

**MINISTRY OF EDUCATION AND TRAINING
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**SCIENTIFIC BASIS OF THE FORECAST
OF DEMAND FOR HUMAN RESOURCES
WITH COLLEGES AND HIGHER EDUCATION
QUALIFICATION IN VIETNAM**

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INTRODUCTION

1. Reasons for Dissertation's Selection:

Resolution # 29-NQ/TW dated 04/11/2013 of the XI-th plenum of the 8-th Party Central Committee on the principal and comprehensive renovation for education and training has leading opinion: Education and Training development should be linked with the demand for social economic development and the country protection; with the development of science and technology and with the objective rule.

Resolution # 14/2005/NQ-CP dated 02/11/2005 of the Government on principal and comprehensive renovation for education and training for the time period 2006 – 2020 having the same leading opinion: “strong linking of the education and training renovation with the social economic development strategy,…” Prioritization of human resource training for serving the country goal of industrialization and modernization of the country is one of the most important target of the educational development strategy.

There is an increasing demand for high education, reflecting the needs for understanding, the ability of accessing the knowledge and skill as for bringing better incomes in the nowadays knowledgeable economy is predominant. Human resource having colleges and high education sizewise is having increasing tendency but there is a discrepancy between the supply and demand, enterprises are still looking for staff recruitment, while there are still significant numbers of students finishing colleges and universities not having jobs relevant to their specialities. This would require a more precise and scientific forecasting for human resource needs for colleges and high education as for using it as a base for those institutions to define their training structure.

Research themes on forecasting in general, in education and in human resource have been done a lot so far. However, those forecasting themes on the subject of demand for human resources with colleges and higher education qualification have not been done clearly and has recently been focusing on some simulation models of this type. The difficulties on having relevant database when applying those simulation models have been mentioned in the local condition of Vietnam but the alternative solutions either for different variables or finalization of the simulation models should be further proposed with higher convincing level. For those research themes which have been done so far, scientific basis for forming the forecast on demand for resource with colleges and higher education qualification has not been completely solved and the implementation of those simulation models in the local Vietnam conditions has not been clearly defined yet. This would require more systemization, adding both theory and practice as for making those simulation models more convincing and reliable.

Because of the main reasons listed above, the selection of the research themes “scientific base of the forecast of demand for human resources of colleges and high education in Vietnam” is relevant and meeting the current needs of the educational research activities nowadays.

2. Research goal:

Based on the argumenting and practical research to propose procedures, techniques and solutions for improving the conditions as for performing the forecasting for the demand

for human resources with colleges and higher education qualification in Vietnam” with high reliability and meeting the practical requirements.

3. Object and Subject of the research

Research Object: Human resource with colleges and higher education qualification in Vietnam

Research Subject: Forecasting demand for human resource with colleges and higher education qualification in Vietnam

4. Scientific Assumptions

Forecasting demand for human resource (HR) with colleges and higher education qualification in Vietnam is important task of the educational management activities nowadays, it's considered as a base for defining and planning the human resource training policy as for meeting the society's needs.

However, the awareness and the practical implementation has limitations and weakness and if it could be pointed out the factors affecting the HR demand for HR with colleges and higher education qualification and based on that to formulate methods and procedures for forecasting and proposing solutions to strengthen relevant conditions to perform the forecasting thus increasing the forecasting result reliability and this in turn will be a baseline for defining the training policy and utilizing those HR resources.

5. Research tasks:

As for achieving the research goal, the followings main tasks has been done: i) Study for formulating argumentation basis of the forecasting for the demand for human resources with colleges and higher education qualification; ii) Study the experiences of similar forecastings done by another countries worldwide as for possible applying for the forecasting in Vietnam; iii) Analysis and evaluation of actual situation and the situation of the forecasting task in Vietnam; iv) Interpolation of the forecasting results for the demand for human resources with colleges and higher education qualification in Vietnam till the year 2020; v) Proposal for procedures, technique and solution for improving conditions for better forecasting HR demand with colleges and higher education qualification in Vietnam.

6. Themes limitations

HR demand with colleges and higher education qualification has been expressed in the forms of: quantity, structure of the training specialities & quality and within the scope of this research, the themes is focused on the study of scientific basis of the quantitative forecasting methods on the overall demand for human resources with colleges and higher education qualification countrywide.

7. Approach and Research Methodologies:

7.1. Approaches:

The methodology of the forecasting is to study future of the forecast's subject from different aspects such as ontologism, logic and awareness. Dialectical materialism is a

basis for any kind of scientific forecasting. Among the dialectical materialism system and when performing the forecast, special attention should be paid to the causal principle as scientific basis for any kind of prognosis and is a foundation which could be allowed to be relied on that for practical actions to realize the forecasting goals.

Some of the below main approach methods have been used in the research of this thesis:

Logical and historical approach: This is important method for the forecasting on demand for the human resources with colleges and higher education qualification since the future forecasting should be based on the past and present data trending.

Complex approach: forecasting demand for HR with colleges and higher education qualification should be taking this group of peoples in relation with their family and regional economy and working forces as well as the polulation development.

Systematic and structural approach: The sub-system of “human resources with colleges & higher education qualification” is having its own independent development which is corresponded to the general development of the educational and social economic system.

Market demand approach: Evaluating labour market is extremely challenging task for any researcher and labor policy makers, HR analitics as well as the planner for education and training in the coming decades as for eliminating the mismatching between the demand and supply, especially in regard of jobs qualification.

7.2. Research methodology

Theoretical research: Using different methods: analysis, generalization, comparison, collation, logical, historical, theoretical systemization, summarization of the existing research,.. as for clarifying the definitions, categories and based on that formulating the argumenting basis of the forecasting for the demand for human resources (HR) with colleges and higher education qualification.

Practical research: Statististical data collection and its implementation into the simulation/equation for the forecasting of the demand for human resources with colleges and higher education qualification for Vietnam. Summarizing experiences and consulting the experts’ opinions as for further acquisition of necessary info. for serving the thesis’s research.

8. Theoretical points maintained:

- Demand for human resources (HR) with colleges and higher education qualification is having closed relation with the social economic factors (GDP growing rate, average incomes per capita, workforces,...; it’s possible to quantify those relations by correlation coefficient, forecasting equations should be statistically validated. Forecasting result and the reliability is depending on the forecasting method, those factors influencing forecasting equations as well as the conditions for performing the forecast.
- There are lots of capabilities and limitation of the staff performing the forecasting task on the demand for human resources with colleges and higher education qualification in Vietnam. This is well reflected in the evaluation results.
- As in line with the opinion and direction defining for development of the forecasting on demand for human resources with colleges and higher education qualification,

there is a need for having proposal on the procedures, techniques and solutions to strengthen conditions as for making the forecasting such a needs in Vietnam meeting the practical requirement in the very scientific and viable way.

9. New contribution of the thesis

- Theoretical: systemization and forming argumentation basis for the forecasting of demand for human resources (HR) with colleges and higher education qualification through clarification of definitions, social economic factors affecting the needs for human resources, various forecasting methods and validating system for the forecasting equation as well as the conditions related as for making the forecasting result most reliable.
- Practical: Evaluation of the current status for different forecasts conducted so far as well as the current status of those conditions related to the forecasting. Having implemented the relation b/w several social economic factors and the human resources with colleges and higher education qualification in Vietnam in the forecasting equation. Having proposed solutions to strengthen conditions for making this forecasting jobs for the human resources with colleges and higher education qualification in Vietnam most productive ever.

10. Themes structure

Except the Abstract, Conclusion and list of reference materials and appendix, the themes is consisting of 03 chapters

Chapter 1: Argumentation basis and international experiences on the forecasting for demand of human resources with colleges and higher education qualification

Chapter 2: Current status of demand for human resources with colleges and higher education qualification in Vietnam

Chapter 3: Prososal on procedures, techniques and extensive solutions for the conditions needed for forecasting demand on human resources with colleges and higher education qualification in Vietnam.

CHAPTER 1. ARGUMENTATION BASIS AND INTERNATIONAL EXPERIENCES IN FORECASTING THE DEMAND OF HUMAN RESOURCES WITH COLLEGES AND HIGH EDUCATION

1.1. Historical summary of research problem

1.1.1. Themes conducted overseas

Covering human resource development in general and particularly the ones with colleges and higher education qualification: There were lots of scientific research had been conducted with the goal to satisfy the social requirement. Those are theoretical presentations in establishing human resource management strategy but the forecasting method on the society demand for human resource has not been covered yet.

Research and presentation on the theory of forecasting: There are some reference materials such as “Elements of Forecasting” written by Francis X. Diebold (Univeristy of Pennsylvania) or the book “Introduction to Econometrics” written by authors James H. Stock (Harvard University) and Mark W. Watson (Princeton Univeristy).

Some typical forecasting models have been done: 1) Lotus model: was built based on the inter-profession macro-economy model by the Inforum group (Research group of Maryland university, the US) and this model has currently been used for supporting Vietnam (Jobs Department, MOLISA) since 2009. 2) Base Model BLS performed by the (US. Bureau of Labor Statistics). 3) IER model performed by the Institute of Employment Rights (UK). 4) Model IAB - (Institut für Arbeitsmarkt- und Berufsforschung der Bundesagentur für Arbeit done by the Institute for Employment Research, Nuremberg, Germany.

1.1.2. Research themes done in Vietnam

Related to the human resource and the qualified HR development: Do Van Chan's research has stated: Demand for speciality staff is depending on the size, structure and economic development in general and that speciality in particular. Thesis "Scientific basis of defining training structure in the process of global integration" (Phan Van Kha) has shown the inadequate b/w the supply and demand on the human resources with higher education qualification and based on that to point out the scientific basis for defining training structure for higher education.

Researches performed on the forecasting theory and on the qualified human resource could be listed out: Nguyen Dong Hanh in his "Some argumentations and forecasting methods for the development scaling of the education and training in the market economy of Vietnam". The thesis by Tran Huu Nam "Study on implementation of different forecasting methods in education and training" presenting forecasting methods using mathematical functions such as extrapolation trending, linear function and và sơ đồ luồng. Pham Quang Sang with the specialized ministry level thesis "Establishment of forecasting model for development of higher education in Vietnam" has presented opinion on high education development, summary of the development of high education worldwide over the last decades and defining key factors affecting the high education development and based on that to establishing and practicing some forecasting models for prognosing the size and structure of the qualification for high education in Vietnam till the year 2020.

Models and results of forecasting demand for human resource

i) Planning for human resource development for the educational speciality for the period 2011-2020 is scientific task at the Ministry level which has been performed and completed in the year 2010 by the Teacher & Magagement Directorate, in which there were included a topic on forecasting on demand for human resource for educational speciality. ii) Model on labour market **ILSSA-MS**: with the support by the AusAID done by the Labour Science Institute with the cooperation from the Center for Policy Research of the Monash university (Australia) to establish the forecasting model for the labour market in Vietnam and this model is macro simulated on the background of the overall balanced model (2010-2011) with the name ILSSA-MS. iii) Planning for human resource development for Vietnam period **2011 – 2020** là is the ones at the countrywide level which has been defined and approved with the general target "Being able to point out demand on quantity, structure and qualification of the human resources, making sure those meeting the requirement for successfully realizing industrialization and modernization policy for the country, building up and protecting the country, fast

development of those specialities, areas Vietnam has relative advantages over another nations; at the same time listing out solutions for human resources development, forming high qualified human resources meeting the regional and step by step approaching international standards”.

In summary, there are some national and international studies on the demand for human resources however, research must be continued for defining scientific basis of forecasting demand for human resource with colleges and higher education qualification, especially to define the argumentation basis as well as practical basis for implementing those rules affecting the social economic aspects into the forecasting demand for human resources with colleges and higher education qualification.

1.2. Basic definitions related

Forecasting: Studies completed over the last years has been analyzed and confirmed the statement: Forecasting is the scientific prognosing and statistically valid. This statement has exactly reflected a specific characteristic of the forecast.

Human Resources: The definition being used in this themes is being understood as a workforce which could be mobilized and utilized purposely and meeting the requirement needed for the social economic development at the country, speciality, region or any particular trading or manufacturing organization level.

Human resources with colleges and higher education qualification: in line with the above HR definition, it could be stated that Human resources with colleges and higher education qualification are those who have passed the training and have been granted with diplomas and which have been mobilized and utilized purposely meeting the requirement needed for the social economic development at the country, speciality, area or any particular trading or manufacturing organization level.

Demand for Human resource: Demand for HR with colleges and higher education qualification is to be understood as a demand for workforce with colleges and higher education degrees for which the society is expected having.

Training demand: The focus of the research thesis indicated on the demand for training by the region, speciality or countrywide but not going deeply on the demand for training at the individual or enterprises level.

Forecasting demand for human resource (HR): is determining the future of human resource with certain probability. Forecasting demand for human resource is to be understood as being able to point out the human resource information, in regard of quantity, structure and knowledge level.

1.3. Role of forecasting demand for human resource in educational management and social economic development

Forecasting demand for human resource with colleges and higher education qualification is the first step for determining the training needs and is being used as basis for building up the training policy for the colleges and higher education. It particularly plays important role in the human resource training management and in the social economic management in general, especially in the process of planning and information provision of management. Forecasting demand for human resource with qualification is

the first step of the process of making planning for training: Forecasting demand for qualified resources and then to draw an overall picture describing the needs for having trained human resource and this is used to determine the HR demand being trained and this is a basis for determining the training plan.

Role of forecasting demand for HR in the process of planning and policy making: planning is the process of setting up the goals, system of activities and conditions ensuring realization of those goals set. Planning is the first function of the process of management and it's a very basic function as it's related to the implementation of other management functions.

Role of forecasting demand for human resource in providing information: The forecasting demand for HR with colleges and higher education qualification could provide information which could be used for enterprises, training establishments and the society and though allowing them taking part in the labour market (as well as their families) having enough information as for making proper decision and help avoiding unnecessary expenses for themselves and for the society, increasing the working efficiency and developing the jobs & labour market.

1.4. Factors affecting the demand for HR with colleges and higher education qualification

1.4.1. Policy factors:

Policy, strategy for social economic development: Social economic development strategy is the guideline for the HR development orientation of the country

Government investment policy for education: Party and government always consider education is one of the highest priorities among the big policies. Investment made by the government budget would help contributing the build the infrastructure, teaching equipments and increasing the training quality. This is a base for increasing the confidentiality and attracting more peoples taking parts into the training.

Policy for training HR with colleges and higher education qualification: Higher education law has clearly indicated: "teaching students with political quality, morality, professional skills, research ability and development of the application of science and technology matching with the training qualification; having good health; capable of inventing and professional responsibility, adaptable to the working environment and being conscious serving people.

Labour and jobs policy: Training and HR deployment is very closed relationship and having mutual influence each other. If the HR policy for training, distribution and utilization is not synchronized and matching with the market economy mechanism then it would lead to the imbalancing of the labour demand supply which, in turn, would make the increasing of the unemployment for the qualified workforce.

1.4.2. Social - economic factors

Population: This impact on the HR development could be seen from the stand points of affecting the labour supply and demand and this is the core reason for all variables which could help the planner understood what would happen with the jobs and the incomes.

Total workforces: is being considered as important factor affecting on the size of the qualified workforces in general and the ones having colleges and higher education

qualification in particular since it's directly related to the total number of the trained HR at all levels.

Additionally, the percentage of the HR with colleges and higher education qualification of the HR forecasting is usually being used and the forecasting result, based on this index, is having high reliability. In some cases, the quota for this percentage is defined by the management specified in the resolution, guideline and policy on HR development.

With those models for forecasting demand for HR with colleges and higher education qualification, the economical factors such as GDP growrate, average income per capita, percentage of budget spent for education, economical structure, birthrate growing,...have significant impact and having decisive role on the demand for HR with colleges and higher education qualification. Correlation factor b/w GDP and the labour workforces with colleges and high education - $R^2=0.99$ meaning this is very closed and directly propotional. This could be explained that the higher the GDP the higher the number of HR with colleges and high education meaning there is a directly propotional two ways relation b/w the GDP and the HR with colleges and higher education qualification.

Development and shifting economical structure: Vietnam is considered as country with impressive economical growrate over the last years. Economical structure shifting has changed our labour structure in the direction of industrialization and modernization. Workforce in the industrial and services is increasing while the ones in the agriculture sector is decreasing. Economic development leads to the development of the qualified HR and this is an indispensable relation coinciding with the education and training system of the country. Education & training producing required human resource should be following the overall rule. Thus, it should be put into the context of the country economic development with its labour requirement as for being able to do the forecasting on demand for HR with colleges and higher education.

Globalization and world integration: is indispensable process and has created opportunities for developing countries to be integrated into the world economy for increasing the economic growrate and technological renovation. Being globalized there are lots of challenges in addition to the big opportunities for the workers due to the labour competition b/w countries and this is considered as opportunity but at the same time a big challenges for the development of the HR with colleges and higher education qualification in Vietnam.

Education: Higher education is a sub-system of the big public education system and the input of that is provided by the high education system (both quantity & quality, jobs orientation and differentiation). The problem here is Vietnam is developing in term of both economic and sciences & technology thus it's requested that the education and training system should be further strengthen the capability for supplying high qualified human resources as for meeting the needs. Workers incomes: One of the key factor impacting on the education demand is the differentiation on the salary level and the incomes b/w educated and non-educated worker. Studies has shown that for individual workers, qualification and education difference making the incomes difference.

1.4.3. Science and technology factors

Science and technology is increasingly affirmed the role as one of the direct manufacturing force and important for the economy. Forming and developing the knowledge economy should be the highest priority in the development policy. Effective implementation of the science and technology advancement will be technically re-equipping for the major areas of the economy and this would step by step replacing old traditional technology by the new more advanced ones.

1.5. Contents and basic conditions for realization of the forecasting demand for HR with higher education qualification

1.5.1. Major contents of the forecasting demand for HR

The main contents of the forecasting demand for HR with higher education qualification: i) Forecast on the HR supply (workforce) ; ii) Forecasting HR demand (jobs); iii) Balancing the HR demand and supply; iv) Shortterm forecast demand for HR with higher education qualification; v) Forecasting demand for HR with higher education qualification for specific areas of the economy; vi) Forecasting demand for HR for government officers, in the government organisations; vii) Provision of information on the labour market and the labour with higher education qualification.

1.5.2. The main tasks when performing the forecast demand for HR with higher education qualification

As to perform the forecast in general and the ones for the HR with higher education qualification in particular, the following tasks must be performed:

- Defining the forecasting subject and the fastest timing the forecasting should be;
- Understanding the subject to be forecasted, forming system describing forecasting subject and recognizing the key system variables;
- Acquiring necessary data and proposing different assumptions for starting
- Performing the forecast and validating the forecasting result
- Application of the forecasting result

1.5.3. Requirement on conditions for performing the HR forecast

Awareness the role of forecasting HR demand: Forecasting on supply and demand of trained HR in general and the ones with higher education qualification is indispensable part of the overall human resource planning for any country, region and all industries of the economy. Leader's opinion on the task of forecasting jobs will definitely be influencing on the forecasting result. The result of this forecast is considered as important tool for the decision makers in making decision on recruitment, training and policy making.

Forecasters Capability: The forecaster should be able to understand the subject and the problems associated with the forecast and being able to analyze conditions/parameters affecting the forecasting subject, having knowledge on applied statistics, being able to find out the subject's rule in the past and being able to utilize those past data and the analysis result of those influencing factors for creating relevant forecast.

Having relevant and viable forecasting model: One of the reason why till now there is no any systematic, scientific based and viable forecast is due to the lacking of the forecasting model, since the overseas models are usually required huge inputting data

and the local ones have not been developed yet. However, it's advisable to consult with the experts on the forecasting results as to make the forecasting model most productive.

1.6. Some international experiences on forecasting demand on HR with higher education qualification

There are many countries worldwide which have been conducting the evaluation on the labour market and the demand for human resource which would be considered as reference for building up the forecasting model for Vietnam.

1.6.1. US experiences on HR forecast

US. Bureau of Labor Statistics belonging to the Department of Labour of the US government has several models for medium and long term forecasting since 1957. BLS approach methodology is being considered as most comprehensive and consistent and its result has been utilized by various government organizations. This model is based on the correct basis and correctly describing the jobs tendency in general. Each module is being processed step by step and the result of each module is being used as input for another next modules and it's allowed to return back to the previous step. One of the strong advantage of this forecasting model is that it could provide detailed forecast for speciality and profession. However, this model still have certain inaccuracy at some extend and the main reason causing the inaccuracy is due to either the change of labour usage per speciality or the change of staff quota rather than the forecasting process itself.

1.6.2. The UK experiences

IER model implemented by the Institute of Employment Rights (UK). Methodologically, this model is similar to the US BLS model mentioned above. The difference is this model giving more detailed analysis and paid more attention on the demand per speciality and per region, sex (when man labour could not be replaced by woman ones due to the profession speciality). This IER is the macro-economic model representing 49 specialities with more than 1400 equations. The part for jobs forecasting per speciality consisting of 25 specialities and the part for education and training has covered 20 qualifications from low to high level.

1.6.3. Sweden experiences

Shortterm profession forecasting in Sweden is mainly done based on the report evaluation of the government job office (Sweden expression). There are about 200 professions being inspected twice per year. The change in demand for each profession has been done by the job office by: i) Increasing (high or low), ii) Not change, iii) Decreasing (high or low) for the coming year. The evaluation is being done with the following levels: i) Significant shortage, ii) Insignificant shortage, iii) Balancing, iv) Insignificant excess and v) Significant excess.

1.6.4. Other countries' experiences

Some other models such as: Forecasting model for the labour demand supply of the Alberta province (Canada) which is making the forecast on labour market based on the totally balancing model (CGE) from Australia. In New Zealand the forecast on demand and supply is done based on the classification of profession norm, profession classification and investment areas, economic classification...., In Singapore, demand of HR is being forecasted using the economic classification done in 2005 and universities

is not assigned with any quota by the Ministry of Education of Singapore and the student enrollment is set based on their actual capability and actual labour market demand. There are no any completed forecasting model at the national level available in any ASEAN countries yet. Some countries like Phillipine, Indonesia, Malaysia are already having model but has not been widely used yet like in the developed countries.

1.6.5. Lesson for the human resource forecasting in Vietnam

As could be seen there are lots of similarities between various forecasting models mentioned above in regard of labour demand in general as well as for the demand for trained labour, including: (1) Essentially, all the models are replying on and outputting the forecasting for labour demand per economic sectors and jobs specialities; (2) forming the forecasting model is based on its own country economy; (3) Jobs coefficient has popularly been calculated via production function; (4) Jobs matrix per economic sectors and jobs specialities is depending on the classification and jobs details depending on the statistical data collected.

There is a possibility of application of the BLS model for forecasting demand for HR with higher education qualification in Vietnam. However, because the BLS model could only provide the information on labour demand in general and the labour demand per economic sector only, thus it's necessary to further forecasting demand per qualification being treated as a basis for further defining the training demand. Therefore, the following steps are being proposed for performing the forecast for human resource with higher education qualification in Vietnam as follows: 1) Forecasting on labour force; 2) Forecasting based on the summary of economic information; 3) Forecasting jobs per speciality; 4) Forecasting job demand per qualification; 5) Demand on human resource with higher education qualification.

Having studied and analyzed the summary for those research conducted so far on the forecast demand for human resource, analyzed factors influencing the demand for the HR with higher education qualification as well as the international experiences, it's noticed that conditions for forecasting realization as well as the influencing factors are affecting on the selection of research method and altogether, will be directly affecting the forecasting result for demand on human resource with higher education qualification. The below scheme is built based on the above analysis and will be treated as theoretical framework basis for further study and analysis of the current situation as well as for a proposed solution.

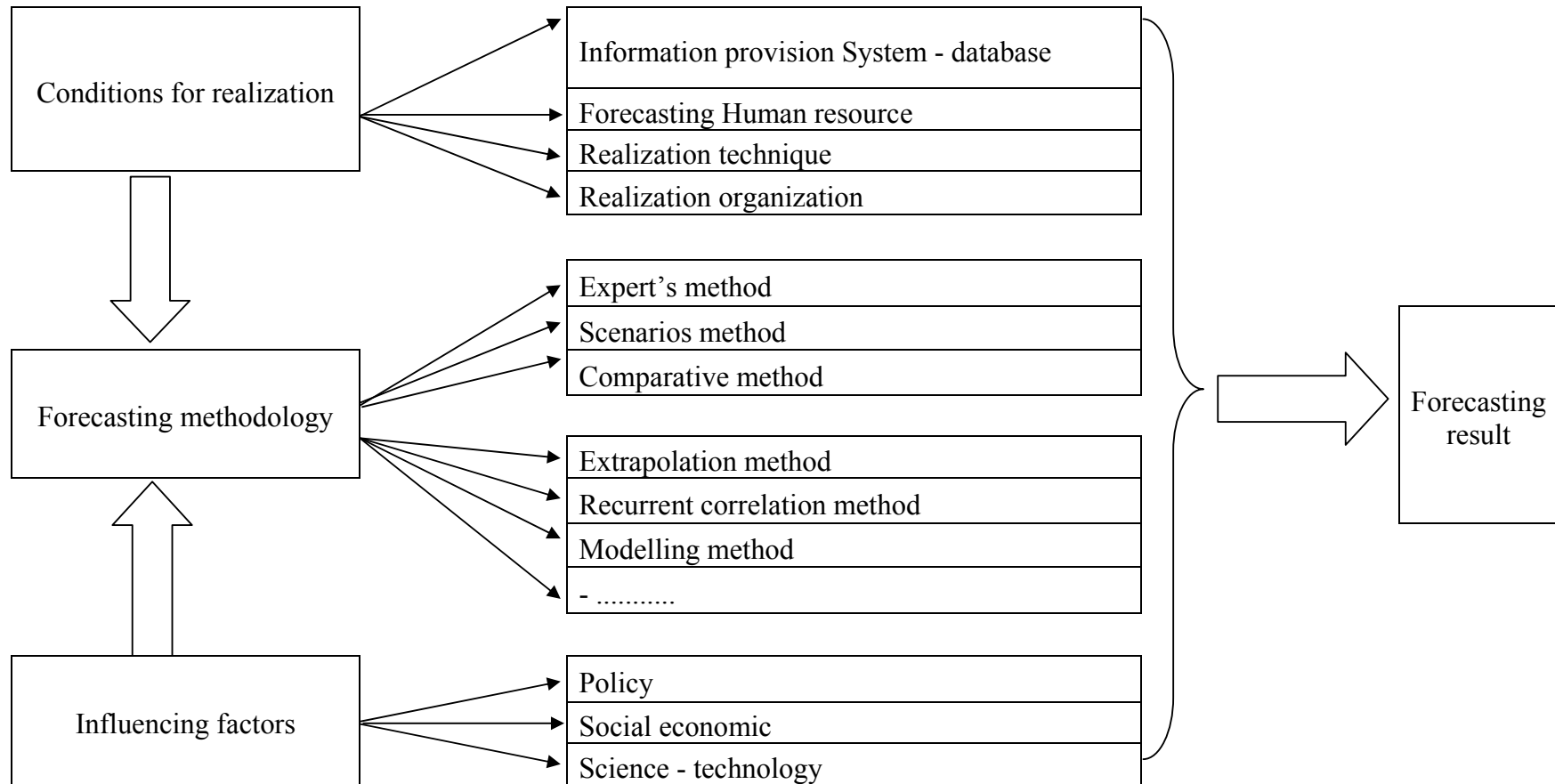


Diagram 1.1 Theoretical framework for research scientific basis of forecast demand for HR with colleges and higher education qualification

Chapter 1 Summary:

There are some definitions such as: Human resource, human resource demand and training demand, forecasting demand of human resource has been systemized in the thesis. Forecast demand for HR training is playing important role to the HR training management activities in particular as well as for the social economic management in general and this is especially at the process of planning, information provision and policy determination.

Demand on HR with higher education qualification has been influenced by different factors, in which there are 02 main groups of factors: i) Size, structure and development status of the economy as well as the total labor workforce; ii) Nature and the social economic development status. These factors are continuously affecting the demand, qualification structure, profession structure of the human resource with higher education qualification. Task for defining these relations is having important meaning in the process of analysis and forecasting for the HR demand nowadays.

Forecasting demand for HR with higher education qualification consisting of basic steps: Defining the subject to be forecasted, analysis of factors influencing the forecast and identifying key parameters, data acquisition and proposing different hypothesis for the forecasting, performing the forecasting, validating the forecasting result and implementing the forecasting results. Basic conditions for proper conducting the forecasting demand for HR with higher education qualification including: The leader's and management awareness of the role of forecasting demand for HR requirement on the data and information as well as the qualification/capability of the human resource doing the forecasting.

The US, UK, Swedish and other countries experiences in forecasting demand for HR has been generalized & summarized and some lessons have been made as for applying for the forecasting task for Vietnam.

Theoretical framework of the forecasting demand for HR with higher education qualification, especially factors affecting HR demand, stages of the forecasting process and relevant conditions needed for performing the forecast are being considered as basis for further current status analysis in the chapter 2 as well as the proposed solutions to the research listed in the chapter 3 of this thesis.

CHAPTER 2: CURRENT SITUATION OF THE FORECASTING DEMAND FOR HR WITH HIGHER EDUCATION QUALIFICATION IN VIETNAM

2.1. Outline on the human resource with higher education qualification in Vietnam

HR with colleges qualification or higher are those who is having a thorough grasp of profession knowledge both theoretical and practical and being able to work independently, organizational realization of important projects using the advanced science and technology. The goal of the higher education in Vietnam has therefore been defined in the higher education law (2012):

- ✓ Human resource training, improving intellectual standards, talents cultivation, research in science and technology as for producing knowledge, new products

...serving the requirement for social economic development, military & security warranty and international integration.

- ✓ Teaching people with political quality, morality, having knowledge and professional skills, capability of doing research and developing application in science and technology corresponding to the training qualification; having good health; ability to invention and profession responsibility, adaptability to the working environment and having aware of serving people.

2.1.1. Supplying source for the human resource with college and higher education qualification

Development of the higher education sizewise over the last years has been contributing into better population's demand on education needs, created more human resources for the social economic development, however, there is also some inadequate issue associated with the synchronization b/w the quantity increasing and the condition associated with as for keeping the quality. This is related to the fact that policy making process and the quality assurance for higher education has not been done closely over the time and this in turn might lead to the quality decreasing for the higher education.

2.1.2. Demand for human resource with college and higher education qualification in Vietnam, period 2007 - 2012

Since 2007, Vietnam is considered as entering into the phase with "golden population" having lots of young people ready for works. This is very important resource for our country successfully realizing social economic development strategy perios 2011-2020 and and this was certified by the Communist Party XI congress dated 16/2/2011. However, human resource quality of Vietnam is of rather low qualification and should be improved as soon as possible.

Current labour situation in Vietnam has shown imbalance. In the past, Vietnam is always observed as seriously lacking of capital but nowadays there is additional lacking of qualified human resource with relevant knowledge and skills. There are some investment projects possibly be stopped or delayed for preparation due to the inability of matching the requirement from the labour market.

Our country is owning very powerful workforce (more than 50 millions people within the labor age) but unfortunately without enough qualification. This leads to the urgent requirement for planning for human resource development meeting the requirement for social economic developmet when the country is widely be integrated into the globalization process. Number of the trained workforce has been increasing relatively fast over the last years and the percentage of workforce having colleges and higher education is 8.4% (survey report on labor jobs in 2012, Ministry of Plannning and Investment).

Structurewise per profession, the human resource with science and technology specialities is small compared with the remaining part for the social science such as law, economy, foreign language,.. Currently there is a lacking of engineers and skilled technical workers especially in those key specialities (such as mechanics, electronics, electrical engineering, chemical...) and at big industrial processing zones as well as the newly established economic zones.. Trained human resource structure per region is not rational yet and not yet matching with the specific condition for social economic

development of that particular region and so not being able to utilize the potentials and relative advantages effectively. Qualified human resource with colleges and higher education qualification usually having the preference living and staying in the big cities.

2.1.3. Structure of human resource with higher education qualification in Vietnam period 2007-2012

Our country human resource is structure moving to the direction of industrialization and modernization. According to the report on the situation of HR with higher education qualification issued in 2007, the highest rate among them are focused in the specialities: Education, processing industries and party organization, social administration, government administration; compulsory social insurance. The ones having lowest rate are the specialities: Hired labour service, mining industries, water and waste management. Actual data on the human resource with higher education qualification for several specialities mentioned in the general report on planning and development of human resource in Vietnam period 2011-2020 has shown: human resource with higher education qualification for all specialities are increasing and the highest rate is found in banking and IT sectors - those areas requires higher intellect. In the justice speciality, there is found the HR with higher education is predominant upto 82%. HR with higher education qualification is occupying 8.8% of the total workforce and having the average increasing rate upto 9.8% annually and mainly focused in the service sector (appr. 80%). Education & training occupies upto 30% total number of the HR with high education qualification countrywide.

Percentage human resource having higher education qualification is found extremely low in the processing machinery (5.61%), construction (5.74%), agro-forestry (0.64%), hotel and food (3.73%) and entertainment industries (9.67%). Lacking of qualified human resource is found in many specialities from the position such as consultant, design, human resource management, high ranking enterprise management, lawyer, environmental science, IT engineer, biotechnology, automation, materials technology...till social works. Human resource with higher education qualification is relatively distributed equal per 6 economic regions maintaining the rate of 6-8% of the total workforce per region. The 02 bigs cities - Hanoi and HCMC are the places concentrating the most of the human resource with higher education qualification and occupying appr. 20% of the total workforce of the cities and this is truly reflected the reality since these 02 cities are the key economical centers of the country.

2.2. Forecasts demand for human resource conducted so far

The forecasts which has been done so far could be listed: i) “Prognosis of demand prospect for specialized staff of Vietnam (1984) conducted by group of researchers headed by Dr. Do Van Chan, Higher Education & Technical Secondary School Research Institute; ii) Forecasting of Labor market conducted by the National center for forecasting & labor market information belonging to the Department of Employment (MOLISA); iii) Theme “Studying of model for forecasting demand for vocational training” conducted by the Vietnam Institute of Educational Sciences; iv) Scientific task at Ministry level “Forecasting the demand for HR training with higher education period 2011-2020” conducted in 2010 by the Center for Analysis and Forecasting Demand for HR training – the Vietnam Institute of Educational Sciences;

v) Planning for the Vietnam human resource development period 2011-2020 conducted by the cooperation b/w the Ministry of Planning and Investment and others Ministries.....

2.3. Real conditions for performing the forecast demand for human resource in Vietnam

Result presented in this part of the thesis is summarized from the result of survey and investigation of the report on feasibility study for the investment project "Setting up information system and forecasting the demand for human resources nationwide" conducted by the National Center for Information and Social Economic Forecasting of the Ministry of Planning and Investment. Researcher of this thesis has participated in the above study and so has asked for permission for using the result of that survey report, including additional processing the collected data as for achieving the goal of this thesis. The goal of this survey included: i) Study the experiences related to the forecast demand for human resource in Vietnam through the analysis of project documentation, research themes; ii) Review of the actual usage and study the information demand related to the forecast demand for human resource for serving the management and control function of the government, ministries and the local provinces; iii) Review current status of the information system and the databases serving the forecasting tasks on human resource demand, current status of the using forecasting methods for human resource at ministries, industries and provinces; iv) Review the readiness of the information data source serving the forecasting demand for the human resource; v) Review current status of the staff doing the analysis and forecasting demand for human resource.

2.3.1. Organizations awareness on the role of the human resource forecasting

The survey has shown that organizations and business units have agreed that there is a necessity of having reliable forecast demand for human resource, there is 85.4% of the total number of organizations have already started setting up proposal for planning on human resource development with outlook till 2020. 30% of total could be able to point out some concrete issues related to the demand for human resource which should be forecasted. Organizations at the ministry and region level have already somehow started the forecasting task but the way of doing has just covered purely what is under their management and the forecast is made with rather low reliability and the forecasting method is very manually done. There is 60% of the organization units mentioned the information on the forecast demand for human resource is for serving their implementation (Plan for human resource development of the region period 2011-2015 with outlook to 2020), there is indication on the forecast demand for labour per economic specialities, per the key strong area of the region, per unemployment rate...All organizations participating in the survey are interested in having information on the labour analysis market, on the shortterm difference b/w demand and supply. This kind of information would help governmental organization defining the strategy, the plan for production and trading, it would help the training institution having relevant solution and training policy for human resource, helping also common people utilizing the information for analysis and forecasting demand for human resource as for their orientation and profession selection.

2.3.2. System providing information and database

Information provision system: There is majority of norms for the survey on analysis and forecasting the demand for human resource has been supplied by the Department of Statistics; additionally there are another source coming from MOLISA, MOET, Ministry of Interior, Ministry of Industry & Trade,...as well as from provinces and regions.

Database: Currently there are some databases already available at the Department of Statistics, MOLISA, MOET, Ministry of Interior,... however, those database are not meeting the national needs for analysis and forecasting on demand for human resource yet, both from the information contents and technology aspects. There are 30% of the organization unit under survey replying they do have information provision system and the database available for serving the forecast, but there is high probability that those information provision systems are inadequate and having limitation

2.3.3. Technical conditions for realization

There is approximately 15% of the organizational units under survey stating that they would use model/method for forecasting demand for human resource at their organization (mainly using model: VANPRO,...). There are some information systems available at the MOET through the SREM project (Information system for educational management EMIS (educational statistics) and the Information system for Human resource management system PMIS) which have been implemented widely at 63 provinces. Additionally, there are another information systems such as: Establishing of system norm for evaluation of the educational management staff; newly establishing the information system for school management (SMIS), Financial management (FMIS) and inspection system (IMIS). At another ministries (for example MOLISA, Ministry of Planning and Investment,...)

It has been using some modern tools/models for forecasting labour demand. There is 60% of the organizational unit participating in the survey stating they have not been using any of other method for their forecast demand for human resource except using the statistical method and their own experiences during the process of establishing plan for forecasting demand for human resource for their region. Additionally, there are some provincial Interior dept. utilizing the human resource management software for their statistics, listing out and averaging estimation human resource information of their respective province. However, having asked for their comments on the reliability of the model/method used for forecasting on human resource then upto 60% of the units giving the answer as average, there is 30% saying the result is reliable enough. This reality has indicated that in parallel with the establishment of database stores being served for the forecasting on demand for human resource, there is a requirement for selecting relevant method/model for forecasting which should be modern enough but at the same time should be relevant to the real data condition of Vietnam, special attention should be paid to the training to the staff performing the forecasting who could be able to manage and further develop the forecasting model based on the argumentation basis selected.

2.3.4. Staff performing the forecast

Survey result has shown that there is a lacking of quantity and weakness in quality for staff performing forecasting in general including the ones for forecasting demand for human resource. Most of the organizational unit under survey has shown they have no operational unit dedicated to the human resource forecasting. The task for

forecasting demand for human resource and labor market would require the professionalism in the long run at both governmental and provincial level. For overcoming this there is a need for having longterm and professional training program and training on jobs is the most important. In particular, there is only 20% of the organization having operational unit performing the analysis and forecasting activities; there is only 28.5% among the total of the staff doing the forecasting were trained with this professional competency. At those organizations having dedicated forecasting unit most of them were trained in group of the Education & Training Bureau by the training program provided by the MOET. The remaining are of parttime jobs and majority of them are having higher education or even higher background.

General comments on the survey result:

- **On the forecast on demand for human resource doneby the Ministries and Industries:** All organization has already been establishing a report on planning for human resource development for the specialities under their control. In the orientation for human resource development, the ministries and industries have already pointed out the target related to human resource; there is an annual evaluation of the actual supplied to the theoretically forecasted and provision of report on the future demand for human resource.
- **Implementation procedure for forecasting demand for human resource at the Ministry and Industry level:** Almost all of the organization unit has not established the procedure framework for the forecasting task yet. There are units having proposed some group target, index for serving their human resource needs including: Form for info. collection for evaluating the current human resource and being splitted out by group of criteria, current status of the human resource of that particular industry. This is for briefly understanding the opinion on the human resource forecasting for each particular unit of the industry and for recognizing the fluctuation tendency in the near future.
- **Current situation of the information provision system and database serving the forecast demand for human resource at the ministry and industry:** Referring to the data collected by the survey that till now there is no any ministry or industry has invested in establishing complete information and database management system for serving the human resource forecasting needs. Organizational unit at the ministry and province level has already implemented the forecasting task but mainly focused on what they have managed with low reliability result and was done by the manual method. There is very poor information and database system which has not been paid much attention. There is a lacking of the staff dedicated to the forecasting jobs and they are knowledgeable weak as requested. Additionally, lacking of investment budget would eliminate the possibility of using the national electronic mailing system.

- **At the bureau belonging to the provinces/cities:** Organizations have been establishing report on the planning for human resource development for the areas under their management as for giving further advice to the region. In those orientation report on development of human resource, there is no quota related to the human resource indicated although they have been doing annual evaluation comparing the supplying with the actual as well as the planned human resource. Information on the forecast on demand for human resource, although limited, but has been used for planning tasks (from strategy to local development plan) as well as for the instructional and management task at the region. Information and database system serving the tasks for data acquisition, summation, achieving, processing and provisioning for forecasting demand of human resource is limited, not powerful enough and synchronized; Some organization could their specific information and database system for achieving and processing their own usage for serving their own planning task. However, this kind of system could only be served for their own organization and industry only. Those organization could not provide the argumentation basis or model for the human resource demand for their region; Most of the people doing forecast are parttime staff and have not been professionally and properly trained (not fully dedicated staff)

Indirect survey could help providing additional information for direct ones as for having full picture on the forecast the demand for human resource within the government organization from the ministry, industry and region as it's to note the needs for establishing solutions for human resource at the nationwide level.

2.4. General review on the forecasting demand for human resource with higher education qualification in Vietnam

Analysis and forecast the demand supply for human resource is important tool in the process of planning for HR development. The main purposes of this task is to create a science basis for the training orientation matching the society needs - this is ones of the longterm investment. Lacking of profession qualification would eliminate the economic development goal.

Reversely, highly concentrated training in some professions will lead to the over supply and wasting of resources. Having forecasting information on the lacking or over supplying would be of help for the labour policy makers and training management to adjust the profession structure as well as the human resource skills and this in turn would help to eliminate negative affect on the imbalancing b/w demand and supply as well as helping solving the increasing rate of unemployment.

In reality, human resource of the economic profession is being affected by lots of factors (been analyzed in chapter 1) such as fast technology development, consumers' products, industries structure, economic activities scaling, government program or policy changes...Therefore, evaluation of the labour market as for making the forecast closer to reality is very challenging to the researchers, labour policy planner as well as analyst on human resource and educational training planning.

Objectively evaluating the task for forecast the demand for human resource countrywide with the emphasis on the HR with higher education qualification has not been done adequately and scientifically enough. This is due to various reasons but the main and most important reason is that there is not available yet in Vietnam a countrywide information system and database on the national human resource and also the forecast on demand for human resource by different industries, levels and regions was not done properly as needed yet.

Chapter 2 conclusion:

In chapter 2, the thesis has generally presented the human resource with higher education qualification in Vietnam via: i) supplying source (training system for colleges and higher education); ii) Size of the resource with colleges and higher education; iii) Structure of the resource with colleges and higher education in Vietnam and this is being considered as the basis for forecasting the demand for human resource with higher education in Vietnam.

There are some forecasts and applications on the human resource demand which have been implemented in some research in Vietnam. This thesis has described different methods for forecasting mentioned in those research, especially the application of the forecasting method giving the result of: Plan for human resource development of Vietnam period 2011-2020 and Human resource plan of the Kontum province period 2011-2020. However, those forecasts are not giving the most reliable results since it has been performed in the unfavourable conditions such as lacking of data, lacking of knowledge for those performing the planning.

Having presented the survey data collected, this thesis has make analysis the current status of those conditions being needed for making the proper forecast commencing from the forecasting procedures, information and database system needed as well as the human resource performing the forecasting. Thus, the full picture of the human resource forecast in Vietnam is still having lots of discrepancies.

Based on the analysis and concrete study the subject matter, there are some conclusions made at the end of the chapter 2 on the demand for human resource with colleges and higher education qualification in Vietnam. Special attention has been paid to the current limitations which would be used as for proposing solutions to that limitations in the chapter 3.

CHAPTER 3: PROPOSAL ON PROCEDURES, TECHNIQUE AND SOLUTIONS TO STRENGTHEN CONDITIONS BEING NEEDED FOR FORECASTING THE DEMAND FOR HUMAN RESOURCE WITH COLLEGES AND HIGHER EDUCATION QUALIFICATION IN VIETNAM

Nowaday, forecasting is indispensable need for any social economic, science and technology activities and is subject of interest for study by all sciences. When establishing the forecasting model, it's necessary to refer to the result of fundamental research done on human resource forecasting and based on that foundation to establish a solution for application and implementation. It should not be randomly applied and implemented the forecasting those models in the practice without scientific basis which could be a wrong decision leading to the failure. In order to be able to establish a forecasting model which could be used in practice for forecasting demand for human

resource with colleges and higher education qualification it's necessary to have a comprehensive study on the scientific basis of the forecasting methodology.

3.1. Opinion and Orientation on the forecast on development of the human resource with colleges and higher education qualification in Vietnam.

Political report of the 8-th Party Central Committee at the IX plenum Party congress has stated: Education & training development should be considered as one of the important driving force for speeding up the development of the industrialization and modernization achievement goal, it's a condition for mobilizing the peoples capabilities and is the basic factor for social development, for fast and sustainable economic growing. XI plenum Party congress has confirmed "fast development of the human resource with the emphasis on the high qualified human resource is one of the three strategical breakthroughs as to make Vietnam becoming basically industrialized nation by the year 2020.

3.1.1. Opinions on the forecast development of the human resource with colleges and higher education qualification in Vietnam

a) Human resource is the most important source for fast and sustainable social economic development, it's decisive factor for all the success, therefore, forecasting the demand for human resource with colleges and higher education qualification should be inline with the social economic development strategy and should be matching with the government opinion on human resource development as well as meeting the requirement for global integration, contributing for realization of the century development goal for Vietnam.

b) Forecasting the demand for human resource with colleges and higher education qualification should be having longterm vision, step by step adaptable to each of the stage of the social economic development. The forecasting result should meet the requirement for providing information for the whole society and especially for those policy makers and the workers, minimizing possibility of lost due to mis-selecting the study which is leading to the unemployment.

c) Forecasting the demand for human resource with colleges and higher education qualification should meet the requirement on establishing the plan and strategy by the management to strengthen the government management functionality in development of the trained resource, mobilizing various investment resources for human resource development via procedures, attaracting policy, cooperation with partners both internal and external

3.1.2. Orientation for development of forecasting human resource with colleges and higher education in Vietnam

a) Forecasting human resource with colleges and higher education qualification is one of the basis for establishing strategy for the national human resource development, this has more meaning in the establishing the strategy for social economic development.

b) Human resource with colleges and higher education qualification should meet the requirement in the overall requirement for the human resource for the society.

c) Human resource with colleges and higher education qualification should be in line with the planning for the network of the colleges and universities and meeting the HR requirement of the regions, ministries and industries.

d) Human resource forecasting should be done in details for each ministry/industry/region in order to create a legal framework for making policies, especially those ones related to the training management.

e) Human resource with colleges and higher education qualification should be forecasted in relevant correlation with the profession structure, making sure the needed quantity and quality requested by the society; human resource development with focus and paying attention to develop the high qualification resources in science and technology (experts, leader in the respective field); best satisfying the requirement for human resource as per the master planning for social economic development.

g) Forecaters' capability improvement as for being able to analyze the current situation and capable of evaluating the future;

e) Improving the shortterm and longterm forecasting model matching with the Vietnam condition.

g) Improving the information system for labour market, establishing national database for the labour market meeting the requirement for analysis and forecasting.

3.1.3. Proposed forecasting models on demand for human resources to be used in Vietnam

Through the research and studying various forecasting methods which has been used/recommended to be used in the future in Vietnam, this thesis briefly summarize various models/methodologies for HR forecasting.

Model and methodology on the forecast demand for human resource proposed by this project is having target for: i) medium and longterm forecasting the demand for human resource of the country and for 06 economic regions; ii) medium and longterm forecasting demand for human resource for the regions; iii) Shortterm forecasting the demand for human resource and warning on the requirement on the adjusted human resource per the jobs tendency nationwide and for 06 regions. Forecasting models proposed including: model with the inter-profession, inter-region approach and the Forecasting model based on the macro-micro economic approach.

3.2. Proposal on the process, technique for the forecasting demand of human resource with colleges and higher education

The process for the Forecasting demand for human resource with colleges and higher education is similar to anther forecasts with other qualification and it's part of the process for forecasting for the resource for the whole economy but with different qualification. The following proposal already taken into consideration process, technique and necessary validation from the forecast in general into this specific forecast the demand for human resource with colleges and higher education.

3.2.1. Process of the forecasting demand of human resource with colleges and higher education

For establishing one forecast, the following steps must be processed: Step1: Selecting forecasted subject, forecast timing period → Step 2: Analysis of factors affecting the demand for human resource with colleges and higher education qualification, selecting parameters for entering the model → Step 3: Collecting necessary data needed for serving the forecast → Step 4: Other data related to the forecast → Step 5: Selecting variables and forecasting equations, validating the correctness of the forecast → Step 6: Forecasting model evaluation → Step 7:

Presentation of the forecasting result → Step 8: Validating the forecasting result.

3.2.2. Performing compulsory validation for the forecasting equation

Corresponding to each factor affecting on the forecasting subject and after running the model, there is a possibility to find out the dạng của phương trình DB. However, with the allowable probability margin of mistake it's necessary to determine whether the model is relevant or not? For confirming this it's necessary to perform the model's validation, regression coefficient estimation with the allowable reliability.

3.2.2.1. Validation of the multiple correlation coefficient

3.2.2.2. Validating Autocorrelation

3.2.2.3. Validating the heteroscedasticity (PSSS):

3.2.2.4. Validating of multicollinearity

3.2.2.5. Validating forecast accuracy

3.3. Implementing the forecast demand on HR with colleges and higher education qualification

With the data collected on population, GDP, HR with colleges and higher education qualification from 1999 till 2011, the trial is made to select the relevant forecasting equation as per the mathematic functions following by the checking for relevancy of those functions.

3.3.1. Forecast model finding for HR with colleges and higher education qualification

3.3.1.1. Timeflow Forecasting Model

3.3.1.2. Forecasting Model by Labour Ratio

3.3.1.3. Finding the forecasting function in correlation with GDP

3.3.2. Comparison and general evaluation of the forecasting result HR with colleges and higher education qualification

Table 3. 1. Forecast HR with Colleges & Higher Education qualification till 2020

Year	Total Colleges, Higher Education	Grow rate	Percentage
2011	3.470.690	6,27	6,91
2012	3.703.030	6,69	7,20
2013	3.974.900	7,34	7,54
2014	4.302.470	8,24	7,98
2015	4.700.461	9,25	8,52
2016	5.161.580	9,81	9,15
2017	5.706.643	10,56	9,90
2018	6.352.061	11,31	10,79
2019	7.118.112	12,06	11,84
2020	8.029.930	12,81	13,08

Each of the forecasting equation processed by different factors will provide with different results. Expert method will help analyzing, reviewing the result as for the forecaster to select the most reliable solution. Which result to be selected is the forecaster choice thus it would require that the forecaster should be well understood

the forecasting subject, its past and future development. Orientation of the policy and social economic development would also be contributing into the final selection.

3.4. Solutions for strengthen conditions for realization forecast the demand for human resource with colleges and higher education qualification

3.4.1. Solution for policy on development of human resource and labor market

Goal: It's a necessity of having system of relevant policies as a base for having good conditions for realization of the forecast: (i) support in issuing policy on human resource development, especially those related to education and training, labour and jobs,...(ii) minimizing the difference b/w the labour demand and supply per speciality and training area of the economy and per each economic sector; effectively contributing to the development and distribution the human resources.

Contents: Improving the system of policies for labour market with the attention on the development of the human resource, especially the qualified ones; establishing information network for management human resource incl: information system on education, training, labor market; setting up the mechanism for sharing and combining the info. and this is acting as a base for supporting the best forecasting task. Having proposed list of items to be covered by the National target program for jobs as per the stages (approved by the National Assembly) and this is used as basis for defining and establishing training plan for human resource in general and particularly for the resource with colleges and higher education qualification meeting the social needs.

Realization conditions: Related ministries/industries especially the MOLISA and MOET should be coordinating further with other ministries for revising, adding or creating new legislative documents and norms related to the labour market in general and the ones with qualification and this is to be used as a basis for orientation development of the trained labor market.

3.4.2. Solution for capability improvement for the forecaster

Goal: reality survey has shown majority of the staff doing forecasting is having university degree and above. However, they are not well trained yet on the forecasting profession and they have no experiences in performing the forecasting task. The solution here is there should be a target to be set so that the staff carrying the task should be capable.

Contents: Building up staff having capability in handling the information and forecasting task for ministries and industries. Improving the forecasters' skills through training courses both shortterm and longterm locally or overseas. At the same time coordinating with organization and international experts to perform analysis and establish forecasting model for human resource suitable for Vietnam conditions and special emphasis is made to the model for the qualified human resource. The current forecasting model in use in Vietnam is rather complicated in manipulation and there are not so many local experts are knowledgeable enough to handle the model leading to the needs of hiring foreign experts using and making knowledge transfer. This leads to the high running cost. Organizations in Vietnam dealing with the forecast are still

lacking of experiences both theoretical and practical. Real experiences over the last years has shown that this research area is still facing lots of difficulties in regard of staff and financing. It's therefore suggested that there should be more attention being paid by statistical, social economic forecasting organizations as well as the taking care of by the government leader and managers at different levels.

Realization conditions: It should be organizing an annual and specialized forum on forecasting and social economical statistics topics in Vietnam. This forum will be used for exchanging experiences, academic knowledges and info. on the statistics and forecasting topics. Through this forum, organizations' managers would be discussing further on the mechanism of mutual coordination and data sharing ,.. (currently each of the organizations might have their own database taken from different funding and there is no such of sharing the info. and data thus leading to social resource wasting)

3.4.3. Supporting solution for finance for serving forecasting

Goal: Regardless of forecasting method to be used, for performing the forecasting there is always a need for a chain of the past data as well as the current data and some related forecasts. There are so many requested data but not always the needed are available or meeting the requirement. It's therefore requested to conduct survey for info. acquisition. Beside that there is a need for providing training for the forecasters which all require not a small funding.

Contents: establishing proper financing system needed for data collection activities, processing and summarizing collected data. Financing distribution mechanism should be done properly as for keeping the forecasting task done continuously and regularly. Setting up the expenses norm for each of the activities. Forming financing norm for supporting forecaster participating in overseas training in those countries having lot of experiences in doing the forecast and those staff will becoming a core staff for future activities.

Realization conditions: Ministry of Finance should be coordinating with related ministries and industries establishing documentation on the finance norms and setup up plan for relevant distribution of fund as for making sure the forecasting for the human resource with colleges and higher education qualification is being done properly and continuously and this is will be a basis for policy defining and establishing plan of the management.

3.4.4. Solution for organizational realization of the forecast

Goal: Awareness the importancy of the forecast in defining the development policy for social economic development, some forecasting organizations have been established for serving the forecasting need for the whole country economy or each of any particular industries/specialities. Currently there are the national information and forecasting center for social economic development (Ministry of Planning & Investment), the national center for forecasting and information on labour market (MOLISA) and the center for analysis and forecasting the demand for human resources (MOET). These 03 centers have started coordination and sharing the experiences on forecast performing. Improving the forecast for labour market per

qualification and training specialities. It's suggested to have further and better coordination and experiments sharing with other research units on forecasting from different universities and research institutions.

Contents:

- There are 03 highly specialized centers at the national level for forecasting, the name of those have been listed above. Those 03 national and highly specialized centers should be strengthen with more investment to be made both in term of the human resources and the infrastructure as for being able to meet many new goals set;

- The core unit is located at the Central and being acted as the center for the whole system which has responsibility for data collection and establishing information system for human resource demand countrywide based on the info. provided by other remote centers. This core unit will be making forecast for demand on human resource at the level nationwide, ministries, industries, per each economic component, region and being maintained and closely cooperating with other units for supporting them with the the info. on how to set up the information system. All the required conditions for maintaining proper operation of the core unit such as infrastructure, staff, finance,... should be provided properly and timely.

- Network of satellite units at different ministries, industries and regions should be responsible for acquisition, summary and data input into the database available at the core unit mentionen above by means of using area network. The satellite units are being responsible for doing the forecast for human resources at their ministries, industries or region level under its responsibility based on the source of information data of the whole system.

Realization conditions:

- Authorizing the jobs introduction center to perform the forecasting labor market as for define the strategy as well as the social economic development of the region.

- There is a need for having connection b/w the organization performing the forecast with the statistics department for providing micro economic data per various areas such as economy, society, investment ... during the process of making analysis and forecast;

- Increasing international cooperation, expanding mutual and multiple relations at the government level which would allow Vietnam learning about other countries forecasting models as well as learning forecasting experience.

3.4.5. Solution for improving the regularly collected information and data acquisition

Goal: Difficulty in getting system data is the biggest challenge for forecasting since the previous data collection was not properly done. Our data is having the followings disadvantages: 1) Not fully enough; mismatching, some parameters are having no data as it has never been collected; or some parameters are having data collected in one year but no more available in the next years and via versa; 2) rather low data reliability since there is big difference b/w statistical data coming from different data sources. This disadvantage of the statistical data should be corrected by dedicated statistical organization.

Contents: public survey for statistical purposes has been continuously been added and improved but still could not meet the requirement for forecasting. For conducting a class of additional forecast for human resource demand being trained as per the model proposed, there is the need for information, statistical data from one or two following surveys:

a) “Trace survey”: surveying the info. on the student participating into the workforce, job, incomes, feedback on the corresponding level of the trained program or knowledge or skill of the newly finished the school and participating into the workforces; Additionally there is an additional direction to evaluate the training efficiency, providing useful info. for the learner and the teaching institution and structure adjusting for the teaching specialities for the whole system.

b) “Recall Survey”: This survey will be questioning the workers the info. related to the profession (position), income, qualification and trained profession.

It could be seen that the data system for labor demand supply and unemployment in different industries of the economy is being categorized per profession, training specialities,...This data is changed yearly and that is not only depending on the demand for social economic development but also depending on the signaling about the change of the labor and jobs market. For utilizing this data system for serving the forecasting on human resource needs, it’s necessary to adjust the forecast in the direction for coping with the shortterm forecasting and there is a need for conducting additional surveys. It’s necessary to be step by step finalizing this data information system and it’s database. It’s necessary to study basic indexes on resource development and creativity as for having a basis for evaluating the the resource development in Vietnam and by doing so to contribute establishing the training program more reasonably and effectively. Studying statistical indexes and start collecting the data needed for the forecast.

The biggest difficulty for successfully implementing forecasting methods for human resource demands is mainly due to the data. This would be affecting the selection of the medium and longterm forecasting models for the human resource forecasting at the ministry, economic area, region. Available data for forecasting in Vietnam is usually of accumulated type and as per the forecasting experiences made in another countries, the data being suitable for forecast purposes should be the ones extracted directly from mico survey as for making it more consistency. It’s therefore suggested that the survey on job & labour should be done annually. Furthermore, worker qualification should further be classified in more details and it must be classified by training speciality but not limited to just the skill qualification as till now. The qualification classification must be unified between demand and supply. It’s therefore necessary to setup a datawarehouse or multiple database as for serving the forecasting needs. Having this centralized database system would effectively and economically serving the forecasting needs for all levels nationwide, ministry, industry and region.

Existing database currently available at the ministries, industries and regions could still further be developed independently and being connected to the above mentioned datawarehouse and the main database available at the core center and this is to form a complete database system for forecasting.

Chapter 3 conclusion:

Clearly understanding the government opinion and orientation on the forecasting for the demand for human resource with colleges and higher education qualification is the fundamental for any forecasting activities related. The thesis has proposed the procedure for forecasting the demand for human resource with colleges and higher education qualification consisting of 8 steps: i) selecting forecasted subject, forecast timing period; ii) analysis of factors affecting the demand for human resource with colleges and higher education qualification, selecting parameters for entering the model; iii) collecting necessary data needed for serving the forecast; iv) other data related to the forecast; v) selecting variables and forecasting equations, validating the correctness of the forecast; vi) forecasting model evaluation; vii) Presentation of the forecasting result; viii) validating the forecasting result. There are some compulsory validation being conducted for the forecasting equation presented, including: i) validating the multiple correlation factor; ii) validating autocorrelation; iii) validating heteroscedasticity (PSSS); iv) Validating multicollinearity; v) validating the forecasting accuracy.

Those important validation is being considered as important part as for making assessment on whether the forecasting model is relevant or not within the scope of data. Conditions associated with the forecasting including: data, funding and techniques conditions. The thesis has also tried several forecasting equation with the real Vietnamese data such as population, GDP and the human resource with colleges and higher education qualification and most relevant result matching with Vietnam condition has been selected. It has been proposed with some solutions for improving the forecasting efficiency for the forecasting the demand for human resource with colleges and higher education qualification, including: i) macro policy solution; ii) solution for capability improving for the forecasters; iii) financial supporting solution; iv) solution on the organizational realization; v) solution on finalizing the information and data collection system on regular basis.

CONCLUSION AND RECOMMENDATION:

1. Conclusion

Forecast the demand for human resource with colleges and higher education qualification is important part of the educational management science. Demand and supply forecasting is indispensable and difficult task of the resource planning. Planning establishment is the bridge between nowadays and the future and it would help increasing the expected result. This is also the fundamental for effective defining the strategy. By establishing the strategy and planning the management is having a base for organizing necessary activities inside the organization.

Government opinion and orientation on the forecast the demand for human resource with colleges and higher education qualification is the guideline for all forecasting activities. The forecast is having important role in the resource training and in social economic management, especially at the planning phase and do providing info. and policy setting. Human resource with colleges and higher education qualification has been influenced by 02 groups of factors: i) size, structure and the development of the economy and the total workforce; ii) nature and level of science

and technology development. Those factors continuously affecting on the demand as well as on the qualification structure as well as the profession structure of those qualified human resource.

Forecast the demand for human resource with colleges and higher education qualification is including the basic phases: Defining the subject to be forecasted; analyzing affecting parameter and identifying key variables, data collection and proposing assumptions for the forecast, performing the forecast, validating the forecast result and implementing it.

Reality with conditions supporting the forecast on demand for human resource commencing commencing from the process of forecasting, information system and database serving the forecast including the staff doing the forecasting has shown an overall inadequate picture of the forecasting activities. The data provided to the forecast is indispensable component for the forecast and so it must be reliable and consistent. Reality observation has shown that there is a lacking of the current forecasting task with very weak activities: lacking of the information and database system, has not been updated regularly or completely or the data set is not long enough for as for quantitative forecasting, conditions for performing the forecast is lacking and the staff doing the forecast has not been trained properly since most of them are not dedicated but rather a parttime jobs assignment.

Thesis has made the research and proposed the process of forecasting the demand for colleges and higher education qualification consisting of 8 steps and presented some requirement on compulsory validation for the forecasting equation. This validation is important part for evaluating the matching and correlation of the forecasting model within the framework of the sampling data collected. Conditions required for realization of the forecast the demand in Vietnam could be listed out as: data condition; conditions related to the budget and technique for realization,... Thesis has tried some forecasting equations and the validations necessary for getting reliable result and based on that to propose some solutions for strengthen conditions for maintaining the forecasting quality. However, due to some weakness in collecting data and the limitation in manipulating the models thus the forecasting could not be completely perfect. Some solutions have been proposed for for improving the efficiency of the forecast task incl: i) solution related to macro policy; ii) solution related to the quality improvement of the forecasting staff; iii) solution on the financial support; iv) solution on the organizational realization; v) solution on improvement of the information and data acquisition system being updated on regular basis. These are the proposed solutions for quality improvement for the forecasting activities for demand for colleges and higher education qualification in Vietnam.

2. Recommendation

Because of the limitation, pending issues in researching the demand for human resource in general and the demand for human resource with colleges and higher education qualification in particular and in order to meet urgent requirement for making breakthrough in improving the forecasting the demand for human resource, the following are proposed by this thesis:

Renovation of the information and achieving system: It's necessary to have investment and renovation for the educational and social economic information

system. Information should be collected on the wide basis and being updated annually. Practically, lacking of the educational and social economic information the forecasting could not be done properly as needed and even with sufficient info. but the data of low reliability then the forecasting result would be of low quality, not relevant and the result is not reliable enough.

Organization and coordination for the forecast realization: Finalizing coordinating mechanism in realization the forecast including information collection, sharing the input information as well as utilizing the result outputting by the forecasting activities;

Improving capabilities for the forecasters: improving quality, cultivating the ability of the forecasters; increasing the investment and establishing financial procedures for the analysis and forecasting activities; expanding the international cooperation for the forecasting job.

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