produced, membership to Common Bean Seed Producers Group, credit utilization and nonfarm income were explanatory variables affecting common bean productivity at different significance level.

As shown in table 3, unit percent increase in farm size of the smallholder farm households decreases their common bean productivity by 4.6 percent. This might be due to the reason that managing larger farm is difficult relative to the management of small farms. The result is in conformity with Haggblade et al. (2010) who reported that large farms yield lower output and returns relative to small farms due to more input demand and an increasing production costs under large farms.

The result shows that family size affects common bean productivity negatively. One percent increase in family size decreases common bean productivity by 10.7 percent (table 3). The effect is highly significant at 1% level of significance($P<0.01$). This might be due to the reason that an increased use of household income to meet the family consumption demand limit funds for purchase of inputs and improved seed which used to improve common bean production and productivity. The result agrees with Ahuja (2000) who found the negative relationship between productivity and household size. According to the author, family size negatively affects productivity due to diminishing marginal returns to labor and large proportion of non-active family members in the household who do not participate in the production activities. The finding coincides with also Oband Mabvut (2012) who reported that household size negatively affects the productivity and profitability of cassava production in Chongwe district of Zambia, since the increased use of household income for the growing family consumption leads to poor investment on crop production.

Experience in common production affects common bean productivity positively with a coefficient of 0.635. Hence, for a unit increase in number of years of farmers' experience in common bean production, common bean productivity will increase

by 63.5 percent (table 8). The result of this study fits with the research by Lawal et al. (2013) and Okoli et al. (2015) who reported that the positive effect of farming experience on farm productivity. Likewise, the type of common bean produced have a significant effect on common bean productivity. The farmers producing red beans are 6.1 percent more productive than those farmers producing white beans. This could be due to the higher yield potential of red beans. However, white beans had better market value and profitable than red beans, since they are highly demanded on export market whereas, domestic consumption is the major market for red beans (Ferris and Kaganzi,2008).

Group membership have a significant positive influence on the productivity of common bean. Common bean productivity of farmers who are the member to Common Bean Seed Producers is significantly higher than that of non-member. The productivity of group members is 11.8 percent higher than non-members. The result concurs with Birachi et al. (2011) and Owuor et al. (2004) who reported that group membership had a significant positive effect on output produced and farm profitability, since being a group member can facilitate the condition for easy access of extension services and other necessary agricultural inputs than being alone.

Table 3. Common Bean Productivity Determinants of Smallholder Producers

Variable	Regression Coefficients	Robust Std.Err	t values	P values
Gender	0.028	0.057	0.48	0.629
Farm size	-0.046	0.024	-1.9	0.059*
Distance to nearest market	-0.007	0.014	-0.51	0.61
Family size	-0.107	0.025	-4.31	0.000***
Experience	0.635	0.059	10.67	0.000***
Common bean types	-0.061	0.029	-2.12	0.035**
Group membership	0.118	0.032	3.70	0.000***
Credit utilization	0.062	0.031	1.95	0.053**
Non-farm income	-0.018	0.010	-1.79	0.075*
Constant	1.346	0.185	7.30	0.000

*=Significant at 10%level **= Significant at 5% level ***= significant at 1% level Adj.R2 =0.72
F= 48.88 Prob>F = 0.0000 Number of obs = 17

Credit utilization is one of the important variables that affects the common bean productivity in the study areas. The result shows that the productivity of credit user is 6.2 percent higher than non-users. This could be due to the reason that reason that the use of credit enabling the farmers to purchase improved varieties, increase farmers' inputs use and hence, increase productivity and farm output. The result is in accord with Luoga et al. (2007) who reported that access to credit enables the farmers to use improved agricultural inputs and hence increasing their farm output and profit. Furthermore, non-farm income is the other determinants of common bean productivity of smallholder common bean producers. A unit percent increase in non-farm income of the household will decrease the common bean productivity of the smallholder farm households by 1.8 percent. The finding in line with Simon,

et al. (2011) who found the negative effect of non-farm income on the productivity and farm profitability of common bean production in Babati district of Tanzania. According to his study, as farmers owns a more rewarding non-farm income generating activity, the more they concentrate to that business and light-touches the common bean business which can, therefore, lead to low production, productivity and farm profit profitability.

4.6. Determinants of the Profitability Performance of Common Bean Producers

The parameters of the logistic regression model were used to identify the factors influencing the profitability performance of smallholder common bean producers. The result of logistic regression model showed significant Likelihood ratio (LR), since the value of calculated Likelihood ratio (LR) was 34.77 which was greater than the critical value of Likelihood Ratio (LR=16.919). This implied the statistical significance of the fitted logistic regression**.** Moreover, the probability greater than chi-square value (Prob >chi-square=0.0001), suggested that all of the model parameters were jointly significant in explaining the dependent variable at 1% level of significance which showed the goodness of fit of the model (table 4). From the result of the logistic regression illustrated in table 4, it is shown that five out of fourteen explanatory variables were found to have a significant influence on the probability of farmers' profitability (profitability performance). Farm size, number of livestock (TLU), experience in common bean production, participation in collective marketing and common bean type were the explanatory variables that affected probability of farmers' profitability from their common bean production. The marginal effect of each explanatory variable was discussed in detail one by one as follows.

Farm size of the household had negative effect on the profitability performance of smallholder common bean producers. Unit percent increase in farm size of the household would decrease the probability of farmers' profitability in common bean production by 11 percent. This could be due to the reason that it is difficult to properly manage large farms in relative to small farms. Hence, poor management and additional input costs on large farms would be the cause for low profit from large farm. The result is in conformity with (Haggblade et al., 2010) who found that large farms yield lower returns relative to small farms. This could be due to the reason that an increasing area under production must be accompanied by an increase in production costs since more inputs are needed.

A unit percent increase in Tropical Livestock Unit (TLU) would increase the probability of farmers' profitability from common bean production by 4.7 percent (Table 4). This could be due to the reason that farmers with large TLU can have alternative cash sources which used to purchase the adequate amount of inputs for production. The result is in line with Mulgeta (2011) who reported that households with large livestock holding can have good access to more drought power and have also alternative cash sources to purchase the necessary inputs of production. Thus, they improve their agricultural production and farm profitability by using the income from livestock and livestock products. Techane et al. (2002) also reported

that households with larger TLU have better economic strength and financial position to purchase the sufficient amount of agricultural inputs and improve their farm profitability.

Unit increase in farmer's years of experience in common bean production leads to 26 percent increase in the likelihood of the farmers to be profitable from their common bean production. This could be due to improvement in production skill of the farmers through years. The result agrees with Okam et al. (2016) who reported that more experienced farmers have better production skills which associated with higher productivity and farm profitability.

Table 4. Marginal Effect of Factors Affecting the Performance of Common Bean Producers

Variable	Marginal effects (β = dy/dx)	Standard. Error	z values	Probability (P >|z|)
Gender of the household head*	0.216	0.141	1.53	0.126
Family size	-0.009	0.008	-1.18	0.237
Farm size	-0.110	0.060	-1.84	0.065*
Non-farm income	0.009	0.020	0.44	0.658
Livestock (TLU)	0.047	0.027	1.75	0.08*
Experience	0.260	0.115	2.26	0.024**
Distance to nearest market	0.015	0.040	0.38	0.707
Participation in collective marketing*	0.163	0.060	2.72	0.007***
Common bean type*	0.249	0.065	3.84	0.000***
Log-L = -66.769 Pseudo R2 = 0.2433 LR chi2(9)=34.77 Prob>chi2 = 0.0001				

Number of obs =172 ***= significant at 1% level **= significant at 5% and *=significant at 10%, (*) dy/dx is for discrete change of dummy variable from 0 to 1

The result indicates that participation in collective marketing was positively and significantly affected the profitability performance of smallholder common bean producers in central rift valley of Ethiopia. The shift from non-participant to participant in collective marketing would increase the probability of profitability by 16.3 percent (table 4). This could be due to the reason that participants in collective marketing can easily access a market for their product, agricultural inputs and other extension services more easily than being alone. The result further shows that those farmers producing white bean were more likely to profitable than those producing the red bean types. The production of white beans is 24.9 percent more likely to profitable than production of red bean types. The result agrees with Ferris and Kaganzi (2008) who reported that white beans have better market value than the red bean types. According to their findings the leading white beans including Awash-1 are produced exclusively for the export market, since they are popular in industrialized nations like United States, United Arab Emirates and United Kingdom (UK). Hence, the market value of white beans higher relative to read beans.

5. Conclusion, Recommendations and Areas for Further Studies

5.1. Conclusion

The central rift valley region of Ethiopia had a huge potential for wide varieties of common bean production and marketing. The white bean types such as Awash-1, Awash-2, Mexican-142, and red bean types like Naser and Dinkinesh were among the major common bean varieties produced in the region. The majority of the sample farm households used village market for their common bean production. Only small portion of the sample were sold their common bean to the district and zone market. The significant difference in common bean productivity is existed among the smallholder farmers based on their profitability status, group membership and credit utilization. The common bean productivity is higher for profitable farmers than non-profitable farmers. This shows, profitability status contributes to the productivity of the farmers in common bean production. The common bean productivity of those farmers who are member to Common Bean Seed Producers' Group and utilize credit is significantly higher than non-member and non-credit users, respectively.

Despite the potential of the central rift valley of Ethiopia in common bean production and marketing, there exists different factors which influence the productivity and profitability performance of smallholder common bean producers. Farm size, family size and non-farm income are significantly and negatively affecting the common bean productivity, whereas, experience in common bean production, group membership and credit utilization have a significant positive effect on the productivity of common bean under smallholder-based production. The productivity of the farmers producing white bean is less than those producing red beans.

Farm size, number of livestock (TLU), experience in common bean production, participation in collective marketing and common bean type were among the factors that significantly influence the profitability performance of smallholder common bean producers. Farmers with a large farm size are less likely to be profitable from their common bean production. This could be due to the difficulties in managing larger farms and increasing in cost of production on larger farms than small farms. Farmers with larger livestock (TLU) are more likely to be profitable from their common bean production, since they used their livestock and livestock products as an alternative source of income for purchase of different agricultural inputs. On the other hand, farmers with many years of experience in common bean production are more likely to be profitable from their common bean production. The producers participating in collective common bean marketing are more likely to fetch higher profit than non-participant. On top of this, the profitability performance of the farmers is significantly influenced by the type of common bean produced. Farmers producing white beans are more likely to be profitable than those producing red beans.

5.2. Recommendations

The study recommends the government to implement policies that enhances the farmers' profitability and productivity. It is difficult for farmers to support large family with limited production. Hence, it is imperative to integrate family planning with health extension service in the study area. Government and other stakeholders operating to improve the welfare of the rural society should introduce the credit service providing institutions in order to provide the farmers with an alternative financial source and improving their agricultural productivity and farm profitability. Facilitating market access in rural areas like establishment of farmers' cooperatives and farmers' collective marketing is important to help the small holder farmers to negotiate better prices for their product. Creating awareness among farmers on business diversification like livestock production besides the production of crop is necessary to support their crop production with an alternative income sources and to minimize the natural and market related business risks. Establishing village-based farmers' group with a greater experienced farmers' participation is important and unexperienced or less experienced farmers can therefore, benefited from the well experienced farmers' innovative skill and techniques of production and thus improved their productivity and farm profitability. To improve the profitability of red beans producers the government should promote formal exportation of red beans as white beans through investment incentives to local and foreign companies. To sum up, it is necessary to integrate the essential policy measures to add to the positive and conquer the negative influence of the identified factors and the productivity and profitability of the smallholder farm households can, therefore, enhanced in the study area.

5.3. Areas for Further Studies

Although the study plays significant role in providing an information on the productivity and profitability analysis of common bean production, it concentrates only on the smallholder common bean producers. Thus, productivity and profitability of common bean under large scale production should be the areas of further research. The study further focused on the productivity and profitability of common bean grain production with much to the exclusion of common bean seed production. The role of common bean seed producers is pertinent in improving the access of farmers for quality seed of common bean. Hence, further research on profitability and determinants of quality seed of common bean production is important in generating valuable information that is important in the measures towards enhancing production of improved common bean seed, increasing profitability of smallholder common bean seed producers and improving the access of farmers for quality seed of common bean.

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Appendix

Table A.1. Fitness Test Results for Different Functional Forms

Indices	Linear	Semi log	Exponential	Double log
Akaike's Information Criteria (AIC)	851.3515	850.6641	-110.8986	-127.4266
Bayesian Information Criteria (BIC)	882.8264	882.1391	-79.42366	-95.95161
F-Statistic	56.56	56.86	42.75	48.88
Prob(F-statistic)	0.000	0.000	0.0000	0.0000
R squared(R^2)	0.7452	0.7462	0.6872	0.7159
Number of significant variables	6	7	5	7

***= Significant at 1% level

Table A.2. The Summary of the Diagnostic Tests in Multiple Regression Model

Test statistics	Type of test employed	Statistical results
Normality	Shapiro-Wilk W test on residual	Prob>z =0.59556
	Skewness/Kurtosis tests on residual	Prob>chi2 =0.2964
Heteroskedasticity	Breusch-Pagan/Cook-Weisberg	Prob>chi2 =0.2103
Model Misspecification	Ramsey RESET test	Prob> F = 0.5123
Multicollinearity	Variance Inflation Factor (VIF)	Mean VIF = 1.32

Table A.3. VIF for Continuous Explanatory Variables in Logistic Regression

Variable	VIF	Tolerance level((TOL=1/VIF)
Distance to nearest market	1.08	0.926
Family size	1.05	0.955
Non-Farm Income	1.08	0.928
Farm size	1.08	0.932
Experience	1.03	0.969
Mean Value	1.064	0.942

Table A.4. Contingency Coefficients for Dummy Variables in Logistic Regression

	Gender	Collective marketing	Common bean type
Gender	1	0.065	0.065
Collective marketing	0.065	1	0.115
Common Bean type	0.065	1.115	1

Table A.5. The Link Test Result of Logit Model Specification

Profit	Coefficients	Standard Error	z values	P values
_hat	1.155	0.319	3.62	0.000***
_hatsq	-0.068	0.105	-0.65	0.514
_cons	0.006	0.298	0.02	0.985
Log-L = - 66.562 Pseudo R2 = 0.2457 LR chi2(2) = 43.36 Prob > chi2 = 0.0000 N= 172				

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Yenilikçi İnsan Kaynakları Yönetim Uygulamalarının Örgütsel Çeviklik Üzerindeki Etkisi: Savunma Sanayi İşletmelerinde Bir Araştırma[1]

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Özet

Günümüz iş dünyası kavram ve uygulamaları ve buna bağlı gelişen akademik çalışmalar önemli bir değişim sürecinden geçmektedir. Bu değişim sürecinde, insan kaynakları rekabet avantajı sağlayan en önemli faktör haline gelmiştir. Buna paralel olarak, örgütlerin hızlı değişim ve dönüşüm sürecine ayak uydurmaları ve cevap verebilmeleri çeviklik kavramını ön plana çıkarmıştır. Bu bilgiler ışığında bu araştırma, Savunma Sanayi'nde yenilikçi insan kaynakları yönetim uygulamalarının örgütsel çeviklik üzerindeki etkisini ortaya koymak amacı ile hazırlanmıştır. Araştırma, Türkiye Savunma Sanayi'nde faaliyet gösteren 10 büyük ölçekli işletmede, 498 beyaz yakalı çalışan ve yönetici üzerinde gerçekleştirilmiştir. Ölçüm için kullanılan anketlerin güvenilirlik ve geçerliliği analiz edilmiş, iddia hipotezini test etmek üzere regresyon analizi uygulanmıştır. Araştırma bulgularına göre; ülkemiz savunma sanayinde, yenilikçi insan kaynakları yönetim uygulamalarının örgüt çeviklik üzerinde anlamlı bir etkisi vardır. Araştırmanın hem yönetsel anlamda hem de bundan sonra yapılacak akademik çalışmalar için önemli bir ön adım niteliğinde olduğu ve sektöre farklı bir bakış açısı kazandıracağı düşünülmektedir.

Anahtar Kelimeler: *Yenilikçi İnsan Kaynakları Yönetimi, Örgütsel Çeviklik, Savunma Sanayi, İnsan Kaynakları Yönetimi, Çeviklik*

JEL Sınıflandırması: *M10, M12*

The Effect of Innovative Human Resources Management Practices on Organizational Agility: A Research on Defense Industry

Abstract

Today's business concepts, practices and academic studies have been going through a significant process of change. In this process of change, the human resources have become the most important factor that provides a competitive advantage. On the other hand, adapting and responding to the rapid change and transformation process has brought the concept of organizational agility to the fore. In the light of this, this research has been conducted in order to reveal the effect of innovative human resources management practices on organizational agility. The research was carried out on 498 white-collar staff and managers which work for 10 large-scale companies that operates in defense industry of Turkey. After analyzing the reliability and validity of the questionnaires, regression

[1] Bu makale, "Vizyoner Liderlik ve Yenilikçi İnsan Kaynakları Yönetim Uygulamalarının Örgütsel Çeviklik Üzerindeki Etkisi: Savunma Sanayi İşletmelerinde Bir Araştırma" başlıklı doktora tezinden üretilmiştir.

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analysis was applied to test the research hypothesis. According to the findings, in companies operating in the defense industry of Turkey, innovative human resources management practices have a significant effect on organizational agility. It can be said that the research is an important preliminary step for both administrative and future academic studies and will bring a different perspective to the sector.

Keywords: *Innovative Human Resources Management, Organizational Agility, Defense Industry, Human Resources Management, Agility*

JEL Classification: *M10, M12*

1. Giriş

Yönetim biliminde post-modern dönem olarak adlandırılan günümüzde, yaşanan hızlı değişim ve dönüşümler, işletme kavram ve uygulamalarını etkisi altına almıştır. Sanayi devriminin örgütsel ve yönetsel süreçlere bakış açısı ve yüklediği anlam ile içinden geçtiğimiz dönemin bu süreçlerle olan ilişkisi aynı değildir. İşletmeler; rekabet, verimlilik, etkinlik, yenilik, çeviklik, hız, esneklik gibi kendilerine hayatta kalma fırsatı veren uygulama ve kavramlara yönelmişlerdir.

Yenilik diğer bir ifade ile inovasyon veya yenileşim (Akalın, 2007), günümüz dünyasında birçok alanda kendini gösteren bir kavram hatta bir eylem olarak karşımıza çıkmaktadır. Özellikle iş dünyası için başarılı olmanın kilit faktörlerinden birisi (Soliman, 2011), hatta bazı akademisyenler tarafından (McGrath, 2001; Som, 2008) en önemlisi kabul edilen yenilik hakkında birçok araştırmacı farklı tanımlamalar yapmış, örgütlerde meydana gelen "yenilikleri" farklı şekillerde kategorize etmişlerdir. Son dönemde ortaya çıkan farklı yönetim sistemlerinde, yeniliği destekleyen çok çeşitli uygulamalar varlığını sürdürse de yeni bilginin temelinde insanın olması insan kaynakları yönetimini (İKY) diğer birçok uygulamanın önüne geçirmiş ve son dönemde çalışmalar bu doğrultuda yoğunlaşmıştır (Mumford, 2000, akt. Kılıç ve Bilginoğlu, 2010).

Benzer bir şekilde, örgütsel çeviklik, günümüzün rekabetçi ve hızla değişen ortamında giderek daha fazla işletme için önemli ve ilgili bir kavram olarak yerini almıştır. Örgütsel çevikliğin bu rekabet baskısıyla başa çıkmada anahtar bir kavram olduğuna dair artan farkındalığa rağmen, "çeviklik" terimi günümüzde çoğu işletme tarafından makul bir ciddiyetle ele alınmamaktadır. Oysa çevik bir örgüte giden yol, bir işletmenin işgücünden kullandığı teknolojilere, örgüt yapısı ve süreçlerinden örgüt kültürüne kadar tüm bölüm ve işlevlerini etkileyen bir gelişim sürecidir (Wendler, 2014).

Bu bilgiler ışığında bu araştırma, ülkemiz savunma sanayi sektöründe faaliyet gösteren firmalarda, yenilikçi insan kaynakları yönetim uygulamalarının örgüt çeviklik üzerindeki etkisini ortaya koymak amacı ile hazırlanmıştır. Araştırma, toplam 23 büyük ölçekli işletme içerisinde en çok istihdam ve yıllık ciroya sahip 10 işletmede çalışan 498 beyaz yakalı ve yönetici üzerinde anket tekniği kullanılarak gerçekleştirilmiştir. Elde edilen sonuçların bu evren çerçevesinde yorumlanarak benzer araştırmaların tümünde yakın sonuçlar elde edileceği varsayılmıştır. Araştırma, maliyet, zaman gibi unsurlar açısından ve sadece savunma sanayinde faaliyet gösteren 10 büyük ölçekli firma ile sınırlandırılmıştır.

Ayrıca, araştırmaya konu olan firma isimleri ve istihdam rakamları stratejik öneme sahip olmaları sebebi ile Kişisel Verileri Koruma Kanunu (KVKK) kapsamında gizli tutulmuştur.

Çalışmanın ilk iki bölümü, yenilikçi İKY uygulamaları ve örgütsel çeviklik konularında literatür taraması sonuçlarını içermektedir. Üçüncü bölüm; araştırmanın amacı, soruları, hipotezi, veri toplama araçları ve örneklem hakkında bilgi vermektedir. Çalışmanın dördüncü bölümünde, demografik değişkenlere ait analiz sonuçları, faktör analizi ve regresyon analizlerine ait sonuçlar ve değerlendirme, son bölüm de ise analiz sonuçları hakkında tartışma ve araştırmacının önerileri yer almaktadır.

2. Yenilikçi İnsan Kaynakları Yönetim Uygulamaları

İnsan kaynakları (İK) uygulamalarında geleneksel yöntemlerin çağdaş iş ortamının dinamizmini yakalaması ve insanı bir rekabet aracı olarak elde tutacak argümanları geliştirmesi oldukça zordur (Sharma ve Khera, 2019). Dolayısı ile, iş dünyasında rekabetin her geçen gün daha da yoğunlaştığı ve bu nedenle İK'nın bir örgüte rekabet avantajı sağlayan önemli bir faktör olduğu göz önünde bulundurulduğunda, insan kaynakları yönetiminde yenilikçi yöntemler kaçınılmaz hâle gelmiştir (Aslam vd., 2013). Yenilikçi İKY uygulamaları, çalışanların değerini, yaratıcı personel uygulamalarını, eğitim ve gelişim programlarını, şeffaf bir performans değerleme ve yönetim politikasını ve örgütün değerlerini yansıtan ücretlendirme politikalarını vurgulayan bir kültür anlamına gelmektedir (Hinkin ve Tracey, 2010).

2.1. Kavramsal Çerçeve ve Tanım

Kavram literatürde zaman zaman farklı şekillerde kullanılsa da genellikle, yenilikçi insan kaynakları yönetim uygulamaları, insan kaynakları yönetiminde (İKY) yenilik, ilerici İKY uygulamaları, etkili İKY, yüksek performanslı İKY veya iş sistemi, İKY uygulamalarında kalite şeklinde yer almaktadır (Kossek, 1987; Huselid, 1995; Agarwala, 2003; Laursen ve Foss, 2003; Wolfe, Wright ve Smart, 2006; Abdullah, 2009; Kehoe ve Wright, 2013; Zhang, Fan ve Zhu, 2014; Muduli, 2015). Yönetim literatürü, firmaların yenilikçi davranışında belirleyici faktörler olarak stratejik yönetimi, örgüt tasarımını, yönetim tarzını ve insan kaynakları yönetimini vurgulamaktadır. Ancak, insan unsurunun tüm inovasyon süreçlerinin merkezinde olmasından dolayı, insan faktörü ve özellikle İKY, günümüzde başarılı inovasyonun temel unsurları olarak kabul edilmektedir (Jiménez ve Valle, 2005).

Dubey ve Gupta (2019:76), yenilikçi İKY'yi, "rekabeti göz önünde bulundurarak işletmeler tarafından benimsenen yeni ve geliştirilmiş tüm uygulama ve faaliyetler" olarak tanımlamışlardır. Diğer bir tanıma göre, İKY'de yenilik, üyeler tarafından yeni olarak algılanan, firmanın performansını artırmak amacıyla çalışan tutum ve davranışlarını etkilemek için tasarlanmış herhangi bir program, politika veya uygulamadır (Joy, 2016; Kossek, 1987; Som, 2006).

Geleneksel İKY uygulamaları genel olarak dört işlevi içermektedir: işe alım ve seçim, değerlendirme, eğitim ve geliştirme, ücretlendirme ve sosyal haklar. Buna ek olarak örgüt tasarımı ve iletişimin İKY'nin konusu olduğu hususunda genel bir

kanı da söz konusudur. Yenilikçi İKY, bu işlevlerinden herhangi birisinde veya hepsinde gerçekleşen yenilik olarak tanımlanmaktadır (Wolfe, 1995).

Yenilikçi İKY uygulamaları konusunda literatürde üç farklı araştırma süreci göze çarpmaktadır: (1) İKY'de yenilikçi uygulamalar, (2) Yeniliğe bir yanıt olarak İKY ve (3) İKY'nin örgütlerin yenilikçiliği ile ne denli bağlantılı olduğunu gösteren araştırmalar (Koster, 2019). Dolayısı ile, her üç bağlamın hem akademide hem de uygulamada kafa karışıklığına yol açabileceği göz önüne alındığında, araştırmaların hangi kavramsallaştırma ile yola çıkacağını vurgulaması oldukça önemlidir (Benda ve Koster, 2020).

2.2. Örgütlerde Yenilikçi İnsan Kaynakları Uygulamaları

Diğer örgütlerden benimseme veya uyarlama yoluyla bile olsa, yenilikçi insan kaynakları yönetimi (İKY), organizasyonun mevcut veya yerleşik insan kaynakları (İK) uygulamalarında gerçekleştirilen yenilikleri ifade etmektedir. Rekabetin arttığı bir çağda, etkili İK yönetiminin artık sadece standart bir uygulama seti ile yetinmemesi gerektiği özellikle vurgulanmaktadır. Rekabette kalabilmek için sürekli olarak yeni ve iyileştirilmiş İK uygulamalarının geliştirilmesi ve uygulanmasına ihtiyaç vardır (Agarwala, 2003).

Bazı akademisyenler, yenilikçi uygulamalara sistem perspektifinden bakarak bir uygulama seti oluşturmuş (Agarwala, 2003; Kloutsiniotis ve Mihail, 2017; Macduffie, 1995; Sharma ve Khera, 2019; Zheng vd., 2009), dolayısı ile yenilikçi İK uygulamalarını daha kapsamlı tanımlamışlardır. Ancak diğer tarafta, İK uygulamalarının sistem yaklaşımı açısından bir set halinde incelenmesi, bireylerin neden belirli bir şekilde davrandığına ilişkin tespiti zorlaştıracağından uygulamaları bağımsız düzeyde incelemişlerdir (Bos-Nehles ve Veenendaal, 2017; Liu-Chi, 1998; Muduli, 2015; Xiu vd., 2017).

Agarwala (2003), örgütlerde 14 yenilikçi insan kaynakları uygulaması belirlemiş, farkındalık, yürütme ve sonuçların tatmini olarak üç boyut altında incelemiştir. Bunlar; personel edinme stratejileri, emeklilik stratejileri, tazminat ve teşvikler, sosyal yardım ve hizmetler, ödül ve takdir, teknik eğitim, yönetim geliştirme, kariyer planlaması ve geliştirme uygulamaları, performans değerlendirme, potansiyel geliştirme, başarı planlaması, çalışan ilişkileri, personel çıkış ve ayrılma yönetimi, sosyal sorumluluk çalışmalarıdır.

Sharma ve Khera (2019), yenilikçi uygulamaların örgütsel bağlılığı etkileyen önemli bir unsur olduğunu vurgulamışlardır. Yenilikçi İK uygulamaları içerisinde, eğlence etkinlikleri ve motivasyon programları, zorunlu izinler, çalışanlar ve aile sağlığı için yatırım planları, işyeri esnekliği, yönetim geliştirmeyi bireysel ihtiyaçlarla ilişkilendirme, davranış geliştirme eğitim programları ve yedekleme planlamasını saymışlardır.

Zheng vd. (2009) göre, büyüme odaklı şirketler arasında, performansa dayalı ücret, sosyal haklar, eğitim ve geliştirme, performans değerlendirme, karar alma sürecine çalışanların katılımının teşvik edilmesi, sendika ile ilişkiler ve stratejik işe alım ve seçimi yenilikçi İK uygulamaları olarak benimsenmiştir.

Bunlara ek olarak; yetenek yönetimi (Ülger, 2017), temel beceri eğitimi, iş başında deneyim ve eğitim, koçluk, mentörlük ve yönetim gelişimi (Huselid, 1995), ekip çalışması ve bilgi paylaşımı, iş rotasyonu (Macky ve Boxall, 2007), problem çözme (Osterman, 1994; Macduffie, 1995), kariyer gelişimi (Sezer ve Ak, 2017), geri bildirim, öneri sistemleri, esnek iş atama programları (Oladapo ve Onyeaso, 2013; Pelenk, 2016; Zhou vd., 2013) gibi yenilikçi uygulamalardan bahsetmek mümkündür.

Pelenk (2016), Agarwala'nın (2003) çalışmasından yola çıkarak, işletme kültürünü yenilikçi zemine taşıyacak ve bu çalışmanın veri oluşturmada temel aldığı İKY uygulamalarını belirlemiş, bu uygulamaları; farkındalık, yürütme ve sonuçların tatmini olmak üzere 3 boyut altında incelemiştir. Farkındalık, uygulamaların işletmede tanıtımı ve çalışanların beklentileri ile görevler arasında bir karşılaştırma sürecidir. Yürütme ise, uygulama sürecidir. Sonuçların tatmini, uygulamalar neticesinde elde edilen sonuçlardan yönetim ve çalışanların tatmin olmasını ifade etmektedir. Tablo 1 bu uygulamalar hakkında detayları göstermektedir.

Tablo 1. Yenilikçi İnsan Kaynakları Uygulamaları

Eğitim	Çalışanlara hızlı bilgi aktarımı, farklı bakış açıları ve farkındalık
Takım Çalışması	Amaca odaklanma ve katılımcılık
Öneri Sistemleri	Çok yönlü iletişim, değer yaratma ve öngörü yeteneği
Sosyal Faaliyetler	Sosyalleşme ve çalışanlara "birey" olarak değer verme
Performans Bazlı Ücretlendirme	Motivasyon ve kariyer planlaması
Yaratıcılık	Yeteneklerin çekilmesi ve işletmede tutulması, yenilik kültürünü benimseme
Mentorluk-Koçluk	Sürekli öğrenme, yenilikçilik aktörleri ve bilgi transferi
İş Rotasyonu	Deneyim, yaratıcılık ve farkındalık
Güçlendirme	Mesleki gelişim ve sürekli inisiyatif kullanarak hareket etmek
Sosyal Sorumluluk	Sosyal duyarlılık/topluma saygı

Kaynak: Pelenk, S. E. (2016). Yenilikçi insan kaynakları yönetimi uygulamalarının yenilik odaklı bir kültür oluşturmadaki rolü bağlamında iş tatmini ve iş performansı üzerindeki etkileri. Sakarya Üniversitesi Doktora tezi. s.138.

3. Örgütsel Çeviklik

Örgütsel çeviklik, günümüzün rekabetçi ve hızla değişen ortamında giderek daha fazla işletme için önemli ve ilgili bir kavram olarak yerini almıştır (Wendler, 2014). Dyer ve Shafer (1998), öngörülemez ölçüde değişimin yaşandığı dış dünyada, geleneksel yönetim faaliyetlerinin yetersiz kaldığını ve bir paradigma değişiminin yaşanması gerektiğini vurgulamışlar, bu paradigma değişiminin ise örgütsel çeviklik olduğunu ileri sürmüşlerdir.

3.1. Kavramsal Çerçeve ve Tanım

İşletme Sözlüğünde örgütsel çeviklik; bir firmanın, pazarda meydana gelen değişikliklere yanıt olarak hızla değişme veya uyum sağlama yeteneği olarak yer almaktadır (Anca-Ioana, 2019). Kavram literatürde; çevik üretim, örgütsel çeviklik, çevik örgüt, işletme çevikliği, iş çevikliği ve örgüt atikliği başlıkları altında incelenmiştir (Hormozi, 2001; Anca-Ioana, 2019; Budak vd., 2011; Sherehiy vd., 2007; Wendler, 2013). Bunun yanı sıra, örgütsel çeviklik konusu dâhilinde ancak bir alt başlık olarak incelenen kavramlarda bulunmaktadır. İşgücü çevikliği, çevik yönetim, pazar çevikliği, zihinsel çeviklik bunlardan bazılarıdır (Breu vd., 2001; Dyer ve Shafer, 2003; Crocitto ve Youssef, 2003; Cegarra-Navarro ve Martelo-Landroguez, 2020).

Örgütsel çeviklik, "çevik üretim" adı altında ilk olarak, 1991 yılında ABD'deki Lehigh Üniversitesi Iaccoca Enstitüsü'nde, bir grup bilim insanı tarafından popüler hale getirilmiş ve akademisyenler arasında geçerlilik kazanmaya başlamıştır (Yusuf vd., 1999). Sharifi ve Zhang (1999:10), örgütsel çevikliği, beklenmedik değişikliklerle başa çıkma, tehditlerinden kurtulma ve fırsatlardan yararlanma yeteneği olarak tanımlamışlardır. Günasekaran'a (1999:87) göre çevik üretim, müşteri tanımlı ürün ve hizmetlerin yönlendirdiği, değişen pazarlara hızlı ve etkili bir şekilde tepki vererek, sürekli ve öngörülemeyen bir değişimin rekabetçi ortamında hayatta kalma ve gelişme yeteneğidir. Örgütsel çevikliğin entelektüel çeviklik kazanımı ile ortaya çıkacağını vurgulayan Cegarra-Navarro ve Martelo-Landroguez (2020:461) kavramı şu şekilde tanımlamışlardır: "Bireylerin bilgi ve becerileri öğrenme yoluyla pratik bir bağlama nasıl entegre edebileceklerini içermektedir. Çalışanların sahip olduğu entelektüel çeviklik, organizasyon tarafından yakalanıp koordine edildiğinde, örgütsel çevikliğe dönüşür." Seo ve La Paz (2008) örgütsel çevikliği, bir örgütün iç ve dış ortamdaki değişimleri algılamasına, zamanında ve en uygun maliyetle, verimli ve etkili bir şekilde yanıt vermesine ve örgütün yetkinliklerini geliştirmek için tecrübelerinden öğrenmesine olanak tanıyan bir dizi süreç olarak tanımlamışlardır.

Wendler (2013), 28 çeviklik model ve kuram üzerinde gerçekleştirdiği karşılaştırmalı araştırma sonucunda, literatürde yer alan çeviklik çalışmalarının; çevik üretim, çevik yazılım geliştirme, çevik örgüt ve çevik işgücü olarak 4 temel alanda gerçekleştiğini vurgulamaktadır. Ancak araştırmacı, çevikliğin ne anlama geldiğine ve nelerden oluştuğuna dair ortak bir anlayış eksikliğine işaret etmiş, geliştirilen modellerin, içerik ve yapı açısından oldukça heterojen bir yapıda olduğuna işaret etmiştir.

3.2. Örgütsel Çeviklik Modelleri

Literatürde yer alan çalışmalar incelendiğinde, 90'lı yıllar itibari ile süre gelen birçok örgütsel çeviklik model ve kuramının geliştirildiğini söylemek mümkündür. Meilich (1997), "kaos ve düzen" metaforu üzerinden çeviklik kavramını açıklamaya çalışmış, çevik örgütlerin; bir yandan olabildiğince fazla inisiyatif alıp inovasyon ortaya çıkarırken (kaos), diğer yandan genel koordinasyon ve işbirliği için de mekanizmalar (düzen) oluşturduğunu savunmuştur.

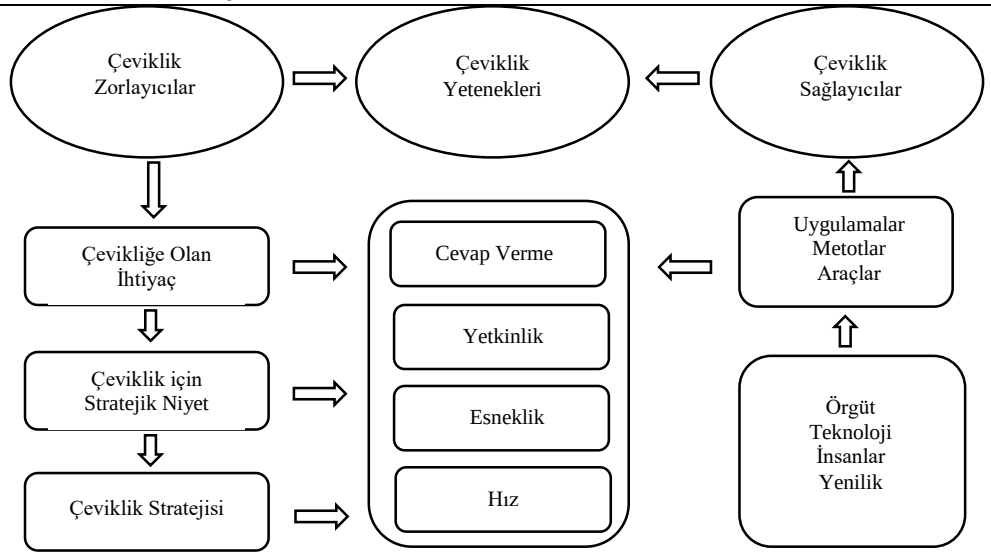
Meade ve Sarkis (1999), sistem perspektifinden konuya yaklaşmış ve 4 boyutlu bir çeviklik modeli ortaya koymuşlardır. Bu 4 boyutu; rekabet gücünü geliştirmek için işbirliği, değişim ve belirsizlikle baş etmek, insanlar ve bilginin gücünden yararlanmak, müşteri portföyü zenginleştirme olarak belirlemişlerdir.

Breu vd. (2001) ise, "işgücü çevikliği" önermesi yapmışlar, işçilerden bağımsız bir şekilde bir örgütün gerçek manada çevik olamayacağı, ancak çalışanların sayesinde çevikliğin elde edilebileceğini vurgulamışlardır. Örgütlerde, işgücü çevikliğinin oluşmasına etki eden temel faktörler üzerinden bir model önermesi yapmışlardır. Aynı şekilde; Brown ve Agnew (1982), Băjenaru vd. (2014), Seo ve La Paz (2008), Wendler (2014) çalışmalarında işgücünün önemine vurgu yapmışlar, çevik örgütlerde; yaratıcı ve yenilikçi, sahada gerçek bilgi sunan, zorluklarla baş edebilen, takım çalışmasına yatkın ve sorumluluk duygusu yüksek insan gücünün önemini ortaya koymuşlardır.

Crocitto ve Youssef'un (2003) çevik yönetim modeli konuyu; müşteri ve tedarikçiler, lider, örgüt kültürü, ödül sistemleri ve örgüt üyeleri bağlamında incelemektedir. Lider, bir çeviklik vizyonu ve misyonu yaratma yeteneğine sahip, örgütte öğrenmeyi teşvik ettiği gibi değişimin kabulü için gayret göstermektedir. Gelişen bilgi teknolojilerinin adaptasyonunda yine lidere önemli görevler düşmektedir. Örgüt kültürü; yeniliği, bilginin yayılmasını ve takım çalışmasını destekler nitelikte olmalıdır. Çalışanlar, işletme ortakları olarak görülmeli ve müşteri ile olan ilişkileri geliştirilmelidir. Özellikle, ürün ortaya koyan teknik ekiplerin müşteri ile olan ilişkileri bilgi yayılımı açısından önemli olduğu kadar iletişim ağını da genişletmektedir.

Sharifi ve Zhang (2000), örgütlerin, dış ortamda gerçekleşen değişiklikleri öngörme, algılama ve anlama konusunda yeteneklerini geliştirmenin önemine işaret etmişlerdir. Bu amaçla, örgütlerin çevik üretim arayışlarında stratejik kararlar almalarına yardımcı olacak bir metodolojinin oluşturulması için üç ana bölümden oluşan kavramsal bir çeviklik modeli ortaya koymuşlardır.

Birincisi, hayatta kalmak veya rekabet avantajı elde etme amacı ile örgütü çevikliğe zorlayan etkenlerdir (çeviklik zorlayıcıları). Bu etkenler beş ana kategoriye ayrılmaktadır: pazarda yaşanan değişimler, rekabet, müşteriler, teknoloji ve sosyal faktörler. İkincisi, değişime yanıt vermek için gerekli gücü sağlayacak olan örgütün temel yetenekleri yani çeviklik yetenekleridir. Bunlar; cevap verme, yetkinlik, esneklik ve hızdır (Sharifi ve Zhang, 1999). Buna ek olarak, Žitkienė ve Deksnys (2018), çeviklik yeteneklerini, algılama ve cevap verme yetenekleri olarak 2 temel sınıf altında incelemişlerdir. Algılama yetenekleri; farkındalık ve yetkinlikdir. Cevap verme yetenekleri ise; yeniden yapılandırma, öğrenme, koordinasyon ve işbirliği yetenekleridir Modelin üçüncü ayağı ise, yeteneklerin elde edilmesini sağlayacak olan araçlar, kısaca "çeviklik sağlayıcılarıdır." Bunlar; örgüt, teknoloji, insanlar ve yeniliktir. Şekil 1, modelin tüm aşamaları hakkında detaylı bilgi vermektedir (Sharifi ve Zhang, 1999).



Şekil 1. Sharifi ve Zhang'ın kavramsal çeviklik modeli

Kaynak: Sharifi, H., ve Zhang, Z. (1999). A methodology for achieving agility in manufacturing organisations: an introduction. International Journal of Production Economics. s.11.

4. Yöntem

4.1. Araştırmanın Amacı, Soruları ve Hipotezi

Türkiye'de son dönemde hızlı bir büyüme ivmesi yakalayan savunma sanayi sektöründe gerçekleştirilen bu araştırmanın amacı, sektör içinde faaliyet gösteren işletmelerde yenilikçi insan kaynakları yönetim (İKY) uygulamalarının örgütsel çeviklik üzerindeki etkisini ortaya koymaktır. Çalışmanın bağımsız değişkeni yenilikçi İKY ve bağımlı değişkeni ise örgütsel çeviklik olarak belirlenmiştir.

Savunma sanayinde faaliyet gösteren 10 büyük ölçekli firma üzerinde gerçekleştirilen bu araştırmada aşağıdaki sorulara cevap aranmaya çalışılmıştır:

- Ülkemizde yer alan savunma sanayi firmalarında, yenilikçi İKY uygulamalarının örgütlerin çevikliği üzerinde etkisi var mıdır?
- Ülkemizde yer alan savunma sanayi firmalarında, yenilikçi İKY uygulamalarının örgütlerin çevikliği üzerinde etkisi var ise hangi yöndedir?

Bu sorular doğrultusunda, çalışmada doğrulanmaya çalışılacak olan iddia hipotezi aşağıdadır. Ana iddia hipotezi doğrultusunda, yenilikçi İKY uygulamalarının alt boyutlarının örgütsel çeviklik alt boyutları üzerindeki etkisi incelenecektir.

H_1: Yenilikçi insan kaynakları yönetim uygulamalarının örgütsel çeviklik üzerinde anlamlı bir etkisi vardır.

4.2. Veri Toplama Araçları

Yenilikçi insan kaynakları yönetim (İKY) uygulamaları verileri için Agarwala (2003) tarafından geliştirilen ve Pelenk (2016) tarafından Türkçeye çevirisi yapılan "Yenilikçi İKY Uygulamaları Ölçeği" kullanılmıştır. Ölçek; farkındalık boyutuna

ait 10 soru, yürütme boyutuna ait 10 soru, sonuçların tatmini boyutuna ait 10 soru olmak üzere toplam 30 sorudan oluşmaktadır. Ölçeğin iç tutarlılığını belirlemek için, Pelenk (2016) tarafından Spearman-Brown, Split Half ve Cronbach Alfa güvenirlik testleri uygulanmıştır. Sonuçlara göre, spearman-brown ve Split-half güvenilirlik katsayıları güvenilir ölçümler yapılabileceğini göstermiştir.

Örgütsel Çeviklik verileri için Sharifi ve Zhang (1999) tarafından geliştirilen ve Akkaya ve Tabak'ın (2018) çevirisini yaptığı "Örgütsel Çeviklik Ölçeği" kullanılmıştır. Ölçek; yetkinlik boyutuna ait 8 soru, esneklik boyutuna ait 3 soru, cevap verme boyutuna ait 3 soru, hız boyutuna ait 3 soru olmak üzere toplam 17 sorudan oluşmaktadır. Akkaya ve Tabak (2018) tarafından ölçeğe güvenilirlik ve geçerlilik testleri uygulamış, ölçeğin kabul edilebilir değerlerde güvenilir ve geçerli bir ölçme aracı olduğu tespit edilmiştir.

4.3. Evren ve Örneklem

Araştırma, Türkiye genelinde savunma sanayi sektöründe faaliyet gösteren 23 büyük ölçekli firmadan istihdam ve ciro rakamları en yüksek 10 firma üzerinde gerçekleştirilmiştir. Savunma ve Havacılık Sanayi İmalatçılar Derneği'nin yayınladığı son rapora göre (SASAD Performans Raporu, 2018), sektörde büyük ölçekli işletme sayısı 23'tür. 23 firmanın istihdam oranı toplam istihdamın yüzde 70'i, cirosu ise toplam cironun yüzde 88'idir. 23 büyük ölçekli firmalardaki 47.054 olan istihdam rakamı (SASAD, 2018) göz önüne alındığında 10 firmada ortalama 20.000 kişi çalıştığı varsayılmıştır. Bu rakamda çalışana ulaşmanın zaman ve bütçe kısıtları açısından mümkün olmadığı düşünülerek, örneklem çerçevesi ana kütle içinden sistematik tesadüfi örnekleme yöntemi ile belirlenmiştir.

Literatürde, örneklem sayısı seçiminde farklı örneklem büyüklüklerinin faktör analizine uygun olacağını ortaya koyan çalışmalar mevcuttur (Cattell, 1978; Comrey ve Lee, 1992; Everitt, 1975; Kline, 1994; Nunnally, 1978). Gorsuch (1983), değişken başına en az beş denek önermesi yapmış, bu oranın araştırma sağlığı açısından önemli olduğunun altını çizmiştir.

Bu araştırmada Gorsuch'un (1983) yaklaşımı dikkate alınmıştır. Araştırmada kullanılan değişken sayısı 53'tür. Dolayısı ile, her değişken başına 5 denek ile yapılan basit çarpma işlemi sonucunda toplam 265 deneğin yeterli olacağı tespit edilmiştir. Ancak Gorsuch'un (1983) önermesi en az 5 denek şeklindedir. Bu sebeple, anketlerin yetersiz kalmaması ve temsiliyet oranını daha yüksek tutabilmek adına 10 firmada çalışan toplam 498 işgören üzerinde anket çalışması gerçekleştirilmiştir.

23 savunma sanayi firması toplam istihdam ve ciro rakamlarının, ülke geneli savunma sanayi toplam ciro ve istihdam rakamları içerisindeki temsiliyeti göz önüne alındığında, çalışmanın sonucu ülke genelinde faaliyet gösteren savunma sanayi firmalarına genellenebilecektir.

5. Bulgular ve Tartışma

Çalışmada elde edilen bulguların istatistiksel analizleri SPSS 22.0 istatistik paket programlarında gerçekleştirilmiştir. Katılımcılara ilişkin sosyodemografik

özellikler betimsel olarak incelenmiştir. 498 kişilik örneklem çapı ile yapılan çalışmada katılımcıların anketteki ölçek sorularına verdikleri cevaplara ilişkin geçerlilik ve güvenirlik analizi yapılmış, ölçeklerin geçerliliği ve güvenirliği saptandıktan sonra basit doğrusal regresyon analizi ile araştırma hipotezi test edilmiştir. Sonuçlar %95, %99 güven aralığında ve $p<0,05$, $p<0,01$ anlamlılık düzeyinde değerlendirilmiştir. Araştırmanın gerçekleştirildiği firmaların isimleri, stratejik öneme sahip olmaları sebebi ile KVKK kapsamında gizli tutulmuştur.

5.1. Demografik Değişkenlere İlişkin Bulgular

Katılımcıların çalıştığı firmalar; %11,2 A Firması, %10,6 B Firması, %10,4 C Firması, %9,0 D Firması, %11,0 E Firması, %9 F Firması, %9,8 G Firması, %10,0 J Firması, %8,8 K Firması, %9,8 L Firmasıdır. 10 büyük ölçekli firmadan eşit derecede katılımcı sağlanmaya çalışılmıştır. Cinsiyet açısından katılımcıların; %64,1'i erkek ve %35,9'u kadınlardan oluşmaktadır. Yaş durumlarında ise; %16,3 18-24 yaş arası, %58,4 25-34 yaş arası, %20,5 35-44 yaş arası, %4,0 45-54 yaş arası, %0,8 55 ve üzeri gibi bir dağılım ortaya çıkmıştır. Öğrenim durumu; %5,0 doktora, %53,4 lisans, %4,0 ön lisans, %37,6 yüksek lisans şeklindedir. Örgüt içi pozisyonlarda; %18,9 takım lideri, %9,8 kıdemli uzman, %13,5 uzman, %45,6 mühendis, %3,2 mühendis adayı, %4,4 stajyer, %2,8 tekniker, %1,8 uzman yardımcısı şeklinde bir dağılım söz konusudur. Son olarak, katılımcıların kurumdaki hizmet süreleri; %33,5 0-1 yıl arası, %41 2-5 yıl arası, %15,7 6-10 yıl arası, %5,4 11-15 yıl arası, %4,4 16 yıl ve üzeri olarak belirlenmiştir. Tablo 2, katılımcılara ait sosyodemografik özelliklere ilişkin frekans analizi sonuçları ve betimsel istatistikleri göstermektedir.

Tablo 2. Sosyodemografik Özelliklere İlişkin Frekans Analizi

Firma	Frekans	Yüzde (%)	Öğrenim Durumunuz	Frekans	Yüzde (%)
FİRMA A	56	11,2	Doktora	25	5,0
FİRMA B	53	10,6	Lisans	266	53,4
FİRMA C	52	10,4	Ön Lisans	20	4,0
FİRMA D	45	9,0	Yüksek Lisans	187	37,6
FİRMA E	55	11,0	Toplam	498	100,0
FİRMA F	45	9,0	Pozisyon	Frekans	Yüzde (%)
FİRMA G	49	9,8	Kıdemli Uzman	49	9,8
FİRMA J	50	10,0	Mühendis	227	45,6
FİRMA K	44	8,8	Mühendis Adayı	16	3,2
FİRMA L	49	9,8	Stajyer	22	4,4
Toplam	498	100,0	Takım Lideri	94	18,9
Cinsiyet	Frekans	Yüzde (%)	Tekniker	14	2,8
Erkek	319	64,1	Uzman	67	13,5
Kadın	179	35,9	Uzman Yardımcı	9	1,8
Toplam	498	100,0	Toplam	498	100,0
Yaşınız	Frekans	Yüzde (%)	Kurumdaki Hizmet Süreniz	Frekans	Yüzde (%)
18-24	81	16,3	0-1 Yıl	167	33,5
25-34	291	58,4	11-15 Yıl	27	5,4
35-44	102	20,5	16 Yıl ve üze	22	4,4
45-54	20	4,0	2-5 Yıl	204	41,0
55 ve üst	4	0,8	6-10 Yıl	78	15,7
Toplam	498	100,0	Toplam	498	100,0

Yapılan araştırmada kullanılan ölçeklere verilmesi istenilen cevaplar "1- Kesinlikle Katılmıyorum, 2- Katılmıyorum, 3- Kararsızım, 4- Katılıyorum, 5- Kesinlikle Katılıyorum" şeklinde ifade edilmiştir. Bu ifadeler doğrultusunda ortalama algı düzeylerinin 3'ün üzerinde yer alması, algının yüksek düzeyde olduğunu göstermektedir. 3'ün altında olması ise algının düşük düzeyde olduğunu ifade etmektedir.

Tablo 3'te yer alan değerler, sorulara ilişkin ortalama algı düzeyleri hakkında bilgi vermektedir. Bu durumda, katılımcılar içinde yüksek algıya sahip ölçek Örgütsel Çeviklik (3,94±0,71), daha sonra Yenilikçi İnsan Kaynakları Yönetim (İKY) Uygulamaları (3,38±0,89) olarak belirlenmiştir. Örgütsel Çeviklik ölçeği alt boyutları incelendiğinde ise sırasıyla; Esneklik (4,16±0,82), cevap verme (3,91±0,89), yetkinlik (3,89±0,78) ve Hız (3,88 ± 0,86) olarak belirlenmiştir. Yenilikçi İKY ölçeği alt boyutları sırasıyla; yürütme (3,44±0,88) ve farkındalık (3,44±0,92) alt boyutlarının eşit ortalamaya sahip olduğu söylenebilir iken, sonuçların tatmini (3,27±,95) alt boyutunun daha düşük algı düzeyinde ölçüldüğü görülmüştür.

Tablo 3. Katılımcıların Sorulara İlişkin Ortalama Algı Düzeyleri

Maddeler	N	Medyan	Ortalama	Standart sapma	Çarpıklık	Basıklık	Minimum	Maximum
İletişim	498	4,000	3,8072	0,889	-0,971	0,441	1,000	5,000
Güven	498	4,000	3,8986	0,900	-1,095	1,186	1,000	5,000
Risk	498	3,500	3,3208	0,798	-0,274	-0,048	1,000	5,000
Odak	498	4,000	3,8830	0,797	-1,018	1,071	1,000	5,000
Saygı	498	4,000	3,8648	0,891	-1,126	1,201	1,000	5,000
Örgütsel Çeviklik Ölçeği	498	4,000	3,9416	0,719	-0,542	0,052	1,583	5,000
Yürütme	498	3,600	3,4426	0,880	-0,567	0,017	1,000	5,000
Farkındalık	498	3,600	3,4422	0,924	-0,578	-0,069	1,000	5,000
Sonuçların Tatmini	498	3,400	3,2737	0,953	-0,440	-0,307	1,000	5,000
Yenilikçi İKY Ölçeği	498	3,500	3,3861	0,897	-0,536	-0,096	1,000	5,000

5.2. Faktör Analizi

Araştırmada, Barlett ve KMO testleri kullanılarak faktör analizi yapılmıştır. Analizde "Principal Axing Factoring" tahmin olarak kullanılmış, değişkenler arasındaki korelasyon yüksek seviyede çıktığı için "Promax" döndürme yöntemi kullanılarak uygulama yoluna gidilmiştir. Ölçeklerin ne derece güvenli olduğunu tespit etmek için ise Cronbach Alfa Katsayısı üzerinden güvenilirlik analizleri yapılmıştır.

5.2.1. Yenilikçi İnsan Kaynakları Yönetim Uygulamaları Ölçeği Güvenirlik Analizi

Yenilikçi İKY uygulamaları altında; farkındalık, yürütme ve sonuçların tatmini boyutlarına ait sorular, bir faktörü oluşturmak yerine, bir toplamı, yani toplam puan skorunu ifade ettiği için cronbach's alfa değerini ölçümlemek üzere güvenilirlik testi uygulanmıştır (Pelenk, 2016). Tablo 4'te yer alan Yenilikçi İKY ölçeği güvenirlik analizi sonuçlarına göre, tüm ölçeğin iç tutarlılık katsayısı cronbach's alfa değeri 0.978 olarak elde edilmiş olup bu değerin yüksek derecede güvenilir olduğu söylenebilmektedir.

Tablo 4. Yenilikçi İKY Ölçeği Güvenirlik Analizi

	Cronbach's Alpha	Madde sayısı
Yürütme	0,926	10
Farkındalık	0,942	10
Sonuçların Tatmini	0,946	10
Yenilikçi İKY Ölçeği	0,978	30

Yürütme, farkındalık ve sonuçların tatmini alt boyutlarının güvenirlik düzeyleri 0,926-0,942 arasında olduğu incelenmiş, alt boyutların güvenilir düzeyde olduğu sonucuna varılmıştır.

5.2.2. Örgütsel Çeviklik Ölçeği Faktör Analizi

Örgütsel Çeviklik ölçeği 17 farklı ifadeden oluşmaktadır. İfadelere ilişkin boyutlar üzerinden 2 kez faktör analizi yapılmıştır. İlk faktör analizi sonucunda faktör ağırlığı 0,30'un altında olan Yetkinlik boyutundan; "İşletmemiz çağın gereklerine uygun miktarda ve yeterli teknolojiye sahiptir", "İşletmemiz hedefine ulaşmak için tüm süreçlerde en az girdi ile en fazla çıktıyı elde etmeyi amaçlar" ve "İşletmemiz yüksek düzeyde ürün tanıtımı yapar", Esneklik boyutundan; "İşletmemiz insan kaynakları politikaları kapsamında esnekliğe sahiptir", Cevap verme boyutundan; "İşletmemiz müşterinin ihtiyaçlarındaki ve tercihlerindeki değişiklere hızla cevap verme yeteneğine sahiptir" ifadeleri araştırmadan çıkartılmıştır.

Tablo 5. Örgütsel Çeviklik Ölçeği Faktör Analizi

Maddeler	Alt Boyutlar				Özdeğerler	Varyans Açıklama Oranları
	Yetkinlik	Hız	Esneklik	Cevap Verme		
İşletmemiz uzun vadeli hedeflerini gerçekleştirecek stratejik vizyona sahiptir	0,526				7,7007	%55,994
İşletmemiz ürünleri ve bu ürüne ilişkin müşteriye sunduğu hizmet kalitesi yüksektir	0,438					
İşletmemiz konusunda uzman ve yetkilendirilmiş insan kaynağına sahiptir	0,638					

Maddeler	Alt Boyutlar				Özdeğerler	Varyans Açıklama Oranları
	Yetkinlik	Hız	Esneklik	Cevap Verme		
İşletmemizde tüm iş süreçleri basit, açık ve net tanımlamıştır	0,714					
İşletmemiz işletme içi ve işletme dışında iş birliği ortamı sağlamaya ve geliştirmeye önem verir	0,664					
İşletmemiz farklı ürün modelleri üretme esnekliğine sahiptir			0,847		1,053	%6,830
İşletmemiz farklı miktarda ürün ve hizmet üretme esnekliğine sahiptir			0,842			
İşletmemiz çevresel değişim kapsamında değişimin yönünü hisseder, algılar ve bu değişimlere hazırlıklı olur				0,545	0,934	%5,888
İşletmemizin yenilikler, çevre ve teknoloji kaynaklı değişikliklerin hızlı ve zamanında üstesinde gelme yeteneği rakiplerine göre yüksektir				0,589		
İşletmemiz üretim süreçlerinde rakiplerine oranla daha hızlıdır		0,772			0,558	%2,296
İşletmemiz yeni çıkan ürünleri pazara sunma konusunda hızlıdır		0,792				
İşletmemiz müşteriye hızlı ve zamanında ürün ve hizmet dağıtımı yapar		0,546				
Toplam						%70,708
Kaiser-Meyer-Olkin Ölçek Geçerliliği						0,918
Bartlett Küresellik Testi Ki kare						4275,391
sd						66
p değeri						0,000

Tablo 5'teki sonuçlara göre; ilgili maddeler çıkarıldıktan sonra, geriye kalan 12 maddelik Örgütsel Çeviklik ölçeği 4 faktörde incelenmiş olup, yapılan analizler sonucunda KMO değeri 0,918 olarak bulunmuş ve Bartlett Küresellik Testi sonucuna göre X2=4275,391 (p<0,000) olarak elde edilmiştir. Bu değerlere göre, değişkenlerin faktör analizine uygun olduğu belirlenmiştir. 4 faktörün toplam varyansı açıklama oranı %70,708 oranında elde edilerek, analizde belirlenen 4 faktörün birlikte maddelerdeki toplam varyansın ve ölçeğe ilişkin varyansın önemli

bir kısmını açıkladığını göstermektedir. Faktör analizinde öz değerlerin 1'in üzerinde olması beklenirken (0.7/0.5 tolerans edilebilir), daha önceden geliştirilmiş faktör analizi üzerinden kendi belirlediğimiz faktör sayısı göz önünde bulundurularak öz değerler göz ardı edilmiştir.

Tablo 6. Örgütsel Çeviklik Ölçeği Güvenirlik Analizi

	Cronbach's Alpha	Madde Sayısı
Yetkinlik	0,871	5
Hız	0,878	3
Esneklik	0,919	2
Cevap Verme	0,877	3
Örgütsel Çeviklik Ölçeği	0,933	12

Tablo 6'da yer alan Örgütsel Çeviklik ölçeği güvenirlik analizi sonuçlarına göre, tüm ölçeğin iç tutarlılık katsayısı cronbach's alfa değeri 0.933 olarak elde edilmiştir. Bu değerin yüksek derecede güvenilir olduğu söylenebilmektedir. Yeterlilik, hız, esneklik ve cevap verme alt boyutlarının güvenirlik düzeyleri 0,871-0,919 arasında olduğu incelenmiş, alt boyutların güvenilir düzeyde olduğu sonucuna varılmıştır.

5.3. Regresyon Analizi

Çalışmada ortaya konan iddia hipotezi ve alt boyutlar arasındaki ilişki basit regresyon analizi ile test edilmiştir. Öte yandan, literatür taraması sonucunda, konu ile örtüşen araştırmalar olduğu gözlemlenmiştir. Bu doğrultuda, çalışma ile benzerlik gösteren araştırma sonuçları, çalışmanın ilgili bulguları altında tartışılmıştır.

Tablo 7. Yenilikçi İKY'nin Örgütsel Çeviklik Üzerindeki Etkisi

Örgütsel Çeviklik	B	Standart hata	Beta	t	p	R^2
Sabit	1,817	0,078		23,216	0,000**	0,614
Yenilikçi İKY	0,627	0,022	0,783	28,081	0,000**	
**p<0,01; *p<0,05						

Tablo 7'de yer alan katsayılara ilişkin denklem aşağıda yer almaktadır.

(1) Örgütsel Çeviklik= 1,817+0,627*Yenilikçi İKY

Denklem (1)'e ilişkin katsayılar tablo 7'de test edildiğinde, bağımsız değişken yenilikçi İKY'nin, bağımlı değişken örgütsel çeviklik üzerinde etkisinin istatistiksel olarak anlamlı olduğu belirlenmiştir ($p<0,01$). Bu durumda çalışmanın iddia hipotezi doğrulanmış, yenilikçi İKY'de bir birimlik artışın, örgütsel çeviklik üzerinde 1,627 birimlik bir artışa neden olduğu ortaya çıkmıştır. Ayrıca, $R^2=0,614$ olduğu için; Yenilikçi İKY'nin Örgütsel Çevikliği %61,4 oranında açıkladığı söylenebilmektedir.

Literatürde bu bulgular ile benzerlik gösteren araştırma sonuçları mevcuttur. Bazı araştırmalar yenilikçi İKY ve örgütsel çeviklik kavramını kullanırken, bazıları aynı

çerçevede yer alan yüksek performanslı iş sistemleri ve işgücü çevikliği kavramlarını kullanmışlardır.

Munteanu vd. (2020), 250 ve üzeri çalışana sahip 65 şirket üzerinde gerçekleştirdikleri çalışmalarında, örgütlerde İK uygulamalarının benimsenme derecesinin işgücü çevikliğini artırmaya yönelik olumlu yönde etkisini araştırmışlardır. Bulgular, bazı İK uygulamalarının, işgücü çevikliğinin artışını doğrudan desteklediğini göstermektedir. Bunlar; mesleki becerileri geliştirme fırsatı sağlamak; performansı değerleme ve geri bildirim sağlamak için formel sistemlerin varlığı; mesleki liyakatlerin tanınması için bir teşvik sistemi; çalışan sadakatini sağlama programları; çalışan sağlığı ve güvenliği programları; adil bir ödül ve ödeme politikası; yenilik için sürekli iyileştirme uygulamaları; üste doğrudan kolay erişim; bağımsız çalışma ve ekip çalışması.

Alzola, vd. (2020), İspanya'da bir devlet hastanesinin üç yoğun bakım ünitesinde, 324 yoğun bakım personeli üzerinde gerçekleştirdikleri araştırmada, yüksek performanslı iş sistemlerinin örgütsel çeviklik üzerindeki etkisini doğrulamışlardır. Diğer bir ifade ile, eğitim, katılım, takdir ve iletişim gibi insan kaynakları uygulamaları hastane çevikliğinin geliştirilmesine olumlu katkıda bulunmaktadır.

Sucu (2018), Sivil Havacılık Genel Müdürlüğü iznine tabi Yer Hizmetleri İşletmelerinde çalışan 117 yönetici üzerinde gerçekleştirdiği anket çalışması sonucunda, yüksek performanslı iş sistemlerinin örgütsel çeviklik üzerinde anlamlı etkisinin olduğunu doğrulamıştır.

Saha vd., (2017), insan kaynaklarının örgütsel çeviklik üzerindeki etkisine yönelik geliştirdikleri kavramsal modelde İKY'yi, "çalışanları motive ederek ve ödüllendirerek bir firmanın hedeflerine ulaşmasını sağlayan stratejik yönetim" olarak tanımlamışlardır (s.328). Araştırmacılara göre, insan kaynakları örgütsel çevikliğin geliştirilmesinde kilit rol oynayan başarının temel öğeleridir ve stratejik rolü gereği örgütsel çeviklik üzerinde önemli bir etkisi vardır. Yöneticilere, çalışanları yeniden yapılandırma ve ihtiyaçlarına göre onları dönüştürme konusunda önemli görevler düşmektedir.

Muduli (2017), üretim ve servis sektöründen çalışan 524 kişi ile gerçekleştirdiği araştırmasında, takım çalışmasını teşvik eden bir ortamın örgütsel çevikliğin oluşmasında en fazla etkiye sahip olduğunu ve bunu ödül sistemleri, çalışan katılımı, örgütsel öğrenme, eğitim ve bilgi sistemlerini ele alan programlar izlediğini ortaya koymuştur. Ek olarak çalışma, psikolojik güçlendirmenin çevikliği desteklediğini göstermiştir.

Azizsafaei (2016), 17 büyük kamu ve özel kuruluşun İK direktörleri, çeviklik uzmanları ve üst düzey yöneticilerle yarı yapılandırılmış görüşmeler yoluyla gerçekleştirdiği araştırmada, örgütlerde çevik özelliklerin geliştirilmesine etki eden bir dizi çeviklik odaklı İK uygulaması belirlemişlerdir. Bu uygulamalar, iş tasarımı, öğrenme ve geliştirme, performans yönetimi, personel alımı, yetenek yönetimi, çalışan katılımı, yetkilendirme, iletişim, ödüller ve takdirdir.

Sumukadas ve Sawhney (2004), 54 üretim tesisinde kıdemli operasyon müdürleri ile gerçekleştirdikleri araştırmalarında, güç paylaşımı uygulamalarının işgücü

çevikliği üzerinde güçlü ve önemli bir etkiye sahip olduğu ortaya koymuşlardır. Ayrıca, eğitim, maaş-yetenek temelli ücret ve iyileştirme teşvikleri, finansal olmayan teşvikler, takım bazlı üretim teşvikleri uygulamalarının işgücü çevikliği üzerinde etkisi ortaya çıkmıştır.

Tablo 8. Yenilikçi İKY Alt Boyutlarının Yetkinlik Üzerindeki Etkisi

Yetkinlik	B	Standart hata	Beta	t	p	R^2
(Constant)	1,453	0,083		17,530	0,000**	0,671
YUR	0,288	0,071	0,321	4,041	0,000**	
FAR	0,166	0,076	0,194	2,171	0,030*	
SOT	0,269	0,063	0,063	4,251	0,000**	
**p<0,01; *p<0,05						

Tablo 8'de yer alan katsayılara ilişkin denklem aşağıda yer almaktadır.

(2) Yetkinlik= 1,453+0,288*Yürütme+0,166*Farkındalık+0,269*Sonuçların tatmini

Denklem (2)'ye ilişkin katsayılar tablo 8'de test edildiğinde, bağımsız değişkenler yürütme, farkındalık ve sonuçların tatmininin, bağımlı değişken yetkinlik üzerinde etkisinin istatistiksel olarak anlamlı olduğu ortaya çıkmıştır ($p<0,01$;$p<0,05$). Dolayısı ile yürütme, farkındalık ve sonuçların tahmininde bir birimlik artış, yetkinlik üzerinde sırasıyla; 1,288, 1,166 ve 1,269 birimlik bir artışa neden olduğu tespit edilmiştir. Ayrıca R^2=0,671 olduğu için; yürütme, farkındalık ve sonuçların tahmininin yetkinliği %67,1 oranında açıkladığı söylenebilir.

Ghareeb ve Medabsh (2019), Mısır'da 200 insan kaynakları yöneticisi ile gerçekleştirdikleri çalışmada, İKY uygulamalarının örgütsel yetkinlikler üzerindeki etkisini belirlemeyi amaçlamışlardır. Sonuçlar, insan kaynakları yönetimi stratejilerinin örgütsel yetkinlik gelişimi üzerinde olumlu bir etkiye sahip olduğunu göstermektedir. Bu sonuç, araştırmada ortaya çıkan Denklem 2'ye ait sonuç ile örtüşmektedir.

Tablo 9. Yenilikçi İKY Alt Boyutlarının Esneklik Üzerindeki Etkisi

Esneklik	B	Standart hata	Beta	t	p	R^2
(Constant)	2,746	0,135		20,360	0,000**	0,203
YUR	0,190	0,116	0,203	1,643	0,101	
FAR	0,133	0,124	0,149	1,068	0,286	
SOT	0,094	0,103	0,109	0,916	0,360	
**p<0,01; *p<0,05						

Tablo 9'da yer alan katsayılara ilişkin denklem aşağıda yer almaktadır.

(3) Esneklik= 2,746+0,190*Yürütme+0,133*Farkındalık+0,094*Sonuçların tatmini

Tablo 9, denklem (3)'e ilişkin katsayıların test sonuçlarını göstermektedir. Sonuçlara göre; bağımsız değişkenler yürütme, farkındalık ve sonuçların

tatmininin, bağımlı değişken esneklik üzerinde etkisinin istatistiksel olarak anlamlı olmadığı belirlenmiştir (p>0,05).

Xiu, Liang, Chen ve Xu (2017), 113 KOBİ üzerinde gerçekleştirdikleri araştırmalarında, örgütsel stratejik esneklik ve yenilikçi İK uygulamalarının olumlu ilişkisine dair hipotezlerini doğrulamaya çalışmışlardır. Ayrıca, yenilikçi İKY uygulamalarının stratejik esneklik ve firma performansı arasındaki ilişkiye aracılık rolünü incelemişlerdir. Araştırmacılar, stratejik esnekliğe güçlü bir şekilde odaklanan örgütlerin, yenilikçi İKY uygulamalarını benimseme olasılığının daha yüksek olduğu arabuluculuk ilişkisini destekleyen güçlü kanıtlar bulmuşlardır.

Tablo 10. Yenilikçi İKY Alt Boyutlarının Cevap Verme Üzerindeki Etkisi

Cevap Verme	B	Standart hata	Beta	t	p	R^2
(Constant)	1,658	0,121		13,741	0,000**	0,455
YUR	0,212	0,104	0,209	2,047	0,041*	
SOT	0,258	0,092	0,276	2,805	0,005**	
**p<0,01; *p<0,05						

Tablo 10'da yer alan katsayılara ilişkin denklem aşağıda yer almaktadır.

(4) Cevap verme= 1,658+0,212*Yürütme+0,258*Sonuçların tatmini

Denklem (4)'e ilişkin katsayılar tablo 10'da test edildiğinde, bağımsız değişkenler yürütme ve sonuçların tatmininin, bağımlı değişken cevap verme üzerinde etkisinin istatistiksel olarak anlamlı olduğu belirlenmiştir (p<0,01; p<0,05). Bu durumda, yürütme ve sonuçların tatmininde bir birimlik artışın, cevap verme üzerinde sırasıyla 1,212 ve 1,258 birimlik artışa neden olduğu ortaya konmuştur. Ayrıca R^2=0,455 olduğu için; yürütme ve sonuçların tahmininin, cevap vermeyi %45,5 oranında açıkladığı söylenebilmektedir. Analiz sonuçlarına göre, farkındalığın cevap verme üzerinde etkisinin istatistiksel olarak anlamlı olmadığı ortaya çıkmıştır (p>0,05).

Latham (2014), 15 katılımcı ile bireysel, derinlemesine, yarı yapılandırılmış görüşmeler üzerinden gerçekleştirdiği nitel araştırmada şu soruya yanıt aramıştır: İnsan kaynakları uzmanlarının, takım çalışması performansında esneklik ve yanıt verebilirliğin benimsenmesine bakış açısı nedir? Araştırma bulguları; esneklik ve cevap verme gibi örgütsel çeviklik özelliklerini benimsenmenin yüksek performanslı bir ekip anlamına geldiğini desteklememektedir.

Tablo 11. Yenilikçi İKY Alt Boyutlarının Hız Üzerindeki Etkisi

Hız	B	Standart hata	Beta	t	p	R^2
(Constant)	1,899	0,126		15,067	0,000**	0,370
SOT	0,199	0,096	0,216	2,073	0,039*	
**p<0,01; *p<0,05						

Tablo 11'de yer alan katsayılara ilişkin denklem aşağıda yer almaktadır.

(5) Hız= 1,899+0,199*Sonuçların tatmini

Denklem (5)'e ilişkin katsayılar tablo 11'de test edildiğinde, bağımsız değişken sonuçların tatmininin, bağımlı değişken hız üzerinde etkisinin istatistiksel olarak anlamlı olduğu ortaya çıkmıştır ($p<0,05$). Bu durumda, sonuçların tatmininde bir birimlik artış, hız üzerinde 1,199 birimlik artışa neden olmaktadır. Ayrıca $R^2=0,370$ olduğu için, sonuçların tatmininin hızı %37 oranında açıkladığı söylenebilmektedir. Bunun yanında analiz sonuçlarına göre, yürütme ve farkındalığın hız üzerinde etkisinin istatistiksel olarak anlamlı olmadığı belirlenmiştir ($p>0,05$).

6. Sonuç ve Öneriler

Ülkemiz savunma sanayi sektöründe faaliyet gösteren 10 büyük ölçekli firma üzerinde gerçekleştirilen bu araştırmada, yenilikçi insan kaynakları yönetim (İKY) uygulamalarının örgütsel çeviklik üzerindeki etkisi araştırılmıştır. Gerçekleştirilen basit doğrusal regresyon analizi sonucunda elde edilen bulgulara göre, yenilikçi İKY uygulamalarının örgütsel çeviklik üzerinde anlamlı etkisi olduğu ortaya çıkmış, çalışmanın hipotezi doğrulanmıştır. Bunun yanında, çalışmada ele alınan kavramsal yapıların alt boyutları arasındaki ilişki şu şekildedir:

Öncelikle, yenilikçi İKY uygulamalarının alt boyutları, farkındalık, yürütme ve sonuçların tatmininin, çeviklik alt boyutu yetkinlik üzerinde etkisinin istatistiksel olarak anlamlı olduğu ortaya çıkmıştır. Sharifi ve Zhang (1999) yetkinliği; örgütlerin, amaç ve hedeflerine yönelik faaliyetlerinde üretkenliğini, etkinliğini ve etkililiğini sağlayan kapsamlı yetenekler olarak tanımlamaktadırlar. Bu yetkinlikler; uzun vadeli hedefleri gerçekleştirecek stratejik vizyon, müşteriye sunulan yüksek hizmet kalitesi, uzman ve yetkilendirilmiş insan kaynağı, basit, açık ve net tanımlamış iş süreçleri, işletme içi ve dışında iş birliği ortamı olarak belirlenmiştir (Tablo.6). Buna göre; savunma sanayi firmalarında, yenilikçi İKY uygulamaları konusunda oluşmuş olan farkındalığın, pratikte uygulamaya alınmasının ve bu uygulamaların sonuçları hakkında oluşan genel olumlu havanın (tatmin); üretkenlik, etkinlik ve etkililiği meydana getiren bu yetenekler üzerinde anlamlı bir etkisi vardır.

İkinci olarak; yenilikçi İKY uygulamalarının alt boyutları, farkındalık, yürütme ve sonuçların tatmininin, esneklik üzerinde etkisinin istatistiksel olarak anlamlı olmadığı belirlenmiştir. Esneklik, üretim çevikliği açısından, farklı ürünleri işleyebilme ve aynı üretim tesisinde farklı hedeflere ulaşabilme becerisidir (Sharifi ve Zhang, 1999). Çalışmada, iki esneklik özelliği temel alınmıştır. Bunlar; "farklı ürün modelleri üretme esnekliği" ile "farklı miktarda ürün ve hizmet üretme esnekliğidir" (Tablo.6). Ancak, analiz bulgularına göre, yenilikçi İKY uygulamalarının savunma sanayi firmalarında farkındalığı, yürütülmesi veya sonuçlardan elde edilen tatmin düzeyinin bu iki temel esneklik özelliği üzerinde herhangi bir anlamlı etkisi yoktur.

Üçüncü olarak, yenilikçi İKY uygulamalarının alt boyutları, yürütme ve sonuçların tatmininin, çeviklik alt boyutu cevap verme üzerinde etkisinin istatistiksel olarak anlamlı olduğu belirlenmiş, farkındalığın ise cevap verme üzerinde etkisinin istatistiksel olarak anlamlı olmadığı ortaya çıkmıştır. Cevap verme; değişimi algılama, hızlı, reaktif veya proaktif bir şekilde yanıt verme ve sonucunda değişim

sürecinden avantajla çıkma yeteneğidir (Sharifi ve Zhang, 1999). Çalışmada vurgulanan iki temel cevap verme özelliği şunlardır: (1) değişimin yönünü hissetme, algılama ve bu değişimlere hazırlıklı olma, (2) yenilikler, çevre ve teknoloji kaynaklı değişimlerin hızlı ve zamanında üstesinde gelme (Tablo.6). Bu sonuçlara göre; yenilikçi İKY uygulamaları konusunda farkındalık oluşmasının değişime cevap vermede yetersiz olduğu, ancak uygulamaya geçmenin ve tatmin edici sonuçlar almanın değişimle başa çıkma ve cevap vermede önemli olduğu anlaşılmaktadır.

Son olarak, yenilikçi İKY uygulamalarının alt boyutu sonuçların tatmininin, çeviklik alt boyutu hız üzerinde etkisinin istatistiksel olarak anlamlı olduğu ortaya çıkmıştır. Yürütme ve farkındalığın ise hız üzerinde etkisinin istatistiksel olarak anlamlı olmadığı belirlenmiştir. Örgütsel anlamda hız, görevleri ve faaliyetleri mümkün olan en kısa sürede gerçekleştirme becerisidir (Sharifi ve Zhang, 2000; Sherehiy, vd., 2007). Çalışmada yer alan hız faktörleri şunlardır: üretim süreçlerinde rakiplerine oranla daha hızlı olma; yeni çıkan ürünleri pazara sunma konusunda hızlı olma; müşteriye hızlı ve zamanında ürün ve hizmet dağıtımı (Tablo.6). Dolayısı ile buradan; firmalarda yenilikçi İKY uygulamaları konusunda farkındalık olması ve uygulamaya alınmasının hız yeteneğine katkıda yetersiz kalacağı, ancak uygulamalardan tatmin edici sonuçlar elde edilmesinin hızlı hareket kabiliyeti doğuracağı sonucu çıkmaktadır.

Çalışmadan elde edilen sonuçların sektör açısından umut verici olduğunun altı çizilmelidir. Zira, firmalarda uygulanan; eğitim programlarının, takım çalışması ve iş rotasyonunun, öneri sistemleri geliştirmenin, sosyal faaliyetler ve sosyal sorumluluk çalışmalarının, performansa dayalı bir ücretlendirme sisteminin, mentorluk, personel güçlendirme ve yaratıcılığa yönelik çalışmaların çalışanlar üzerinde tatmin edici sonuçlar ürettiği ve bu sonuçların ise firmaların yetkinlik, cevap verme ve hız yetenekleri üzerinde anlamlı bir etki oluşturduğu söylenebilmektedir.

Hızlı değişim yaşanan, Ar-Ge çalışmalarına dayalı, yüksek teknolojik ürün üreten savunma sanayi firmalarından (Eceral, 2017), hızlı değişim ortamında rekabet edebilmek ve hayatta kalabilmek için aynı hızla cevap vermesi, proaktif olması ve belirli yetkinliklere sahip olması beklenmektedir. Bu açıdan, çeviklik sektörde faaliyet gösteren firmalar açısından oldukça önemlidir demek yanlış olmayacaktır. Dolayısı ile, sektörde çalışan yöneticilerin, insan faktörünün önemli bir rekabet avantajı olduğunu ve insan kaynağına yapılacak yatırımların, firmalara kazandıracağı çeviklik yetenekleri üzerinden önemli avantajlar sağlayacağı göz ardı etmemeleri gerekir.

Literatür incelemesi sonucu bu çalışma ile birebir örtüşen başka bir çalışmaya ulaşılamamış olması sebebiyle, çalışmanın sektörde önemli bir farkındalık, gelecek araştırmalar için ise, önemli bir ön adım niteliği taşıdığı düşünülmektedir. Bununla birlikte, araştırma yenilikçi insan kaynakları uygulamaları ve örgütsel çeviklik konusunu savunma sanayi firmaları özelinde ele almıştır. İleri de gerçekleşecek araştırmaların farklı sektörlerde ele alınması sonuçlar bakımından veri setini zenginleştirecektir. Öte yandan, yenilikçi İKY uygulamalarının tekil olarak örgütsel

çeviklik üzerindeki etkisinin incelenmesi hangi uygulamanın örgütsel çeviklik üzerinde daha etkili olduğunu tespit etmek açısından önemlidir. Son olarak, yenilikçi İKY uygulamaları konusunda, "yeni" uygulamalar ve "yenilikçi" uygulamalar şeklindeki kavram karmaşasını önleyen çalışmalara ihtiyaç olduğunu vurgulamak gerekmektedir.

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