

INVESTIGATION OF THE LINKAGES CONNECTED TO CHRONIC LEVEL OF YOUTH UNEMPLOYMENT: INEFFICIENCIES IN EUROPEAN LABOUR MARKETS (AND) INSTITUTIONS

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Abstract

Unemployment today poses as one of the most pressing social and economic reality globally; and has gained a new momentum with the emergence of substantiated new version of youth unemployment. This new version of unemployment has had a considerable impact on economic research in order to adres the issues waiting immediate actions. Youth unemployment is not only an important issue standing for young but also a macroeconomic phenomenon largely related to overall unemployment level. Hence it represents a particular importance for the policy makers whose actions needed to stabilise the economy. This work is an attempt to study youth unemployment in Europe which is increasingly reaching to unprecedented levels. It is an alarming fact is that youth unemployment average ratio in European Union countries is more than the double of overall unemployment rate and statistics have been increasingly worrying particularly for those of Southern member of EU and Ireland. Even though economic criss has aggravated the extent of youth unemployment, the impacts of youth unemployment had long been felt before the outburst of the recent economic crisis. While on the one hand it is possible to think of a positive linkage between economic activity and youth unemployment, on the other hand there is not enough empirical evidence to back up this underlined correlation. The channels through which youth and adult people were being effected had been profoundly differentiated and the difference between these two groups had largely been widened unfavourably against the former. The fundamental cause of youth unemployment in Europe lies in the heart of structural factors in which both differences and similarities are found. This work shows that policies, strategies, reforms initiated by labour market institutions and other able bodies

have not been synchronised in their execution. The fact that EU is an Economic and Monetary Union invokes the required level of labour mobility to rebalance the employment level, but this mechanism has not performed well to absorb unemployment in general and youth unemployment in particular.

Keywords: Youth Unemployment, European Union, Structural Reforms, Policy Makers in EU, Labour Markets, Economic Union, International Mobility of Labour, European Commission, Economic Efficiency.

JEL Code: E20, E24, E29

1. INTRODUCTION

The recent statistics points out the fact that Unemployment is a big issue in EU countries in general but Youth unemployment in particular alarmingly shows its real extent where European markets are not showing healthy signs. Not only the numbers that have had reached to endemic levels but also youth aged between 18-25 are the most sensitive representatives of the society as a whole-where the future level of general unemployment- or quality of unemployment-will have affected by their present experiences. It is not surprising to find that the youth unemployment in greater size is not a new phenomenon but dates back long before the recent endemic economic crisis. For long, the speed of youth unemployment ratio has been substantially high to prove the cumulative extent of the EU economies being observed today. The EU statistics warning that average EU youth unemployment is more than twice as much of that average unemployment level-which point to 22.4 percent and 10.7 respectively. The EU countries like that of Ireland and Southern members of EU have been facing much higher rate of youth unemployment of which reaches to intolerable levels as result of which peaceful coexistence in the communities becomes largely at stake. Social upheavals, protests, demanding political and structural changes spreading across the Europe wherein communities had been hardly hits by crisis, mismanagement and partly by corruption in the heart of governments and local governments. Structural changes therefore being demanded on the political set up of governance and changes and reforms regarding labour markets and labour market institutions where hopes of employment and reasonable income of people-especially outcety of those young unemployed-have been attached to. Thus, youth unemployment concept is much bigger than economic crisis issue ever since it had been occurred in 2008 but must be regarded a sensitive socio-economic issue

where immediate political solutions for effective actions becomes *sine-que non* options to be undertaken by National governments and EU governance alike).

In the course of recent decades, the EU economies' labour markets have witnessed major structural changes. The market players had to respond to the changing circumstances in general economic climate, but often the practices in new directions chosen by the business sector were particularly harmful for prospective young employees. The ill-effects of such practices become more conspicuous as the negative impact of the economic crisis had been profoundly felt across the sectors. Service sector have grown at the expense of manufacturing industry over the time and took advantage of the circumstances of the vulnerable employable section of labour force. Those growing service industries not only did provide short-term employment contracts but also did so by offering relatively poor wage outlays. Depending on the particular nature of national practices, short term contracts generally allows employers to skip varying legal obligations, ranging from payment to other domains. Employers increasingly view this strategy as cost-cutting measure in the face fierce competition and gloomy economic outlook.

Empirical research on the cause and nature of youth unemployment is relatively new and in development stage. The findings of IMF research on this respect contends that youth rates of unemployment are much more sensitive to fluctuations in GDP compared to adult rates of unemployment. Regarding the crisis in Europe; this work finds close correlaton between declining economic activity and substantial rise of youth unemployment (Banerji, Angana; Lin, Huidan; Saksonovs, Sergejs (2015). The recessionary years following the crisis in Europe appears to indicatea well-known macroanalytical relationship between changing economic circumstances and formation of youth unemployment (Dietrich, Hans. ; 2013 p.306).

The youth unemployment problem is a long standing issue in Europe; permanent rather than temporary since the major causes are structural and lack of appropriate policies in this regard-than engendered by contemporary policies or the type of governance leading in the country in question. However; the intensified interest in this sphere of economics is relatively new; even the crisis could not stir enough attention on this issue since the attention was drawn on the other aspects of the crisis, growth, income reduction; poverty in general and so on. Moreover; youth unemployment rates across the Europe have been excaberated on average ever since the financial crises had hits the economies Globally. Its importance is as high as ever in Europe since it is eventually identified as precarious factor stands

in the way of European prosperity and future of deeper integration. There is a growing literature on youth unemployment and incidentally scholars contending the issue putting more emphasis on the economic and financial crisis as a asclerator factor. On the other hand, this work finds no significant empirical correspondence between macroeconomic performance and youth unemployment and; to a certain extent; monetary policy (inflation in this case) and youth unemployment.

2. IDENTIFYING THE NATURE AND CAUSE OF YOUTH UNEMPLOYMENT

2.1. The Extent and Impact of Youth Unemployment in EU: Charts Showing Youth Unemployment in EU

Chart 1. Germany

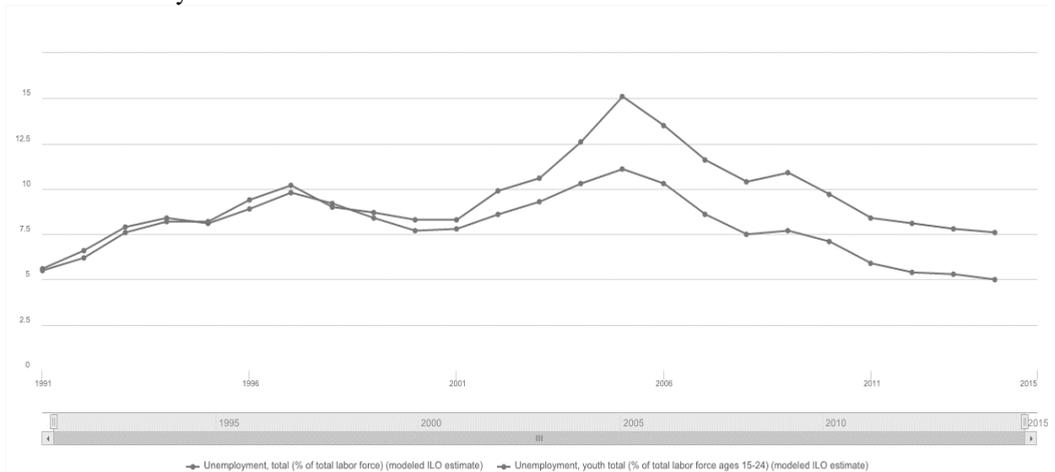


Chart 2. Spain

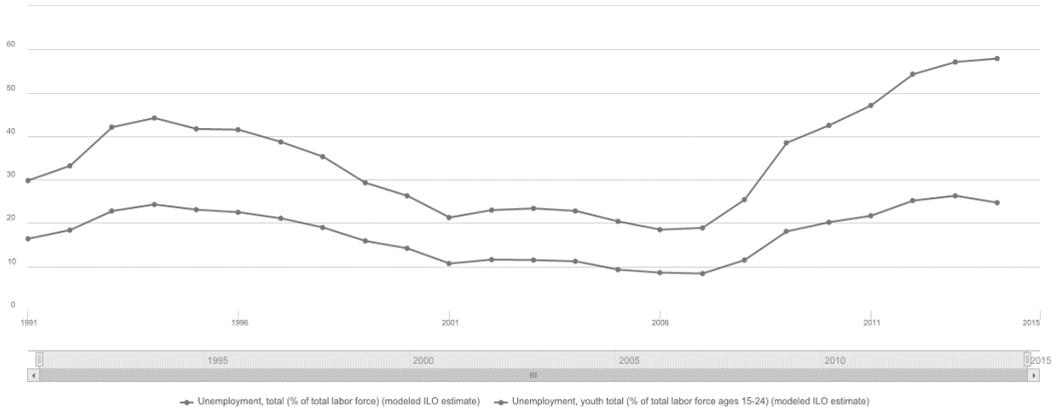


Chart 3. Portugal

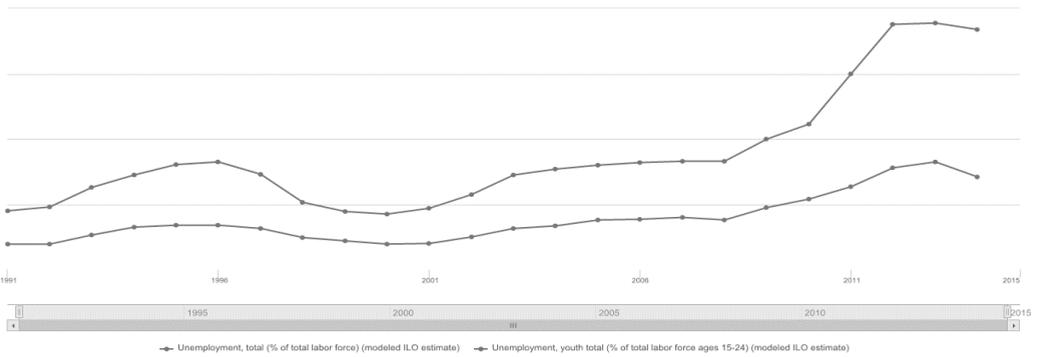


Chart 4. Ireland

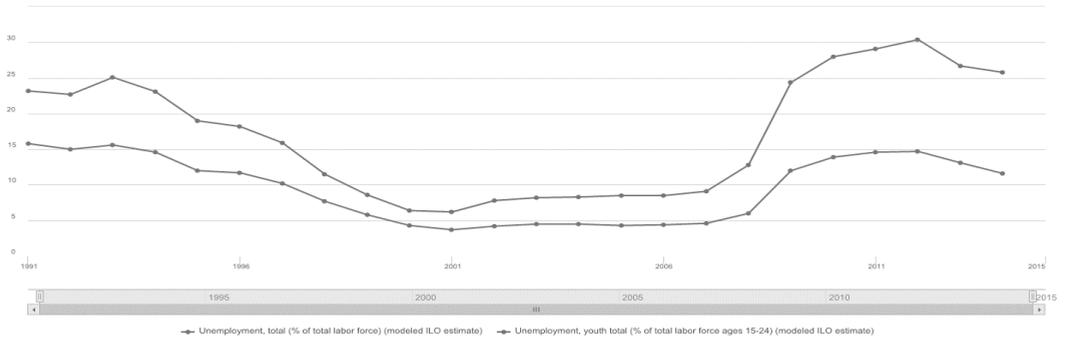
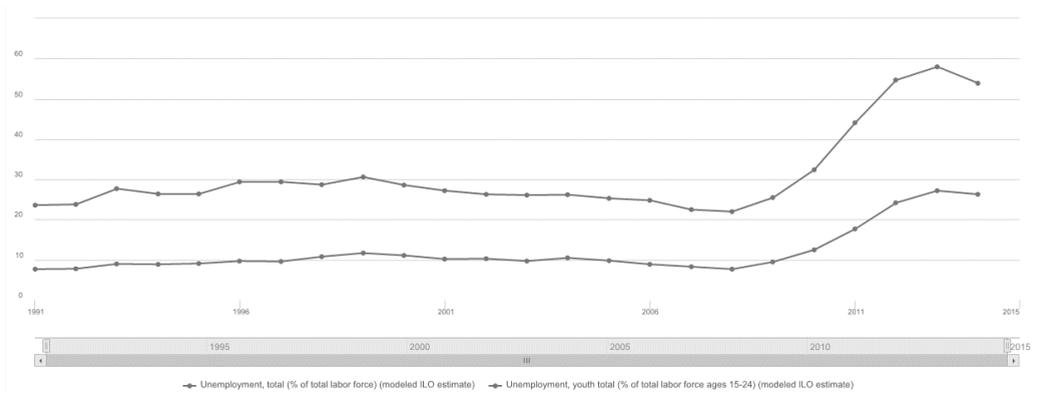
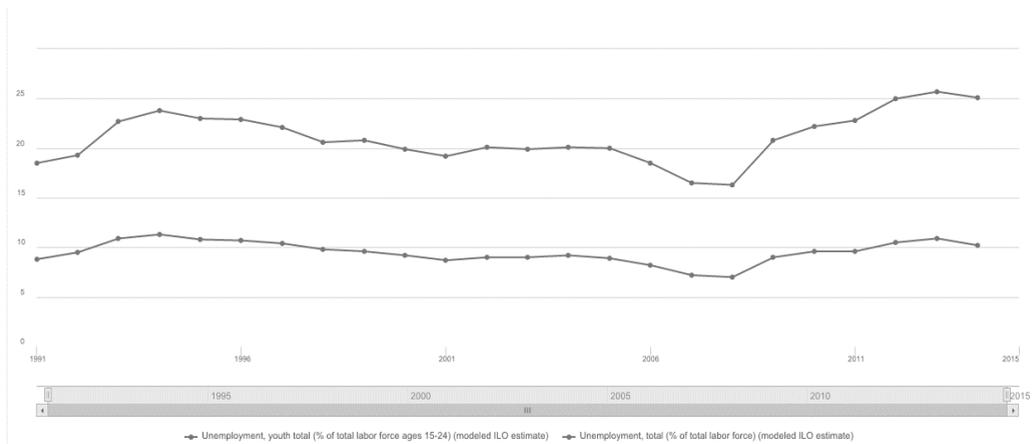


Chart 5. Greece



1.2. Unemployment and Youth Unemployment in EU



1.3. Youth unemployment in EU within the regional context:

The impact of youth unemployment has been felt across-the regions of EU with differentiated size and severity. North, West and South division portray the multi-faceted images of youth unemployment in line of geographical design. The North, marked by the Iskandinavian countries, has been mildly affected on average than other regions. Western countries display a duality within this context: Late members, Poland, Hungary, Chez Republic and oldest member Germany, Netharland, Belgium, Luxembourg and relatively young member Austria. The first group of Central European countries –otherwise known as ex-Soviet Union Block –have performed worse than the latter group. Yet there are few countries have achieved significantly good performance on this score among this category of countries. Despite of serious problems they had encountered, the Western European countries were reasonably beter off on average. Particularly Germany and Austria were to be established as the best performers in EU.

1.3.1. Southern Members and Ireland:

As far as Southern EU members, young members of EU and Ireland concerned, the statistics are somewhat frightening: Grece,55%, Spain, 53%, Ireland 30%, Slovakia 34%, Croatia 43%, Portugal 38%. The lowest rates are belong to those of traditionally strong economies where unemployment rates are lowest: Germany, 8.1%, Austria 8.7 %, Netherlands, 9.5 %. Taking into consideration of

over twenty percent EU average, these group of countries present distinguished successes while the case of former group exhibits a great failure.

Youth unemployment is not a recent agenda for the EU it has been there prior to financial crisis and is still stubbornly high on average EU and reached to descruective levels in some countries. As the extent and magnitude of the financial crisis magnified throughout the Europe, destabilizing impact had to influence various economic and social domains as well as the scale and state of youth unemployment. This underlined spill over effect also encircled some economies with previously low record of unemployment on this count. As a consequence, young people of different ages with relatively good skills across the various professions either had become unemployed by losing a job or become unemployed following the graduation. Immediately after the crisis; Grece had showcased the worst of this kind of scenario in which economic and social destruction were heading to destructive levels. Highly skilled professionalss across the different age groups were suddenly made unemployed and ended up without personal income. It was even more dramatic than this, increasingly people formerly had been working suddenly forced to become homeless.

The youth unemployment rates have increases and tend to further increase in the future for highest qualification class of jobs and those with lowest qualifiction requirements. Naturally, the rate of unemployment in the sectors where the least skilled workers are employed is much higher than the rate of unemployment of those with superior qualifications- i.e.engineers, PhD holders, accountants and so on-but the extent of their unemployment rate is outstandingly high. Comparatively judged, it is much higher than average EU unemployment rate where in the terminology of economics- blame lies in the heart of structural failures for young people in conjunction with economic failures in other spheres.¹

2. STRUCTURAL MAKE UP OF YOUTH UNEMPLOYMENT:

2.1.Skill Mismatch and Unfavorable Contracts and Terms For The Young:

In quantitative terms, for many decades, comparatively the speed of youth unemployment has considerably exceeded that of older persons and became relatively higher than average unenployment given the EU 29 statistics. In the aftermath of the crisis, changes in the economic environment had gradually begun

¹ For a detaied account on this, see Werner Eichorst, Holger Hint, Ulf Rinne(2013)

to generate shifts in the structures of work environment in diverse nature across the Europe. The manufacturing industries were heavily hits as result and the side effect was to enforce a partial transition to services sector. However; service sector by a large were not prepared to offer contracts with good term and conditions for new comers but in partiular young workers were being employed with short term contracts with little protection.

There exists evidence showing that young people, out of obligation, turning to the informal sector in increasing trend for their livelihood. The buffer zone between unemployment and traditional employment is featured by informal, part-time or casual jobs which do not accommodate benefits or security of traditional regular employment. This category also includes subsistence self-employment, or “forced entrepreneurship” can be added to this classification (World Youth Report; 2003,p.67). “Young workers have shifted out of middle-wage, blue-collar occupations and into low-wage, food/personal service occupations. In 1980, 35 percent of young workers were employed in blue-collar occupations; by 2010, that share declined to 19 percent. Over the same period, the share of young workers employed in food/personal service occupations increased from 15 percent to 27 percent (Carnevale, Hanson, Gulish2013).

The side effects of pesent structural problems in labour markets across the Europe continous to extent its sphere of influence as result of which young peoples’ demand for a decent work can hardly be considered seriously. It has been shown that coexistence of two-tier employment protection laws considerably contribute to youth unemployment² Spanish case also illustrate well the aforementioned duality by which fragulant use of contract could be a wide range usage of practice:

Prior to the crisis, Spain was one of the European countries which held the most stringent employment protection for permanent contracts. Paradoxically; fixed-term temporary contracts could be terminated wiyhout cost and almost no control on the fraudulent usage of such contracts. For these reasons, Spanish employers would generate a great number of temporary contracts, so that would become averse to honouring the renewal of contract when the deadline is reached(Dolado, Felgueroso, Jensen,2010,p.4) . Whether getting rid of this duality would have resolve the deadlock, the Spanish authorities were unsure of measures to

² Dual formation of employment protection by a large accounts for labour market disruption and to some extent increases in youth unemployment. This points well documented by (Dolado *et al.*,2010), and Bentolila *et al.*, 2012).

eradicate the dual structure of the labour market. The consecutive reforms have reduced the gap in employment protection between permanent and fixed-term positions, but none of them tackled the root of the problem (Dolado, Felgueroso, Jensen, 2010, p.10). One of the arguments that try to establish the causes for youth unemployment is that the job contracts engaging youth workers are those with very short term and with less social protection than that of older workers. Rather, the young people can mostly acquire temporary jobs from the labor markets they belonged to as opposed to adults with high acquisition rate of permanent employment. The foremost reason for the firms to opt for short term contracts over the choice of long term ones is that their wanting to escape much intense mandatory responsibilities for permanent workers invoked by the labour law. It appears to be true to contend that inherent structural deficiencies inherent in labour markets have been gradually deteriorating ever since the emergence of economic and financial crises.

2.2. Need for Supply-Side Oriented Active Labour Market Policies:

Active labor participation policies should aim not only demand side policy and strategies but also should be able to produce supply side -oriented programs to come up with complementary solutions.³ There is a dual nature of the failures, so that these two symptoms are interconnected. Given the overall global economic climate and rate of growth in EU on average;

The supplied side active labour market policies are multi-faceted measures. The first and foremost is to incentivize the entrepreneurship through providing the wage substitutes and social security contribution by the government. On top of the macroeconomic efforts and incentives, direct intervention be rendered so as to expand the vacancies at the existing firms as well as creation of new vacancies by the prospective start-ups. This mode of intervention is conducive to job creation for the young unemployed persons when operated systematically and rather effectively. Since the labour cost is reduced, effect can potentially cut down unit-labor costs than otherwise would likely to emerge. This case is equally significant not only in offering for secure jobs to those unemployed youth but also instrumental in apprenticeships and undertakings of internship where government must support financially the other actors that actively took part in the process,

³ This point is underlined clearly in, World Youth Report (2003), “Youth Employment”, C.2, P.68).

prominently firms. Firms, thereby would further spurred on providing better quality training throughout the this process in which so-called payment substitute is the shared cost of training of youth by the government. Reasonable payment for the young will boost their spirit and morale and become for the inducement for better career settlement in the future. In the training module of the Germany's system, the apprenticeship as a form of training is an important vehicle through providing the youth with a full-time permanent quality job for the future.

There exist ways of diverse modules of incentives to be offered for the firms to encourage the recruitment of young; among others, such as providing tax incentives, prioritising firms in public bids if when enough commitment is rendered for permanently employing considerable numbers of young people, and so on.

On the other hand, globalisation and environmental concerns sets out series of responsibilities for the governments to carry out-creating prospective vacancies to recruit young people as a concern in this context. Encouraging renewable energy sector, looking after the environment, cleaning polluted sectors, seaside maintenance, land protection, water purification, and other likewise efforts can be utilized when the youngsters concerned energized to contribute to the community and planet they hereby resided in.

Acquisition of jobs through self-employment programs and financial support is another important step to be followed to challenge structural problems wherein there is an abundance of demand for people are to learn running businesses in real life situation with the potential of providing employment for the fellow young people in later stages. In fact, this programs and real activities have long been neglected in Europe, if not meaning to neglect the youth.⁴ Supporting financially and providing technical aid for the traditional cooperatives in their efforts for recruiting young people is important means to overcome structural deficiencies. They can be remedial for the young work force not only in rural areas but also in metropolitan cities or other towns. Small and medium enterprises or other potential Cooperatives can function as ladder for development of entrepreneurial ability and business acumen for the young people concerned. Cooperatives can function to help absorb the brunt of sharp unemployment without sizeable demands from the governments or other institutions, because it is less costly than

⁴ The vitality of investing for the future and future growth through encouraging self-employment has been underlined, see, European Foundation for the Improvement of Living and Working Conditions, (2009, p.63).

host of other popular programs. Producers can merge together within cooperative institutions to survive in harsh competitive environment. The spin off the process provides is being directly creating employment for outsiders especially for those in abject despair. Governments or other institutions, because it is less costly than most of other popular programs.

3. ECONOMIC AND STRUCTURAL DIFFERENCES AT REGIONAL LEVEL

3.1. The obstacles for intra-European Mobility and possible measures for improvement:

This frustrating problematic has long been dominating and have been intensified currently in the face of dramatic increases in youth unemployment rates. The very process through which the current intra-European migration is broken down into sub-categories, the youth age group of 15-25 stands out worst performers compared to other age groups given the current limited degree of intra EU labour mobility.

The measures and policy options that intend to improve labour mobility must be selected with a particular attention to this age group. Increasing the quality and efficiency of human capital will be mutually beneficial for both host and home countries respectively. As far as youth unemployment reality in EU is concerned, the deep-rooted structural problem argument would leave behind little room for maneuvering except that to allow young workers to materialize on their best skills through migration. The argument defends that host country fully exploit youth workers to increase its own welfare and ignore other parties can be invalidated on several grounds. First of all; home country would have immediate benefit to make since it would not be bound to spend welfare expenditures for the individual. The more migrants engaged in work abroad, the less burden will be felt in the coffers of the government. Second; mismatch argument strongly supports the labour mobility through which best match for jobs and workers will be attained; both beneficial for the individual and the economy under question. Third; through the process of finding most suitable post; person's self confidence and productivity would improve. New work venture in another country provides the young worker with good quality of work experience and eventually improving the value of human capital for the concerned individual. Last but not least; if the person returns to home country to work, efficient use of human capital will

contribute to growth and development in this respective country. It is important to comprehend that with the underlined efficiency above, migration have potentials to cure root causes of economic and social problems which are inherently structural.

The factsheet highlights the need for seeking reforms outside the country rather than inside the domestic economy where various options have already been exhausted. Therefore, from this perspective, it is crucial to encourage prospective young workers to seek jobs and training and other work related facilities abroad where potential job availability is high, such as Germany, Netherland, Austria. The focus of future EU policy agenda must be fixated on the like of this strategy and immediate actions must soon be made ready to launch in this regard. Concluding bilateral agreements between pairs of countries must be encouraged along with the EU initiatives aiming to facilitate education and vocational training abroad across the EU countries. Furthermore, upon the completion of education and traing in home country, young unemployed persons must be allowed to join EU and other schemes in an another country and their desire to work abroad must be encouraged and supported. Financial incentives must be provided with at least with the minimum amount for certain period of time. Further cooperation with employment and vocational education services required for financial provisions for youth job seker or trainee. Unified income support and the schemes of the like can be made more accessible and operational promptly without having to cause delays in cashing benefits and supports. A likewise approach can be selected to provide young people with easy Access to accommodation in another country. By choosing to train and work abroad, young unemoloyed persons' dependence on source country's welfare spending is automatically eliminated; in return their commencement at work abroad will pay off for host country's finances at least through taxes they paid. However while language barriers still remains to be a big obstacle, youth unemployed persons or trainees must be given oppotunity to learn and speak home country's language with the complementary provisions nd must be free of charges. Once more and more people coming forth and gaining employment to generate personal income, it would most possibly encourage many others and increased participation from various countries and on aggregate would alleviate the burden of overall unemployment across the EU. On the other hand;

influx of migrants would boost unit labour productivity since mismatch cases in EU labour markets would gradually disappear.⁵

Thirdly; exploiting the option of work abroad in a country other than EU. This type of migration must be encouraged and job seekers be connected to the labour market Networks easily and cheaply for the overseas job vacancies. For many developing countries most of the EU training schemes to be considered as superior and young people must be incentivised to take advantage of it. Moreover; multinational corporations operating overseas welcome workers from abroad who can speak and communicate in English in common standards. Therefore, this looks like promising opportunity; non-English speaking country young prospective workers can get around this barrier relatively easier.

Last but not least; training, job hunting and working abroad are all complementary to young people's adventurous spirit if it is balanced with rather realistic expectations and considerations. This way will divert the directions and hopes of unemployed young people for new ventures abroad.

4. CONCLUSION

Given the vicious cycle which perpetuated especially in the Southern members of EU ever since the 2008 crisis broke out, the state of unemployment and poverty that youth confronted today is likely to overlap in decades to come if necessary measures are not formulated, initiated and implemented rigorously. Youth of today that is suffering from structural deficiencies in the labor market in the labor market by low wages and average income together with working conditions can become catastrophic for the labor market participants regardless of their age rankings.

The lack of labour mobility is at the heart of the structural problems that hinders extending efforts to get employment by the youth. As research in the area suggests, the labour mobility is much lower than inter-state mobility in U.S. as a case of currency union in this respect. It appears that intra-European mobility follows a trend which represents a negative correlation between the extent of youth and/or general unemployment, and labour mobility. Spain is the case in that point: Youth unemployment and average unemployment rate is the highest

⁵ The insight gained from traditional theory of economics stresses that highly realization of labour mobility increases labour efficiency and in return overall productivity.

among the EU members but propensity to migration in EU is on of the lowest. Amid the economic environment where macroeconomic policies are not promising, amid other structural rigidities and market failures, voluntary migration for training and work seems to a favorable option for whom suffering from skill mismatch, lack of quality training and undesirably low level of wages.

Acquisition of jobs through self-employment programs and financial support is another important step to be followed to challenge structural problems wherein there exist an abundance of demand for learning how to run businesses in real life situation with the potential of providing employment for the fellow young people in later stages. Supporting financially and providing technical aid for the traditional cooperatives in their efforts aiming at recruiting young people is important means in overcoming structural deficiencies. Producers can merge together within cooperative institutions to survive in harsh competitive environment. The spin off the process provides is being directly creating employment for outsiders especially for those in abject despair. Trade Union Membership ratio is declining on average across the Europe and excessively low for the young workers. Trade Unions can actively participate to alleviate the cost of youth unemployment, among others, in participation for shaping wage regimes, training programs, counselling services, advising law makers on employment legislations, and so on.

REFERENCES:

- Banerji, A., Lin, M. H. H., & Saksonovs, M. S. “*Youth unemployment in advanced Europe: Okun’s law and beyond*“, No. 15, International Monetary Fund, 2015.
- Bentolila, S., Dolado, J. J., & Jimeno, J. F. “*Reforming an insider-outsider labor market: the Spanish experience*”. IZA Journal of European Labor Studies, 2012, 1(1), 4.
- Biaraschi, C. , Eichorst, W., Giulietti, C.Et.all. “*Youth Unemployment and Vocational Training*”, IZA Discussion Paper Series, IZA DP No. 6890, October 2012.
- Carnevale, A. P., Hanson, A. R., & Gulish, A. Failure to Launch: Structural Shift and the New Lost Generation. Georgetown University Center on Education and the Workforce, 2013.

Choudhry, M., Marelli, E., & Signorelli, M. “*Youth and total unemployment rate: The impact of policies and institutions*”, Rivista internazionale di scienze sociali, 2012.

Dheret, Claire. “*Youth Unemployment-Does the EU care about its future?*”, EPC-European Policy Center, Policy Brief, 26 April 2013.

Dietrich, H. “*Youth unemployment in the period 2001–2010 and the European crisis–looking at the empirical evidence*”. Transfer: European Review of Labour and Research, 2013, 19(3), 305-324.

Dolado, J., Felgueroso, F., & Jansen, M. “*El conflicto entre la demanda de flexibilidad laboral y la resistencia a la reforma del mercado de trabajo en España*”, Papeles de Economía Española, 2010, 124, 84-97.

Eichhorst, W., & Neder, F. “*Youth unemployment in Mediterranean countries*”, IZA Policy Paper, no. 80, 2014.

Eichhorst, W., Hinte, H., & Rinne, U. “*Youth unemployment in Europe: what to do about it?*”, IZA policy paper, no.65, 2013.

European Commission (2012), Moving Youth into Employment, <http://webcache.googleusercontent.com/search?q=cache:ZNEipvAkBn8J:ec.europa.eu/social/BlobServlet%3FdocId%3D9223%26langId%3Den+&cd=1&hl=en&ct=clnk&gl=tr> (Accessed 05.12.2012)

European Commission (2013), Working Together for Europe’s Young People: A call to Action on Youth Unemployment, http://ec.europa.eu/europe2020/pdf/youth_en.pdf (Accessed 19.06.2013)

EUKN (2013), Youth unemployment and geographic mobility in the EU, http://www.eukn.eu/fileadmin/Files/EUKN_Publications/EUKN_Background_Paper_Youth_unemployment_and_mobility.pdf (Accessed 16.04.2013)

International Labor Organization (2013), Global Employment Trends for Youth: A Generation at Risk, http://www.ilo.org/wcmsp5/groups/public/@dgreports/@dcomm/documents/publication/wcms_212423.pdf (Accessed 2013)

Mundell, R. A. “*A theory of optimum currency areas*”, The American economic review, 1961, 51(4), 657-665.

Nedelijkovic, Vena (2014), What is the EU doing to tackle Youth Unemployment?

http://www.bridgingeurope.net/uploads/8/1/7/1/8171506/bref_commentary_eus_youth_unemployment_initiatives_v.nedeljkovic.pdf (Accessed 12.05.2014)

Organization for Economic Cooperation and Development(2013), “International Migration Outlook”, http://biblioteca.hegoa.ehu.es/system/ebooks/19720/original/international_migration_outlook_2013.pdf?1397038775 (Accessed 13.06.2013)

Pedersini, R., & Coletto, D. (2009). Self-employed workers: industrial relations and working conditions.

Rîmbu, G., Constantinescu, L., & Ialomitianu, R. G. “*Particularities of youth unemployment and the labour market in Romania*”, Bulletin of the Transilvania University of Brasov. Economic Sciences. Series V, 2016, 9(1), 237.

World Youth Report (2003), Youth Employment, <http://www.un.org/esa/socdev/unyin/documents/ch02.pdf> (Accessed 2003)