Determinants of NEETs, using Granger Causality Tests: Applications to ECE and Arab Economies

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Abstract

The current paper aims at establishing the likely causality between NEETs and other economic, social and political variables in the countries of Central and East European economies (ECE) with a focus on the situation of Arab economies. A literature review on NEETs has allowed for finding the magnitude and extent of non-regular and vocation education besides non-employment among the youngest segments of the population. Granger causality tests are applied to the available data to establish the likelihood of the determinants of NEETs. The hypotheses for testing relate to the links between NEETs, education, employment, health, and governance variables. The findings show that there is causality between NEETs and other economic, social and governance indicators. The findings also indicate that NEETs do not have common traits as their determinants differ from a country to another. The NEETs have a unique model for each economy that causes or might be caused with one or a range of variables. These results emphasize that countries and especially Arab countries need to monitor NEETs and pursue analyzes that allow for the enhancement of their policy making processes using relevant and accurate information.

JEL: J62; I25.

Keywords: NEETs, Arab countries, ECE countries, Granger causality.

I. Introduction

This paper focuses on the non-educated, non-employed and not on training young people (NEET) as they are among the most marginalized segments of the population in different economies. The present paper provides empirical evidence about the likelihood of causalities related to the occurrence of NEETs. This aims at supporting educational, employment and social policies targeting these categories of youth.

This paper is motivated by the previous available literature on NEETs. The inputs from series of international organizations that have been clarifying, measuring and ensuring country comparisons on different issues related to this subject, are also among the motivating factors with variations in the age groups of youth considered in each economy.

The NEETs population segment is 16-24 in the UK while it is 15-34 in Japan. In Australia, the age group is between 15 and 29. This constitutes 12.5 % of the youth that are NEET. For Canada, this same group represents 13 % of total youth. For the USA, those under 25 years that are NEET represent 15 % of total youth. NEETs exist in all types of economies. While developed countries have been setting strategies for the inclusion of these segments of the population, developing countries are more in need of tools to reduce the likely impacts of this phenomenon. From the available literature, international organizations related to the European Union, the OECD, the ILO and the World Bank have been active in clarifying this problem with creating further incentives for its monitoring through the development of relevant statistics. The scarcity of information and statistics on most developing economies is a limiting factor especially when willing to set longer time series about NEETs.

But, these variations include also the types of NEETs with their own motivations and willingness to leave education and not to search for jobs. They can be also currently and in the future, the poorest segments of the population. Awareness about their current existence and their likely future destiny, require continuous monitoring and sustained feeding of economic and social policies with inputs relevant to the type of NEETs and to the socio-economic and cultural contexts. The knowledge of determinants of the access to this status besides the ones related to their likely fall into poverty is a necessary piece to ensure directions and content of relevant policies. Employment policies and mainly the quality of labor in addition to educational policies are the most likely direct sets of determinants. But health and social policies appear also to be important drivers to explain the access to the status of NEETs with eventual fall into poverty. This implies that the safety nets for both educational pursuit and poverty avoidance play important roles in setting relevant policies.

Series of research questions and hypotheses could be raised at this stage of the research. These include mainly the following two types of questions:

- What are the most important determinants of NEETs in series of contexts for which data are available? It is assumed that the likely determinants account for education, employment, health, social, macroeconomic and governance variables,
- How NEETs affect the above variables and how the monitoring of NEETs could be an enhancer of the economy and society?

This present paper is composed of three sections. The first one is an introduction of NEETs based on the related literature review. The second section focuses on the data and empirical method used. The third section introduces the findings with their discussion.

II. Literature Review

In order to provide economic and social policy inputs related to education and employment of youth in Arab countries, series of projects have been developed. The SAHWA project is among the ones developed for Arab countries. In this context, Tholen (2015) combines two different theoretical concepts of social inclusion and social exclusion in the fields of education and employment in five Arab Mediterranean countries (Algeria, Morocco, Tunisia, Egypt and Lebanon) using the UNDP Human Development Index.

But, NEET with its related measurements is the most prevalent framework used by series of organizations and authors. Sweenie (2009) draw on the extensive work of Castells (2005) in his analysis of the transformation of work and employment in advanced developed economies in their shift from agricultural to industrial and then to postindustrial or knowledge or informational economies, in recognition of the increasing importance of occupations with a high knowledge content in their activity. Along these lines of analysis, NEETs are the response to the changes from manual and manufacturing activities to more knowledge intensive occupations. This trend has had implications for job requirements and for education with decreasing working niches for unskilled and non-educated labor. Tables 1 to 3 summarize the role played by the globalization process in shifting economies from traditional sectors to more knowledge intensive activities with implications on the jobs and work qualifications with applications to Arab countries (Driouchi, 2014).

Table 1: Comparisons between old industrial economy and knowledge economy

Issue	Old Industrial Economy	New Knowledge Economy
Markets		
Economic Development	Steady and linear, quite predictable	Volatile - extremely fast change, with explosive upsurges and sudden downturns, and chaotic – the direction of the economy's changes is not perfectly clear
Market changes	Slow and linear	Fast and unpredictable

Economy	Supplier-driven	Customer- driven
Lifecycle of Products and Technologies	Long	Short
Key Economy Drivers	Large industrial firms	Innovative entrepreneurial Knowledge- based firms
Scope of Competition	Local	Global Hyper-competition
Competition: Name of the Game	Size: The big eats the small	Speed: The fast eats the slow
Marketing: Name of the Game	Mass marketing	Differentiation
Enterprise		
Pace of Business	Slow	Appreciably faster with ever-rising customer expectations
Emphasis on	Stability	Change Management
Business Development Approach	Strategy pyramid: vision, mission, goals, action plans	Opportunity- driven, dynamic strategy
Success Measure	Profit	Market capitalization (the market price of an entire company)
Organization of Production	Mass production	Flexible and lean production
Key Drivers to Growth	Capital	People, Knowledge, Capabilities
Key Sources of Innovation	Research	Research, systemic innovation, knowledge management, integration, new business creation, venture strategies, new business models
Key Technology Drivers	Automation and mechanization	Information and communication technology, e-business, computerized design and manufacturing
Main Sources of Competitive Advantage	Access to raw materials, cheap labor, and capital for conversion; cost reduction through economies of scale	Distinctive capabilities: institutional excellence, moving with speed; human resources, customer partnership; differentiation strategies; competitive strategies
Scarce Resource	Financial capital	Human Capital
Decision Making	Vertical	Distributed
Innovation Processes	Periodic, linear	Continuous, Systemic Innovation

Production Focus	Internal processes	Enterprise- wide business process and entire value chain
Strategic Alliances with other Firms	Rare, "go alone" mindset	Teaming- up to add complementary resources
Organizational Structures	Hierarchical, bureaucratic, functional, pyramid structure	Interconnected subsystems, flexible, devolved, employee empowerment, flat, or networked structure
Business Model	Traditional: command-and-control	New business model: refocused on people, knowledge, and coherence
Workforce		
Leadership	Vertical	Shared: employee empowerment & self- leadership
Work force characteristics	Mainly male, high proportion of semi-skilled or unskilled	No gender bias; high proportion of graduates
Skills	Mono-skilled, standardized	Multi-skilled, flexible
Education Requirements	A skill or a degree	Continuous learning:: It's not what you know, it's how fast you can learn
Management-Employee Relations	Confrontation	Cooperation, teamwork
Employment	Stable	Affected by market opportunity / risk factors
Employees Seen as	Expense	Investment
Sectors	Manufacturing-Metallic-Electrical-Large constructions-Chemical and food processing.	Electronic-Pharmaceuticals-Aeronautic-Processed food and new equipments but mainly Information Technologies and others.

Source: Vadim Kotelnikov at http://www.1000ventures.com/vk.html with the row on sector added by the authors of the proposal

But, when considering the economies of MENA, the traditional sector does seem to be important even though its sustainability does not seem to be evident. The most important characteristics of this area of production are that formal education is not the main driving force of this sector. The following table (Table 2) introduces the main elements that relate to this traditional area of skills.

Table 2: Descriptive elements of traditional economy

Issue	Traditional Economy
Markets	
Economic Development	Steady and linear, quite predictable and seasonal
Market changes	Slow and linear
Economy	Supply driven
Lifecycle of Products and Technologies	Short
Key Economy Drivers	Small familial businesses
Scope of Competition	Local and proximity
Competition	Not important
Marketing: Name of the Game	None
Enterprise	
Pace of Business	Very slow
Emphasis on	Stability
Business Development Approach	Family organization
Success Measure	Other small businesses
Organization of Production	Small production
Key Drivers to Growth	Involvement of family members
Key Sources of Innovation	None and transmission within the family
Key Technology Drivers	Manual with limited tools
Main Sources of Competitive Advantages	Access to raw materials, unpaid family labor,
Scarce Resource	Financial capital
Decision Making	Hierarchical and family
Innovation Process	Limited to transmission within the family
Production Focus	Internal processes
Strategic Alliances with Other Firms	Rare, "go alone" mindset
Organizational Structures	Pyramid structure
Business Model	Traditional: command-and-control
Work Force	
Leadership	Old and male led

Work force characteristics	Mainly male, high proportion of semi-skilled or unskilled
Skills	Mono-skilled, standardized
Education Requirements	A skill acquired from the family or experience; traditional education can be a plus.
Management-Employee Relations	Patriarchal
Employment	Stable
Employees Seen as	Expense
Sectors	Agriculture, Handicrafts and commerce

Source: Using the above model with information from Driouchi (2004): Introduction to knowledge economy in Morocco, pp: 7-10.

A qualitative description of the presence of knowledge based economies in the MENA region is provided by Oukil (2011). The following table (Table 3) shows that most new industries and related enterprises are present in the region and that most countries have a variety of new knowledge based industries.

Table 3: Public and private technology development through industrialization efforts in the MENA region

Industry	Country													Sector	
Industry and technology	1	2	3	4	5	6	7	8	9	10	11	12	13	Public	Private
Aerospace industry	✓		✓	✓		✓				✓			✓	✓	✓
Car manufacturing	✓	✓	✓	✓			✓	✓		✓		✓	✓	✓	✓
Capital goods	✓													✓	✓
Chemical	✓	✓	✓	✓	✓		✓		✓	✓	✓	✓	✓	✓	✓
IC technologies	✓	✓	✓	✓		✓			✓	✓		✓	✓	✓	✓
Micro-electronics	✓	✓	✓	✓	✓	✓		✓		✓	✓	✓	✓	✓	✓
Pharmaceutical industry	✓		✓	✓		✓		✓		✓	✓	✓	✓	✓	✓
Software industries	✓	✓	✓	✓		✓		✓		✓	✓	✓	✓	✓	✓
Nanotechnology	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	
Biotechnology	✓		✓	✓						✓		✓	✓	✓	
1=Algeria, 2=Bahrain, 3=Egypt, 4=Jordan, 5=Kuwait, 6=Lebanon, 7=Libya, 8=Morocco, 9=Oman, 10=Qatar, 11=Saudi Arabia, 12=Tunisia, 13=UAE															

Source: Oukil (2011)

But Europe appears to have had important changes and shifts in the nature and types of job qualifications and requirements compared to Arab economies. Dolalo (2015) analyzes the employment problem in European countries with the definition of NEETs that includes the unemployed, school dropouts and all those discouraged college graduates who still have not found a job. The NEET rates for the EU27 countries in 2013 and their changes since 2008 are discussed for individuals aged 25-29. As shown, the 2011 rates for 15-29 year-olds in OECD countries, including the slightly older group adds between 2 (Italy) and 9 (Spain) percentage points to the NEET rates of 2008. But several authors require that extensive knowledge on the background characteristics, problem load and future prospects

of NEETs are needed to enhance the efficiency of the inclusive actions. Signe (2017) discusses the situation of the disconnected youth aged 18 and 29 in relation to the lack of knowledge about their specific characteristics, even under the intervention efforts for their inclusion. The investigations made by this author show that there are large heterogeneities in this group and that specific actions are required for almost every individual. Holt (2017) concludes his paper on the Norwegian context for NEETs, by suggesting how research based on meeting young people can contribute to a body of knowledge that has mainly been produced by only counting the NEETs. Mawan et al. (2017) show that there is no evidence that intensive multi-component interventions effectively decrease unemployment amongst NEETs. This authors also how the quality of current evidence is limited. This leaves policy makers under-served when willing to set new programs, implying a neglect of the vulnerable population. Hyejin and Bong (2017) analyze the risk factors related to NEET in South Korea. The authors examine how individual and family characteristics at ages 16–17 affect the probability of being in NEET during 20–25 years old. The results of their analysis reveal that the rate of NEET among poor youth is about four times higher than that those for the higher income group in 2014.

The number of young people, not in education, employment or training (NEETs), is high in Arab countries as noted by ETF (2015a). NEETs in total youth are around 32 %, 36%, 29 % and 40 % in Tunisia, Palestine, Jordan and Egypt, respectively. This rate is higher for young women. It increases significantly with age. Those with higher education are not NEETs relative to those with lower education (ETF, 2014). Low educational attainment increases the risks of becoming NEETs. High and early dropouts from schools as in Algeria, Egypt and Morocco (Martin and Bardak, 2012), contributes to increasing the NEETs. These data are confirmed for Arab countries (World Bank, 2010).

Ragui and Levison (2013) emphasize that the importance of NEET as a measure that is increasingly used in OECD countries (OECD 2011). This measure does not account for youth in marginal employment. It captures youth segments not choosing employment and not searching for it. The NEET measure is not available for most developing countries. The ILO has proposed a number of measures that attempt to capture the extent of labor quality.

ILO (2012) considers that he share of youth not in employment or education/training, as a percentage of the youth population (the NEET rate), is non-negligible in developed economies. In Japan, New Zealand and the United States, for example, the NEET rates were 9.7, 13.1 and 15.6 per cent in 2010 respectively whereas the average for the OECD was 12.8 per cent in this year. The NEET rate in the European Union at the beginning of the 2000s was just above 13 per cent but came down to 10.9 per cent before the global economic crisis in 2007 and 2008. However, due to the global economic crisis, the downward trend in the NEET rate in the European Union was broken, resulting in an increase by 1.9 percentage points in the average rate between 2008 and 2010. The rate in the latter year exceeded 15 per cent in Bulgaria, Ireland, Italy, Latvia, Romania and Spain. The crisis-induced increase

in the European Union was much greater for young men, at 2.6 percentage points compared to 1.1 percentage points for young women.

The UK National Office of Statistics (2016 & 2017) shows that 853,000 young people (aged from 16 to 24) in the UK are not in education, employment or training (NEET). This is an increase of 5,000 from July to September 2015 and a decrease of 110,000 from a year earlier. Less than half of all young people in the UK who are NEET are looking for work and available for work and therefore classified as unemployed. The remaining are either not looking for work and/or not available for work and therefore classified as economically inactive. There are 826,000 young people (aged 16 to 24) in the UK who are not in education, employment or training (NEET), a decrease of 31,000 and down 36,000 from a year earlier. From July to September 2016, the percentage of all young people in the UK who are NEET is 11.5%, down 0.4 percentage points and down 0.4 percentage points from a year earlier.

ILO (2012; 2013a; 2013b; 2015 & 2016) is referring to the labor force and using NEFLET "neither in the labor force nor in education or training". NEFLET is similar to NEET but excludes the unemployed youth (who are part of the labor force). According to the high Planning Commission (HCP, 2015 & HCP, 2017), 25 % of the youth aged 15-24, are not in school, not employed and not on training. This concerns 1.685.000 young people with 44 % females (1.319.000) and 11.7 % males (366.000). Bardak (2012) states that NEET could represent 40 % of the youth in Jordan, Egypt, Syria, Algeria, Tunisia and Morocco. Kocoglu (2014) focuses on the NEET as indicator for identifying young people that are disconnected from education and jobs. To the author, there is a scarcity of data regarding NEETs and the difficulties they are facing in South Mediterranean countries. The rare data available mainly from ILO show that the NEET rate is 25% in Algeria, 32% en Egypt. For Morocco, the World Bank (2012) estimates this rate for 15-29 years, at the level of 50 % based on the survey of 2000 households in 2010. The rate is higher for females.

For OECD countries (OECD, 2014), about 15% of people aged 15-29 are not employed nor in education and training (NEET) with women more likely NEET than men. The proportion of 15-29 year old not in education decreases from 41% in 2008 to 36% in 2012. On average among OECD countries, about 40% of 15-29 year old working part time would like to work more. The number of graduates who are neither employed nor in education or training (NEET) has been growing throughout OECD countries. For this reason, it is important to have high-quality upper secondary programs that provide individuals with education opportunities to ensure higher probabilities for jobs after graduation (OECD, 2016).

For Bardak (2014), the level of the NEET rate is serious in Arab countries as it exceeds the one for EU28 average. It increases from the age group 15-24 to 15-29. It reaches 41% in Egypt, 35% in Palestine, 32% in Tunisia and 29% in Jordan for the age group 15-29. This implies that at least one third of the youth aged 15-29 is not in education or training, and not employed. Also, there is a gap in the NEET rate between males and females. There are 40-percentage points difference between males and females in the NEET rate in Egypt, 30 percentage points in Jordan, 23 in Palestine and 20 in Tunisia. Female NEETs are inactive in these countries (around 80%), while male NEETs are unemployed. This may be explained by the typical gender roles pushing women to take care of a household, children or other relatives and remain at home.

The ETF report (2015b) shows that the number of NEETs is high in several countries. The NEETs rate is generally above 25% for most countries. But, there are variations between countries, from 15% to 35%. The risk of becoming a NEET increases significantly with age. The highest rate is for ages 25 to 29. Young women are more likely to have higher rates than young men. The difference between males and females attains 30 to 40 percentage points in some countries.

The NEET rate is higher than the 13 % average for the EU. Only few countries have rates close to this average. The rate attains 15% for Russia, Ukraine and Montenegro. It is around 20 % for Armenia, Moldova, Serbia, Macedonia and Jordan and above 25 %, for Albania, Turkey, Georgia, Palestine and Tunisia. Other rates are even higher than 35% (Egypt and Kosovo). Data for males and females are shown in the following table extracted from ETF (2015b).

Table 4: NEET for Males and Females in some European and Arab Countries, 2012, Source: ETF (2015)

Country	NEET males	NEET females
EU 28	12.90	13.40
EU best Luxembourg	6.30	5.50
EU worst (Greece)	19.00	21.30
Albania	27.70	32.50
Macedonia	25.30	24.20
Kosovo	30.00	40.10
Montenegro	17.20	16.60
Serbia	25.10	26.90
Turkey	17.50	39.70
Armenia	14.41	28.83
Georgia	24.50	36.00
Moldova	32.40	25.90
Russia	10.30	18.10
Ukraine	11.30	18.30
Egypt	16.90	53.60
Jordan	15.20	34.80
Palestine	23.40	37.30
Tunisia	21.20	29.90

But the NEET classification has been criticized by authors such as Yates and Payne (2006). Furlong (2006) underlines the shift from unemployment to NEETs. Sabha (2014) emphasizes that NEET captures the percentage of youth discouraged from finding jobs and not willing to improve their skills through training and education. Middle East and North Africa has the highest rate of NEETs with 30% in Egypt, and 25% in Jordan and Tunisia. When including the 29 years old, the rate increases to about 30% in Jordan and 35% in Tunisia. In all countries NEET is much higher for young females. The difference between females and males is high for Egypt and low for Tunisia. But, Sabha (2014) insists on data limitation with the impossibility of establishing causality between NEET and the political changes in the Arab region.

III. Empirical Method & Data

The empirical method used is Granger causality. This is a test that allows for prediction of links between variables. In this sense, x causes y, if x is able to enhance the accurateness of the prediction and forecast of y. The two equations for testing for this latter relationship are given as:

$$X_t = \alpha + \sum_{i=1}^{m} \beta_i X_{t-1} + \sum_{j=1}^{n} \tau_j Y_{t-1} + \mu_t$$

$$Y_t = \theta + \sum_{i=1}^{p} \phi_i Y_{t-1} + \sum_{j=1}^{q} \psi_j X_{t-1} + \eta_t$$

The unidirectional Granger-causality from X to Y means that the X variable increases the prediction of Y but not vice versa and is presented as:

$\sum_{j=1}^{n} \tau_j \neq 0$, and $\sum_{j=1}^{q} \psi_j = 0$

The unidirectional Granger-causality from Y to X means that the Y variable increases the prediction of X but not vice versa and is presented as:

$\sum_{j=1}^{n} \tau_j = 0$, and $\sum_{j=1}^{q} \psi_j \neq 0$

The bidirectional Granger-causality between Y to X means that both the Y variable increases the prediction of X and vice versa and is presented as:

$\sum_{j=1}^{n} \tau_j \neq 0$, and $\sum_{j=1}^{q} \psi_j \neq 0$

The independence between Y to X means that there is no Granger causality between the two variables and is presented as:

$\sum_{j=1}^{n} \tau_j = 0$, and $\sum_{j=1}^{q} \psi_j = 0$

The data selected are of two main categories. The first category concerns variables for the segments of age between 15 and 24 years old that are directly linked to the NEETs and are: enrolment in education, enrolment in vocational education, enrolment in general education, and employment of youth. The second category relates to government policies that relates to the youth and are expenditure on education, expenditure on health (as percentage from GDP), labor force, voice and accountability, political stability and no violence, rule of law, government effectiveness, regulatory quality, and control of corruption.

With regard to the political variables, each is interpreted differently. The political stability and absence of violence measures the likelihood of a government destabilization by violent means including unconstitutional means and terrorism. For the government effectiveness, it is a measure that gives inducements of the mutual relationship between public and civil services besides political pressure. The regulatory quality measures the government support to the private sector. Concerning the control of corruption, it measures the power exerted by the public sector on the private one. Finally, the rule of law measures the extent at which the law governs the economy.

The paper discusses the causality in two sets, in which the first one concerns the causality between the NEETs and its directly linked variables and the second concerns the causality between the NEETs and the governance indicator. The hypotheses to be tested are summarized in Table 5 and 6.

Table 5: Hypotheses of the causality between NEET and other variables

H_0: NEET does not Granger cause Employment H_A: Employment does not Granger cause NEET
H_0: NEET does not Granger cause Education H_A: Education does not Granger cause NEET
H_0: NEET does not Granger cause General Education H_A: General Education does not Granger cause NEET
H_0: NEET does not Granger cause Vocational Education H_A: Vocational Education does not Granger cause NEET

Table 6: Hypotheses of the causality between NEET and governance indicators

H_0: NEET does not Granger cause Expenditure on Education H_A: Expenditure on Education does not Granger cause NEET
H_0: NEET does not Granger cause Expenditure on Health H_A: Expenditure on Health does not Granger cause NEET
H_0: NEET does not Granger cause Labor Force H_A: Labor Force does not Granger cause NEET

H_0: NEET does not Granger cause Voice and Accountability H_A: Voice and Accountability does not Granger cause NEET
H_0: NEET does not Granger cause Political Stability H_A: Political Stability does not Granger cause NEET
H_0: NEET does not Granger cause Government Effectiveness H_A: Government Effectiveness does not Granger cause NEET
H_0: NEET does not Granger cause Regulatory Quality H_A: Regulatory quality does not Granger cause NEET
H_0: NEET does not Granger cause Rule of Law H_A: Rule of Law does not Granger cause NEET
H_0: NEET does not Granger cause Control of Corruption H_A: Control of Corruption does not Granger cause NEET

The NEET data of Eastern and Central European (ECE) countries are extracted from Eurostat, and covers the period 2000-2015. For Arab countries, data are extracted from the World Bank database. Due to the limited data and lack of longer time series, different reports such as ETFand ILO are used to complete data on Arab countries. Also, some of observations are duplicated over 2 periods of missing data assuming that the NEET rate is the same for two consecutive years. But even under these adjustments, only Algeria, Egypt, Saudi-Arabia and Palestine are considered in the analysis because these countries have appropriate time series length for NEETs. All the remaining independent variables have data as extracted from the World Bank databases.

IV. Results & Discussion

The Granger causality test indicates only the direction of the causality between two variables. For instance if the NEET causes the education, this might imply that the more the NEET group grows, the more the education decreases as it might also infer that the more the NEET group grows, the more the education grows as well. Still, this method gives a better understanding of the link between two variables as it facilitates the initiatives for policy makes by knowing the root issue or causation. P-value results are compared to a critical value of 5%.

Concerning the first set of the ECE countries, the Granger causality test between the NEETs and the direct variables linked to it indicates that there are no significant causality between these variables in Estonia, Latvia, and Lithuania (Table 7).

Table 7: Granger Causality of NEETs and direct variables in ECE countries (set 1)

	Estonia		Latvia		Lithuania	
	F-statistic	P-value	F-statistic	P-value	F-statistic	P-value
NEET does not causes Employment	1.642	0.260	0.041	0.960	0.287	0.758

Employment does not causes NEET	0.765	0.501	0.222	0.808	1.107	0.376
NEET does not causes Education	1.255	0.351	0.317	0.739	1.444	0.292
Education does not causes NEET	0.424	0.673	1.127	0.384	0.253	0.782
NEET does not causes General Education	3.871	0.083	0.364	0.709	1.314	0.321
General Education does not causes NEET	0.401	0.687	1.171	0.372	0.246	0.788
NEET does not causes Vocational Education	2.542	0.159	0.113	0.895	0.279	0.763
Vocational Education does not causes NEET	1.449	0.307	0.340	0.725	0.109	0.898

With regard to the second set, the test indicates that in Czech Republic, both the employment and the general education cause the NEETs as it is shown with high values of the F-statistic that equals 84.047 and 10.335 (Table 8), respectively. This can be interpreted either by the lack of job opportunities in the job market, and the low capacity of the general education in this economy. Thus, policy makers should put emphasis on the relationships between both the employment among youth and general education with this segment group. In the case of Slovakia, findings show similar results as Czech related to employment of youth with a low P-value of 3.1%, which is lower than the confidence interval of 5%. In addition to that, education also causes the NEET in Slovakia, as the p-value equals 4.8%. In this country, no causation is noticed for a specific type of education, but for both the general and the vocational combined together. In the case of Poland, the NEET group causes the employment with a p-value of 3.7% (Table 8). This might be interpreted such as the more NEETs decreases the more employment increases of vice versa.

Table 8: Granger Causality of NEETs and direct variables in ECE countries (set 2)

	Czech		Slovakia		Hungary		Poland	
	F-statistic	P-value	F-statistic	P-value	F-statistic	P-value	F-statistic	P-value
NEET does not causes Employment	5.034	0.166	0.625	0.567	1.596	0.261	5.451	0.037
Employment does not causes NEET	84.047	0.012	6.507	0.031	0.949	0.427	3.928	0.072
NEET does not causes Education	7.101	0.123	0.984	0.427	0.658	0.544	0.493	0.633
Education does not causes NEET	1.684	0.373	5.284	0.048	0.553	0.596	1.086	0.396
NEET does not causes General Education	7.685	0.115	0.097	0.909	0.267	0.772	2.406	0.171
General Education does not causes NEET	10.335	0.088	4.201	0.072	0.249	0.786	0.068	0.935

NEET does not causes Vocational Education	2.151	0.317	1.162	0.375	0.192	0.829	2.508	0.162
Vocational Education does not causes NEET	0.664	0.601	3.832	0.085	0.043	0.959	1.651	0.268

In the third set of ECE countries, both Slovenia and Croatia show no significant causal relationship between the NEETs and the variables directly linked to it. But for Romania, it is noticed that the vocational education causes NEETs with a significant high F-statistic value of 0.9% (Table 9). This might be interpreted such by the vocational education as an attracting element for the NEETs and as this type of education increases it leads to a decrease in among the NEETs. For Bulgaria, two types of causalities are found. The first causality is the NEET causing the education while the second is the NEET causing vocational education with p-values that correspond to 0.9% and 0.2% (Table 9), respectively. This means that policy makes should put emphasis on the relationships between the NEETs and education, and more specifically, the vocational education.

Table 9: Granger Causality of NEETs and direct variables in ECE countries (set 3)

	Romania		Bulgaria		Slovenia		Croatia	
	F-statistic	P-value	F-statistic	P-value	F-statistic	P-value	F-statistic	P-value
NEET does not causes Employment	1.284	0.328	1.769	0.282	1.039	0.403	0.751	0.512
Employment does not causes NEET	2.037	0.193	0.256	0.786	0.923	0.441	2.520	0.161
NEET does not causes Education	0.466	0.644	19.448	0.009	2.046	0.199	61.050	0.090
Education does not causes NEET	2.856	0.116	0.746	0.531	1.675	0.254	0.769	0.628
NEET does not causes General Education	0.332	0.727	2.262	0.220	0.042	0.959	47.602	0.102
General Education does not causes NEET	3.201	0.095	0.055	0.947	2.991	0.115	38.487	0.113
NEET does not causes Vocational Education	1.234	0.341	48.994	0.002	2.857	0.124	5.189	0.297
Vocational Education does not causes NEET	9.051	0.009	0.757	0.526	2.344	0.166	3.217	0.367

Concerning Arab countries, no causal relationship is found for Palestine. In the case of Saudi Arabia, there is a significant double causality with education, meaning that the NEET causes education while also the education causes the NEETs, with the p-value of 2.2% and 2.5%, respectively (Table 10). In Algeria, the NEETs are causing the vocational education with a significant high F-statistic value of 8.191 while in Egypt, the general education causes the NEETs with the significant F-statistic value of 12.54 (Table 10).

Table 10: Granger Causality of NEETs and direct variables in Arab countries

	Algeria		Egypt		Saudi Arabia		Palestine	
	F-statistic	P-value	F-statistic	P-value	F-statistic	P-value	F-statistic	P-value
NEET does not causes Employment	1.149	0.465	2.223	0.204	0.427	0.667	0.243	0.792
Employment does not causes NEET	1.525	0.396	1.698	0.274	0.14	0.871	0.521	0.618
NEET does not causes Education	2.037	0.186	0.182	0.839	6.341	0.022	0.332	0.729
Education does not causes NEET	0.303	0.746	1.639	0.284	6.049	0.025	0.033	0.968
NEET does not causes General Education	2.894	0.107	1.169	0.383	9.127	0.053	0.377	0.701
General Education does not causes NEET	0.337	0.723	12.54	0.011	1.89	0.294	0.005	0.995
NEET does not causes Vocational Education	8.191	0.009	0.026	0.975	2.889	0.199	5.082	0.051
Vocational Education does not causes NEET	0.474	0.637	0.408	0.685	0.651	0.582	1.696	0.261

Regarding the Granger causality of the NEETs rate with governance indicators, the first set of ECE countries show only one causality in Latvia, but no causalities in Estonia and Lithuania. This latter significant causality is the expenditure on health that causes the NEETs with a low p-value that equals 4.7% (Table 11).

Table 11: Granger Causality of NEETs and governance indicators in ECE countries (set 1)

	Estonia		Latvia		Lithuania	
	F-statistic	P-value	F-statistic	P-value	F-statistic	P-value
NEET does not causes Expenditure on Education	0.941	0.435	1.164	0.462	0.776	0.509
Expenditure on Education does not causes NEET	0.393	0.689	11.354	0.081	0.637	0.567
NEET does not causes Expenditure on Health	3.139	0.106	2.813	0.138	0.660	0.543
Expenditure on Health does not causes NEET	2.019	0.203	5.312	0.047	3.239	0.093
NEET does not causes Labor Force	0.875	0.458	1.276	0.345	1.028	0.401
Labor Force does not causes NEET	0.343	0.721	0.318	0.739	1.973	0.201
NEET does not causes Voice & Accountability	0.009	0.990	2.177	0.184	0.672	0.535

Voice & Accountability does not causes NEET	0.232	0.798	2.088	0.195	1.075	0.381
NEET does not causes Political Stability	0.887	0.449	0.068	0.934	4.022	0.057
Political Stability does not causes NEET	0.193	0.828	1.092	0.387	0.632	0.554
NEET does not causes Government Effectiveness	0.595	0.574	0.622	0.564	0.874	0.449
Government Effectiveness does not causes NEET	0.388	0.691	1.967	0.210	0.608	0.565
NEET does not causes Regulatory Quality	0.992	0.412	1.425	0.303	1.201	0.345
Regulatory Quality does not causes NEET	0.347	0.717	0.153	0.861	0.089	0.916
NEET does not causes Rule of Law	0.369	0.703	1.685	0.253	1.318	0.315
Rule of Law does not causes NEET	0.248	0.786	0.247	0.788	0.551	0.595
NEET does not causes Control of Corruption	1.803	0.226	0.371	0.703	0.189	0.830
Control of Corruption does not causes NEET	0.891	0.447	2.939	0.118	2.407	0.145

The second set of ECE countries does not show any significant causality relationship in Hungary. For the Czech Republic, the expenditure on education causes the NEETs with a p-value of 3.6% (Table 12). This can be interpreted by the more the government expenditure on education increases the more the NEETs decrease. For Slovakia, the NEETs cause both the expenditure on health and the voice and accountability with the p-values of 0.6% and 4.0% (Table 12). For Poland, many causal links are found. The expenditure on education causes NEETs, NEETs cause the expenditure on health, NEETs cause political stability, NEETs cause the government effectiveness, NEETs causes rule of law, and NEETs causes the control of corruption, with the significant high F-statistic values of 18.892, 10.198, 9.178, 6.158, 11.906, and 9.745, respectively (Table 12). Poland show that the NEETs causes not only macroeconomic variables, but also have influence on the political variables.

Table 12: Granger Causality of NEETs and governance indicators in ECE countries (set 2)

	Czech		Slovakia		Hungary		Poland	
	F-statistic	P-value	F-statistic	P-value	F-statistic	P-value	F-statistic	P-value
NEET does not causes Expenditure on Education	0.426	0.701	0.104	0.903	0.078	0.926	1.834	0.253

Expenditure on Education does not causes NEET	26.668	0.036	3.976	0.093	0.288	0.757	18.892	0.005
NEET does not causes Expenditure on Health	0.909	0.524	13.972	0.006	0.156	0.858	10.198	0.008
Expenditure on Health does not causes NEET	3.052	0.247	2.752	0.142	0.339	0.722	3.971	0.070
NEET does not causes Labor Force	1.677	0.374	0.255	0.783	1.323	0.319	2.443	0.157
Labor Force does not causes NEET	3.176	0.239	2.703	0.146	0.121	0.887	1.310	0.329
NEET does not causes Voice & Accountability	4.439	0.184	5.274	0.040	0.700	0.522	1.727	0.238
Voice & Accountability does not causes NEET	1.243	0.446	0.477	0.639	0.268	0.771	1.297	0.325
NEET does not causes Political Stability	1.225	0.449	3.051	0.112	0.846	0.461	9.178	0.009
Political Stability does not causes NEET	0.094	0.914	1.875	0.223	0.136	0.875	0.054	0.948
NEET does not causes Government Effectiveness	1.099	0.476	0.093	0.913	2.314	0.155	6.158	0.024
Government Effectiveness does not causes NEET	0.585	0.631	3.525	0.087	0.103	0.903	0.352	0.713
NEET does not causes Regulatory Quality	9.089	0.099	1.411	0.306	0.769	0.492	1.265	0.333
Regulatory Quality does not causes NEET	0.437	0.696	1.187	0.359	0.228	0.801	1.339	0.315
NEET does not causes Rule of Law	1.171	0.461	2.091	0.194	0.709	0.518	11.906	0.004
Rule of Law does not causes NEET	0.561	0.641	0.488	0.633	0.604	0.567	0.342	0.720
NEET does not causes Control of Corruption	1.843	0.352	0.155	0.859	0.301	0.747	9.745	0.007
Control of Corruption does not causes NEET	0.226	0.816	1.821	0.231	0.029	0.972	0.055	0.947

The third set of the ECE countries does not show a causal relationship in Slovenia. But for Romania, NEETs cause the expenditure on education, NEETs cause the political stability, political stability causes the NEETs, and NEETs cause regulatory quality, with the p-values of 4.4%, 3.2%, 4.2%, and 3.7%, respectively (Table 13). In the case of Bulgaria, NEETs cause political stability, as the p-value equals 2.9%. In Croatia, NEETs cause the expenditure on health, labor force, regulatory quality, and control of corruption with the p-values of 3.0%, 0.9%, 3.7%, and 2.6%, respectively.

Table 13: Granger Causality of NEETs and governance indicators in ECE countries (set 3)

	Romania		Bulgaria		Slovenia		Croatia	
	F-statistic	P-value	F-statistic	P-value	F-statistic	P-value	F-statistic	P-value
NEET does not causes Expenditure on Education	4.727	0.044	4.025	0.199	0.104	0.903	1.572	0.283
Expenditure on Education does not causes NEET	1.384	0.305	0.791	0.558	0.539	0.605	1.123	0.385
NEET does not causes Expenditure on Health	1.612	0.258	0.150	0.865	0.244	0.789	6.627	0.030
Expenditure on Health does not causes NEET	0.819	0.475	2.077	0.241	0.874	0.458	0.016	0.984
NEET does not causes Labor Force	3.708	0.073	3.102	0.154	0.891	0.452	11.446	0.009
Labor Force does not causes NEET	2.571	0.137	1.523	0.322	0.404	0.682	0.313	0.743
NEET does not causes Voice & Accountability	2.672	1.123	4.188	0.105	1.406	0.299	1.744	0.243
Voice & Accountability does not causes NEET	0.006	0.995	0.034	0.967	0.819	0.475	0.223	0.805
NEET does not causes Political Stability	5.176	0.032	9.735	0.029	0.386	0.692	0.875	0.458
Political Stability does not causes NEET	4.594	0.042	0.373	0.710	0.838	0.467	0.308	0.745
NEET does not causes Government Effectiveness	0.726	0.510	1.109	0.414	0.311	0.741	1.235	0.347
Government Effectiveness does not causes NEET	0.475	0.636	4.058	0.109	0.549	0.597	1.102	0.384
NEET does not causes Regulatory Quality	4.868	0.037	0.636	0.576	3.401	0.085	5.469	0.037
Regulatory Quality does not causes NEET	2.379	0.148	5.782	0.066	3.131	0.099	0.122	0.887
NEET does not causes Rule of Law	0.219	0.807	4.581	0.092	0.086	0.919	1.679	0.254
Rule of Law does not causes NEET	0.198	0.824	0.855	0.491	1.585	0.263	0.249	0.786
NEET does not causes Control of Corruption	1.989	0.193	0.774	0.519	5.155	0.036	6.435	0.026
Control of Corruption does not causes NEET	1.893	0.206	2.623	0.187	0.011	0.989	4.494	0.056

Concerning Arab countries, Palestine does not show any causal relationship. Algeria shows that the expenditure on health causes the NEETs while the NEETs causes the regulatory quality with the p-values of 0.0% and 0.7%, respectively (Table 14). For Egypt, the NEETs cause the expenditure on

education. In the case of the Saudi Arabia, a double causality is noticed between the NEETs and the labor force.

Table 14: Granger Causality of NEETs and governance indicators in Arab countries

	Algeria		Egypt		Saudi Arabia		Palestine	
	F-statistic	P-value	F-statistic	P-value	F-statistic	P-value	F-statistic	P-value
NEET does not causes Expenditure on Education	N/A	N/A	4.351	0.068	2.235	0.178	N/A	N/A
Expenditure on Education does not causes NEET	N/A	N/A	0.622	0.568	0.358	0.711	N/A	N/A
NEET does not causes Expenditure on Health	0.548	0.598	1.741	0.253	0.699	0.525	N/A	N/A
Expenditure on Health does not causes NEET	36.263	0.000	0.164	0.852	1.992	0.199	N/A	N/A
NEET does not causes Labor Force	0.312	0.739	0.148	0.866	4.815	0.042	2.586	0.155
Labor Force does not causes NEET	0.044	0.958	3.278	0.109	5.554	0.031	0.580	0.588
NEET does not causes Voice & Accountability	0.805	0.477	0.085	0.919	2.778	0.115	2.146	0.188
Voice & Accountability does not causes NEET	0.048	0.953	2.716	0.145	0.095	0.909	0.173	0.845
NEET does not causes Political Stability	0.011	0.989	1.002	0.421	0.426	0.666	1.809	0.233
Political Stability does not causes NEET	0.356	0.710	0.075	0.929	0.093	0.912	0.287	0.759
NEET does not causes Government Effectiveness	1.778	0.224	1.107	0.389	0.967	0.417	1.618	0.265
Government Effectiveness does not causes NEET	0.604	0.568	0.783	0.499	0.223	0.805	0.538	0.606
NEET does not causes Regulatory Quality	9.002	0.007	0.783	0.499	0.015	0.985	1.355	0.318
Regulatory Quality does not causes NEET	0.085	0.919	0.400	0.687	1.295	0.320	0.455	0.652
NEET does not causes Rule of Law	0.503	0.621	1.465	0.303	1.668	0.242	0.135	0.876
Rule of Law does not causes NEET	0.246	0.787	0.076	0.928	0.736	0.506	0.212	0.814
NEET does not causes Control of Corruption	1.359	0.291	0.010	0.989	2.714	0.119	1.827	0.229
Control of Corruption does not causes NEET	1.339	0.296	0.163	0.854	0.066	0.937	0.241	0.793

Findings indicate that simpler models are obtained for Arab countries while complex ones are for ECE countries meaning that only few variables appear to be determining the behavior of the NEETs

in Arab countries. This is illustrated by the absence of the links between the NEETs and political variables among the governance indicators. This could be explained by the lack of data and observations on the NEETs in this region. These latter data emerged recently in the Arab economies and is of prime importance. Thus, there is an urge to keep track with this young segment in order to understand them clearly as to analyze their current situation within their economies.

These findings indicate that for each economy, either in Arab or ECE countries, a unique model is found for the determination of the NEETs. This provides a clear understanding of the policy-making processes based on the specific determinants causing or caused by this young segment.

Conclusion

The NEETs as young people not in education, employment and vocation training do exist in all economies and their existence is related to the attractiveness of both the educational system and the labor market. But, given the available statistics, their prevalence is higher in developing economies where their existence is not always targeted by economic and social policies. Their behavior in relation to regular and vocational education in addition to their attitudes about labor markets and jobs are most of the time considered as factors that lead to their likely exclusion.

As such, NEETs constitute a loss of human capital in each economy, as they are not included in the formal production and trading systems. They consequently generate another level of economic and social losses as none of the productive opportunities is seized by these categories of youth. They also represent a continuous burden to their families and to households. These categories also constitute a burden on society, as they could be important sources of risks and uncertainty through health, safety and other likely requirements. But, the major issue relates to the identification, monitoring and recognition of NEETs as loss and a risk to each economy.

Based on the above, the NEETs could be easily valued in relation to informal economic and social activities as the opportunity cost of their mobilization could be very low. Individuals and groups searching for cheap labor for both informal and illegal enterprises could easily undertake the attraction of this segment to informal and illegal activities. The development of Information and Communication Technologies (ICTs) besides the increasing cheap access to social media and networks could lead unskilled and cheap labor to use these means to value their very limited competencies. In this sense, the NEETs are too vulnerable to the prevailing economic and social conditions but also to the regional and international informal and illegal enterprises.

While these young people aged 15-24 or 15-29 could be NEETs, those that are older need also to be included when accounting for the prevalence and extent of the vulnerable segments. These could also cover part of the old people in society. When observing this trend with regard to gender, females appear to be more vulnerable than men and this gap could become critical in some societies that are still

under gender biases and gender discrimination. In addition, leaving school can occur earlier and before the age of 15. This implies that NEETs could start early and persist over older ages.

Arab economies are in this category with the aggravating global factors related to the educational system and to the high unemployment rates. The early drop-out from school, the lack of jobs and the absence of safety nets in a context where gender is still an issue are factors that emphasize the importance of focusing on NEETs as loss in human capital and in productivity besides all the risks related to the increasing trends of NEETs.

Studies addressing the theoretical and applied sides of the NEETs do exist. They are mainly led by international and regional organization such as the World Bank, the International Labor Organization in addition to the European Training Foundation (ETF). Otherwise, some authors such as Ragui and Levison (2013) emphasize that the importance of NEET as a measure that is increasingly used in OECD countries (OECD, 2007; 2010; 2011 & 2013a and 2013b). This measure does not account for youth in marginal employment. It captures youth segments not choosing employment and not searching for it. The NEET measure is not available for most developing countries. The ILO has proposed a number of measures that attempt to capture the extent of labor quality.

These investigations show that the number of young people, not in education, employment or training (NEETs), is high in Arab countries as noted by ETF (2015a). NEETs in total youth are around 32 %, 36%, 29 % and 40 % in Tunisia, Palestine, Jordan and Egypt, respectively. This rate is higher for young women. It increases significantly with age. Those with higher education are not NEETs relative to those with lower education (ETF, 2014). Low educational attainment increases the risks of becoming NEETs. High and early dropouts from schools as in Algeria, Egypt and Morocco (Martin and Bardak, 2012), contributes to increasing the NEETs. These data are confirmed for Arab countries (World Bank, 2010).

The cross-sectional data from the School-to-work transition survey (SWTS) micro data files data confirm the issue of lack of jobs. The International Labor Organization has been conducting the school to work transition surveys (SWTS) in more than 30 countries between 2012 and 2015. The Arab countries included up to now are Egypt (2012, 2014) with respectively 5198 and 5758 observations, Jordan (2013) with 5405 surveys, the Occupied Palestinian Territories (2013) with 4320 observations besides an older survey for Syria (2007). There are also surveys for ECE countries where the more recent is of 2015. The results of the above surveys as they appear respectively in different publications of ILO confirm the drastic situation of the transition to labor markets in both Arab and ECE countries.

Findings indicate that simpler models are obtained for Arab countries while more complex ones are for ECE countries. This is illustrated by the absence of links between the NEETs and governance

indicators. This could be explained by the lack of data and observations on the NEETs in this region.. Thus, there is an need to keep track with this young segment in order to understand clearly their current situation within their economies.

These findings indicate that for each economy, either in Arab or ECE countries, a unique model is found for the determination of the NEETs. This provides a clear understanding of the policy-making processes based on the specific determinants causing or caused by this young segment. The heterogeneities over countries would hide similar variations in the same economy and consequently the likely diversities among individuals in the NEET segments. Further research is consequently needed to keep up with the increasing need for knowledge and enrichment of policies aiming at including further the NEETs.

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