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Labor market and demographic scenarios for ASEAN countries (2010-35) Education, skill development, manpower needs, migration flows and economic growth

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Executive summary

ASEAN countries have been moving at different speeds along the path of the so called Demographic transition and are at present at different stages of this complex process. As a consequence, starting in the very near future, some ASEAN countries will be affected by an increasing structural lack of labor supply, while in other a structural excess of labor supply will persist for at least 30-40 years. This situation has already contributed to divide ASEAN countries into two groups: departure countries and arrival countries. Data show that both departures and arrivals have been steadily increasing as well as labor mobility within ASEAN.

Building on this demographic background, the paper proposes alternative labor market and demographic scenarios for the period 2010-35. The scenarios outline manpower needs, migration flows and population growth on the basis of the trends in WAP and alternative hypothesis on employment growth. The main conclusion is that the higher the rate of economic growth that will be attained by Singapore, Thailand, Malaysia, and Brunei (already relevant arrival countries), the higher their need of foreign labor. In fact, in a very near future the local labor supply of these countries will not be even sufficient to replace the workers that will leave for good the labor force due to retirement or death. In substance, the paper supports the idea that growing workers mobility within ASEAN countries will represent an unavoidable precondition for economic growth and social development.

A survey of economic growth model brings us to support the idea that economic growth is the result of a process of technological upgrading, of diversification and structural change driven by the accumulation of capabilities, on one hand, and the transformation of the production structure, on the other. It is the knowledge base of a country that defines and limits the technologies a country can adopt, the production structure that may evolve, and therefore the possible paths to economic growth and social development. Speeding up economic growth and triggering successful catching up processes does require shifting production from low quality activities into "high quality activities", to "jump" into new knowledge clusters. In order to do so a country also needs to drive the knowledge structure toward higher diversity and complexity, to endow its incoming labor force with new expertise and competences.

The different levels of economic development reached by ASEAN countries have been fostered and reflect their different knowledge base. The percentage of people between 15-44 with secondary and tertiary education spans between the maximum of Singapore (91 per cent) and the minimum values that characterize Laos, Cambodia, and Vietnam (between 40 and 45 per cent). A more detailed analysis of the national educational attainments shows that beside Singapore -that has the world highest ranking in Industrial performance- only Malaysia and Indonesia have already shifted their production structure to high quality activities and new knowledge cluster or are ready to do so. The more polarized education structure of Thailand and possibly Myanmar suggest that these two countries have limited options to

start the production of intermediate technology products, but could develop directly toward high technology sectors.

In conclusion, the paper contends that in a very near future workers mobility within the ASEAN region will not be a choice, but a necessity imposed by demographic tendencies and economic growth. The pace of economic growth and the typology of development will determine the amount of labor force that will be needed and the competencies and skills that will be required by arrival countries. At the same time, the other ASEAN countries will be characterized by a structural excess of labor supply that will not be able to find a productive occupation in the national markets, since the rate of economic growth requested to absorb it will remain out of reach.

It could be ASEAN goal to transform these weaknesses into strong points.

The structural lack of labor supply that will affect Singapore, Thailand and, although in a lesser measure, Malaysia can be faced only in two ways: migration and delocalization of production. The second approach, although viable from an economic perspective, can provide only a very partial solution to the expansion of production, given its risks and serious political drawbacks.

In this situation the papers proposes a series of policy options.

In the first place, a correct migration policy can be based only upon a serious evaluation of the amount and typology of workers needed by arrival countries. The paper stresses the fact that the more developed economies do not need only skilled labor, but on the contrary -especially at the beginning of the migration process- they need mainly unskilled labor and only with time qualified workers and university graduates will become predominant.

The other side of the coin is that the outflow of migrants presents both positive and negative aspects for departure countries. On one hand, it reduces the pressure on the labor market and provides remittances that could support productive investments. On the other hand, it depletes the knowledge structure and the capabilities of the departure countries because migrants are always, by definition, the most dynamic element of their societies.

A correct approach to economic growth and catching up suggests that educational policies and industrial policies can play a fundamental role. In order to do so educational policies must be designed and implemented in relations to the training needs of both departures and arrival countries, while industrial policies should provide a production structure capable of promoting economic growth and a labor demand coherent with the exits from the educational system.

More specifically, at national level, education and training policies should: 1) in the short run, provide a correct response to the local labor demand in terms of skills; 2) in the long run, endow the incoming generations with the knowledge and the skills necessary to move the national production structure toward higher quality products. Moreover, the

educational policies of the departures countries should be coordinated also with the industrial policies of the arrival countries so that the structural excess of labor supply of departures countries will find productive employment or in the arrival countries or in their investment in departures countries.

In order to face such complex set of task, ASEAN countries will need, as already clearly suggested by the last ALM Working Program, a Labor Market Information System providing comparable information on the main aspects of human resources management, from demography to education and vocational training, from macroeconomic to employment, unemployment and migration, together with a broad comparative view of their labor market legislation.

Therefore, an extremely important objective of ASEAN could be the constitution of an **ASEAN Labor Market Information System** aimed to collects, store and analyze the data produced at the national level, better their quality, and promote their comparability.

The paper proposes a second important measure that responds not only to principles of equity and competitiveness but could also foster economic growth and social development: the creation of an **Employment Migration Fund**.

A migrant brings with him a set of capabilities that are the result not only of its personal investment, but also of the investment in education made by its country of origin. In substance, the arrival of a migrant corresponds for the production system of the receiving country to the free acquisition of a factor of production. This is obviously true only if and when the migrant worker is needed, i.e. his services are essential and do not have a substitute in the arrival country. The paper has strongly argued that this situation will exist and persist for at last four ASEAN countries and will affect a number of workers largely in excess of those "forecasted" by international Institutions.

This aspect of migration has been largely overlooked by the literature because migrations are still predominantly explained from the supply side, migrants being represented as people running away from misery and deprivation or just looking for higher wages and a better life. This perspective has brought to the proposal, almost 40 years ago, of the so-called Bhagwati tax.

If we abandon this point of view and more in tune with reality and empirical evidence we realize that many developed economies that have been affected already for long time by below replacement fertility do not have enough internally "produced" labor not only to expand, but even to keep the present level of production, then we have also to change our image of the migrants.

The first obvious implication is that the arrival country should pay to the departure country for each migrant employed in a productive job a price proportional to the cost supported by the government of the country of origin for its education and training.

The proposal is that these contributions be collected in an **Education Migration Fund** managed by ASEAN to be used only to improve the

education and training system of member countries by intervening on the infrastructures, training the teachers, providing equal opportunities, and promoting gender equality, in coordination with the industrial and macroeconomic policies required to start effective catching up processes.

This measure would not only respond to a principle of equity, eliminate market distortions deriving from the free acquisition of factors of production by arrival countries, but in the growth perspective we have introduced, it would also be beneficial to arrival countries by fostering the process of catching up of the weaker economies, increasing their level of income and therefore expanding the market for the products coming from the more developed neighbors.

JEL Classification: F22, I25, J11, J24, 053

Keywords: ASEAN; Labor market; Demography; Scenarios; Migration; Education; Growth

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We shall work closely with workers, employers, civil society, and other organizations to provide a favorable environment for economic growth and employment creation, as a key strategy to accelerate economic recovery and growth.

We shall give priority to capacity-building in order to develop a productive, competent, and competitive workforce. This will enable the people of ASEAN to meet the changing job demands and challenges in the face of the integration of regional and global labor markets.

ASEAN Labor Ministers' Vision Statement, 2000

1 INTRODUCTION [1]

1.1 The Institutional background

ASEAN countries are committed to "enhance and improve the capacity of ASEAN human resources through strategic programs, and to develop a qualified competent and well-prepared ASEAN labor force that would benefit from as well as cope with the challenges of regional integration"[2].

Since 2000, ASEAN's activities on labor and human resources have been guided by ASEAN Labor Ministers (ALM) Work Programs. The first Work Program set five broad priorities in the areas of employment generation, labor market monitoring, labor mobility, social protection, and tripartite cooperation. In the ALM Joint Statement of 2006 a sixth priority area, namely occupational safety and health (OSH), was added to in the Work Program. Since then new areas of work have emerged, including protection and promotion of the rights of migrant workers, HIV prevention and control in the work place, employment and labor law, as expressed in the ASEAN community blueprints.

A *Ad-hoc Working Group on Progressive Labor Practices to Enhance the Competitiveness of ASEAN* was established in 2006. In 2009, the ASEAN leaders adopted the Cha Am Hua Hin Declaration on Strengthening Cooperation on Education to Achieve a Caring and Sharing Community. The 17th ASEAN summit, held in Hanoi in 2010, focused on skills development and life-long learning. In that occasion the Leaders of ASEAN adopted a *Joint Statement on Human resources and Skills Development for Economic Recovery and Growth*.

The Joint Statement affirmed that: "HR development should be an integral part of a country's development strategy", the rational being that "Human resources development correlates with productivity and higher productivity leads to higher economic growth." It suggested that in the

[1] The paper has been written in the context of the project STVET (Strengthening Technical Vocational Education and Training) of the Ministry of Labor and Vocational Training (MOLVT) financed by the Asian Development Bank (ADB Grant Number: 0178-CAM) in which the author acted as Labor Market Information and Statistic Specialist. The views and opinions expressed in the paper are strictly those of the author.

[2] ASEAN Socio-Cultural Community Blueprint.

medium-and long-term regional countries should take measures, among others, to upgrade the quality of the workforce through improving the relevance and quality of education and training. It further suggested that the gradual shift from an export-oriented economy to a more internal consumption base economy that many ASEAN countries will experience will need a greater capacity to rapidly intervene in the development of HR. Finally it reminded that the social dialogue between employers and employees should be strengthened to better the matching between the skill needed by the employers and the training provided to the workers. The document concluded stating that the " ... globalization, technological development and demographic change have added a sense of urgency to improving quality of HR as they change the workplace, the nature and organization of work."

According to the last ALM Work Program covering the period 2010-2015: " The overall objective of ASEAN cooperation on labor is to build towards the vision of a better quality of life, productive employment, and adequate social protection for ASEAN peoples through enhancing workforce competitiveness, creating a harmonious and progressive workplace, and promotion of decent work for all." The work plan indicates four strategic priorities: i) Legal foundation; ii) Institutional capacity; iii) Social partners; iv) Labor market and workforce development.

The first priority implies the protection of labor right and conditions, including those of migrant workers; the second the capacity of the Government bodies to oversee the enforcement of labor laws and regulation; the third the establishment of informed social dialogue among labor sector partners at the national and regional level. The fourth priority includes a set of goals that will be at the center of the present paper:

1. Creating systems that will promote the mobility of skilled labor within ASEAN;
2. Anticipating, analyzing, monitoring and communicating to labor sector stakeholders and the public the impact of trade liberalization and of other global economic challenges on employment, wages, working condition, skills demand, etc.;
3. Promoting progressive labor practices with regard to workforce development, skills training and standards, labor productivity, and labor law in order to enhance the competitiveness of firms and workforces, and thus of the ASEAN Member States and the region overall;
4. Generating, regularly updating, and effectively disseminating labor market information.

1.2 The structure of the paper

The paper is structured in four parts. The first part analyses the impact of the Demographic transition (that we will prefer to call Demographic revolution) on the demographic tendencies and indicators of ASEAN countries. It will document the fact that the members of ASEAN have proceeded at different speeds along the path of the Demographic revolution

and have reached different stages of this complex process. As a consequence, while some countries are already (or will be soon) characterized by a declining Working Age Population (WAP), in other WAP will continue to grow. This will create a structural lack of labor supply in some countries and an excess of labor supply in the others.

In the second part of the paper a model is introduced that allows estimating manpower needs, migration flows, and population trends as a function of the evolution in WAP and alternative hypothesis on employment growth. The model is used to build alternative labor market and demographic scenarios for ASEAN arrival countries. The exercise clearly shows that the future economic growth of Singapore, Thailand, and Malaysia will hinge on the arrival of very relevant numbers of foreign workers. The results are discussed on the basis of the tendencies exhibited in previous periods by migration flows in the Asian continent and more specifically in ASEAN countries and of a critical appraisal of the projections made by the United Nations Population Division.

The third part of the paper discusses alternative growth theories and their implications in terms of industrial and educational policies. It will be shown that according to the New evolutionary economics, growth is lead by the accumulation of capabilities that allows, in a first phase, to diversify production inside a given knowledge cluster, and then to jump to new knowledge clusters, i.e. to move to higher quality products.

The fourth part of the paper reviews the educational attainments of ASEAN countries. It then discusses the relationship between their education structure and the stage of growth they have reached and outlines their present options for technology and product diversification.

The conclusion will bring together the main results reached in the four parts of the paper and spell out a series of policy suggestions.

2 THE DEMOGRAPHIC BACKGROUND

In 1950 the total population of ASEAN countries amounted to around 172 million; after 60 years it reached almost 593 million and by now it should have passed the 600 million mark[3]. The average growth of 7 million per year registered in this long time interval is the result of 11 million births, 4 million deaths, and of around 150,000 net migrants per year (Table 1).

[3] Percentage rates of growth above the regional average (243.7 per cent) have been registered by the four smallest countries (Brunei, Singapore, Laos and Malaysia), together with Philippines, that register an astonishing demographic growth of 407%. As a consequence, Philippines are now the second most populous country in ASEAN after Indonesia that remains the most populous one with 240 million inhabitants, but ahead of Vietnam and Thailand.

Table 1 - ASEAN countries; population, births, deaths and migration balance; absolute values; 1950 - 2010

	Population 1950	Birth	Death	Natural Balance	Migration balance	Total balance	Population 2010
Brunei	47	345	35	310	496	806	853
Cambodia	4,346	18,650	8,055	10,595	-803	9,792	14,138
Indonesia	74,838	271,095	101,475	169,620	-4,590	165,030	239,868
Laos	1,683	7,910	2,850	5,060	-540	4,520	6,203
Malaysia	6,112	26,105	5,670	20,435	1,855	22,290	28,402
Myanmar	17,156	58,600	25,970	32,630	-1,810	30,820	47,976
Philippines	18,395	102,395	22,400	79,995	-5,135	74,860	93,255
Singapore	1,025	3,010	815	2,195	1,865	4,060	5,085
Thailand	20,608	67,210	21,340	45,870	2,615	48,485	69,093
Vietnam	28,263	101,205	38,440	62,765	-3,170	59,595	87,858
Total	172,473	656,525	227,050	429,475	-9,218	420,258	592,731
Yearly average		10,942	3,784	7,158	-154	7,004	
Source - United Nations, 2011a							

Rather surprisingly, these long-run yearly average values are almost identical to those of the 2005-2010 period, the only notable difference being represented by the average number of net migrants that has soared to almost half a million (Table 2).

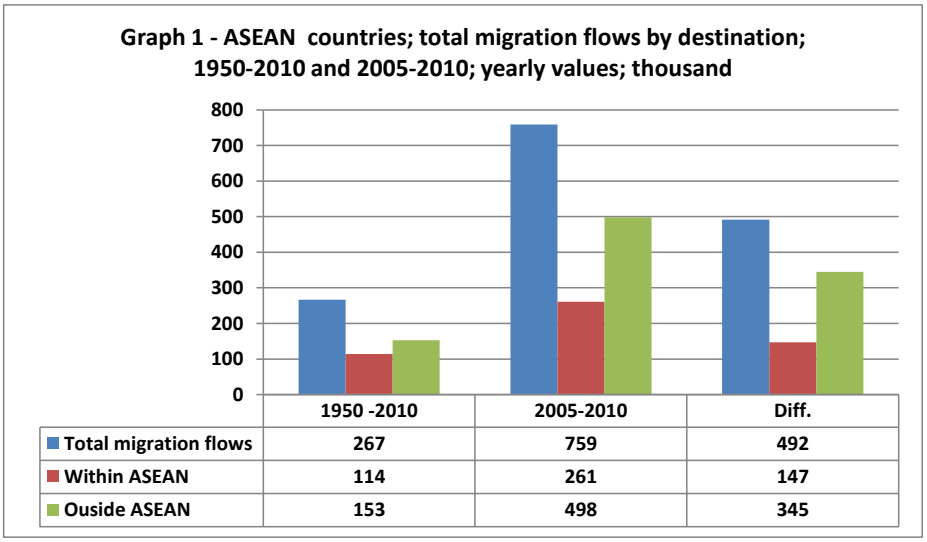
Table 2 - ASEAN countries; population, births deaths and migration balance; absolute values; 2005-2010

	Population 2005	Birth	Death	Natural Balance	Migration balance	Total balance	Population 2010
Brunei	809	40	5	35	9	44	853
Cambodia	13,358	1,605	565	1,040	-260	780	14,138
Indonesia	227,303	22,320	8,460	13,860	-1,295	12,565	239,868
Laos	5,753	720	195	525	-75	450	6,203
Malaysia	26,097	2,855	635	2,220	85	2,305	28,402
Myanmar	46,331	4,230	2,085	2,145	-500	1,645	47,976
Philippines	85,540	11,590	2,640	8,950	-1,235	7,715	93,255
Singapore	4,270	205	110	95	720	815	5,085
Thailand	66,668	4,365	2,430	1,935	490	2,425	69,093
Vietnam	83,168	7,360	2,240	5,120	-430	4,690	87,858
Total	559,297	55,290	19,365	35,925	-2,491	33,434	592,731
Yearly average		11,058	3,873	7,185	-498	6,687	
Source - United Nations, 2011a							

Between 1950 and 2010 the largest migration flows were originated by Philippines (more than 5 million), followed by Indonesia (4.6 million), Vietnam (3.2 million), Myanmar (1.8 million), Cambodia (0.8 million) and Laos (0.5 million). Positive migration balances were registered by Thailand (2.6 million), Malaysia and Singapore, with 1.8 million each, and Brunei with 0.5 million[4]. Therefore, in 60 years six ASEAN countries have generated a little more than 16 million migrants (267,000 per year); of these 6.8 million (42.6 per cent) have

[4] The realism of these values will be discussed in a later paragraph.

moved to other ASEAN countries[5]), while 9.2 million have left the ASEAN region (57.4 per cent).



	1950 -2010	2005-2010	Diff.
Total migration flows	267	759	492
Within ASEAN	114	261	147
Ouside ASEAN	153	498	345

Source - Author elaboration on United Nations data, United Nations, 2011a

In the last 5 years, the yearly average number of migrants has grown to 759,000, 261,000 of which headed toward some ASEAN countries, while the other 498,000 left the region (Graph.1). The departure countries have remained the same, but out-migration is now very concentrated, with Indonesia and Philippines accounting respectively for 34.1% and 32.5% of the total. At the same time two countries, Singapore and Thailand, accounted for 92.8 per cent of the total positive migration balance. It must also be underlined that the percentage of migrants that have moved within ASEAN has diminished from 42.7 per cent over the total period to 34.4 per cent in the last 5-year period.

The demographic boom registered by all ASEAN countries has been the result of the so-called "demographic transition" that is also going to have a very strong impact on their demographic future. The demographic transition has been defined as the passage from a traditional demographic regime, characterized by high fertility and high mortality, to a modern demographic regime, characterized by low fertility and low mortality. The drop in fertility below replacement level that by now has already taken place in around 50 developed and developing countries puts in serious doubt that what we are witnessing is a transition, i.e. the passage from an equilibrium regime to another equilibrium regime. Therefore, from now on we will use the terminology demographic revolution that is much more suggestive of the creative demographic disorder that is presently affecting the world.

In 1950-55, in all ASEAN countries, the Total Fertility Rate (TFR) – that we can loosely define as the total number of children per woman- was well above world average (4.95) (Table 3). Only two countries, Laos and Indonesia, registered a TFR below 6, while in the Philippines the TFR was

[5] In this context, it should be underlined that 62% of the extraordinary demographic growth of Brunei is due to immigration.

above 7 and in Brunei exactly 7. In the other six countries the TFR ranged from 6.61, registered by Singapore, and 6 registered by Myanmar. After 60 years only Philippines and Laos register TFR above 3 and four countries (Myannar, Vietnam, Thailand and Singapore) are already below replacement level[6], while Indonesia and Brunei could reach this historical borderline during the present decade. In all these countries the TFR has dimished by more than 60%, with record values registered by Singapore (-81.1%) and Thailand (-73.5%).

Table 3 - ASEAN countries; total fertility rate; 1950-55 and 2005-10

	1950-55	2005-10	Abs. change	% change
Philippines	7.42	3.27	4.15	55.9
Laos	5.94	3.02	2.92	49.2
Cambodia	6.29	2.80	3.49	55.5
Malaysia	6.23	2.72	3.51	56.3
Indonesia	5.49	2.19	3.30	60.1
Brunei	7.00	2.11	4.89	69.9
Myanmar	6.00	2.08	3.92	65.3
Vietnam	6.20	1.89	4.31	69.5
Thailand	6.14	1.63	4.51	73.5
Singapore	6.61	1.25	5.36	81.1
Source - United Nations, 2011a				

A declining trend has characterized also mortality. Life expectancy has increased in all ASEAN countries, the most spectacular results having being achieved by Vietnam and Indonesia whose life expectancy at birth has increased respectively by 6.8 and 5.8 months per year. The spread between the maximum value (80.6, Singapore) and the minimum value (61.5, Cambodia) remains, however, very large[7] (Table 4).

Table 4 - ASEAN countries; life expectancy at birth; 1950 and 2010; years

	1950	2010	Absolute change (years)	Average yearly increase (months)
Cambodia	39.4	61.5	22.1	4.4
Myanmar	36.0	63.5	27.5	5.5
Laos	42.4	66.1	23.7	4.7
Philippines	55.4	67.8	12.4	2.5
Indonesia	38.8	67.9	29.1	5.8
Malaysia	55.4	73.4	18.0	3.6
Thailand	50.7	73.6	22.9	4.6
Vietnam	40.4	74.3	33.9	6.8
Brunei	57.7	77.5	19.8	4.0
Singapore	60.2	80.6	20.4	4.1
Max - Min	-18.3	-19.1	0.8	0.2
Source - United Nations, 2011a				

[6] The replacement level is the level at which total population remains constant and is approximately 2.1children per woman

[7] The main determinant of this large difference is represented by infant mortality.

These data do clearly show that ASEAN countries have been moving along the path of the demographic revolution at different speed, due to the political, economic and social events that have characterized their history in the second half of the XX century and in the beginning of the XXI century. The different position of each ASEAN country along the path of the demographic revolution can be captured and further documented with the help of other demographic indicators such as the Infant mortality rate and the structure of population by main age group.

The Infant mortality rate (IMR) plays a very important role in determining the level and the trend of life expectancy at birth (Table 5). In 1950, the Infant mortality rate (the number of children that die before reaching one year of age per thousand) presented a wide range of values that were reflected by life expectancy data. The most dramatic situation was that of Myanmar, where more than one child out of 5 died before age one; Singapore presented the best situation, but also in Singapore 1 child out of 16 died before age one.

Table 5 -ASEAN countries; Infant mortality rate; 1950 and 2010

	2010	1950	Dff.
Singapore	1.9	60.7	-58.8
Brunei	4.8	90.2	-85.4
Malaysia	7.7	96.4	-88.7
Thailand	12.4	130.3	-117.9
Vietnam	20.4	157.9	-137.5
Philippines	23.0	96.8	-73.8
Indonesia	28.8	191.9	-163.1
Laos	44.5	167.1	-122.6
Myannar	55.0	212.8	-157.8
Cambodia	62.4	165.1	-102.7
Max-Min	60.5	152.1	-91.6

Source - United Nations, 2011a

In the following 60 years, all ASEAN countries have made substantial improvements so that the worst-case scenario registered in 2010 is similar to the best-case scenario in 1950. Infant mortality has been completely eradicated in Singapore, and values of the IMR below 10 per thousand are registered in Brunei and Malaysia, with Thailand at 12.4. Vietnam, Philippines and Indonesia present values between 20 and 30, Vietnam and Indonesia being between the countries that have accomplished the biggest improvements, and Philippines the one with the worst performance. Laos, Myanmar, and Cambodia occupy the last three positions in the ranking.

In a first phase, the demographic revolution generates waves of births of increasing magnitude and then waves of declining magnitude. The passage of time makes each cohort move orderly along the path of life,

determining first a huge expansion of the proportion of children and then an increasing proportion of people in working age.

The different stage reached by each ASEAN countries along the path of the demographic revolution is therefore illustrated also by the percentage of young people and of WAP (Table 6). The percentage of the former is included between a minimum of 17.4 per cent in Singapore and a maximum of 35.5 per cent in the Philippines, with other three countries registering values above 30 per cent: Laos, Cambodia, and Malaysia. At the same time Singapore presents the highest percentage of WAP (73.6 per cent), and other three countries (Thailand, Vietnam, and Brunei) are characterized by values above 70 per cent. At the opposite end of the ranking we find as expected the Philippines, where WAP weights only 60.9 per cent, preceded by Laos, Cambodia, and Malaysia

Table 6 - ASEAN countries; total population; percentage composition by main age group; 2010

	0-14	15-64	65+	80+
Singapore	17.4	73.6	9.0	1.8
Thailand	20.5	70.6	8.9	1.7
Vietnam	23.6	70.4	6.0	1.2
Brunei	26.2	70.2	3.6	0.7
Myanmar	25.8	69.2	5.0	0.8
Indonesia	27.0	67.4	5.6	0.7
Malaysia	30.3	64.9	4.8	0.6
Cambodia	31.9	64.3	3.8	0.4
Laos	34.5	61.6	3.9	0.5
Philippines	35.5	60.9	3.6	0.4
Max - Min	18.1	12.7	5.4	1.4

Source - author elaboration on United Nations data, United Nation. 2011a

3 THE EVOLUTION OF WORKING AGE POPULATION

3.1 ASEAN

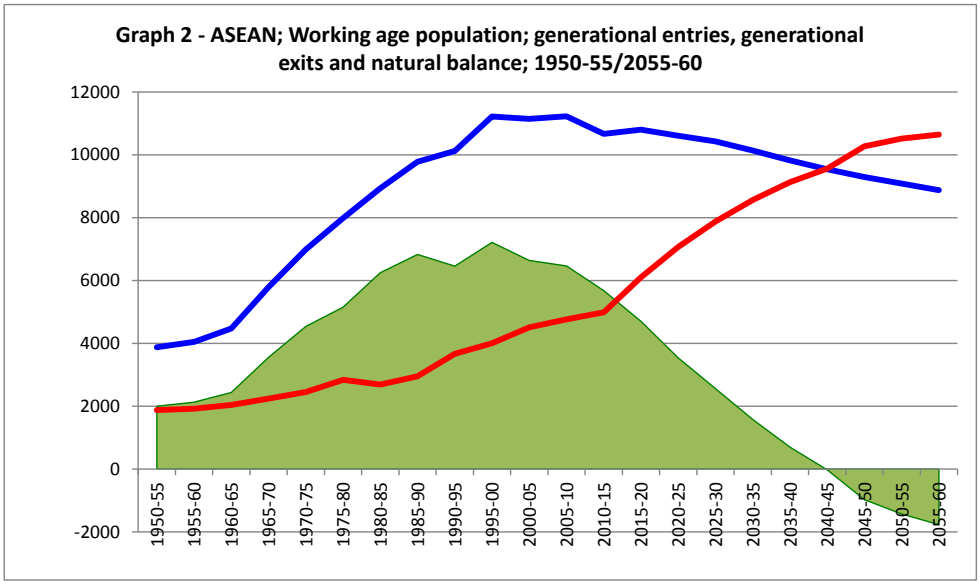
Given the scope of this paper, we will now concentrate our attention on the effects of the Demographic revolution on WAP that is the source of labor supply, a first necessary step to analyze labor mobility and the role of education and vocational training.

As we have already seen, from this perspective, one of the first impacts of the Demographic revolution is that of provoking an extremely relevant increase in WAP[8], a phenomenon that has initially characterized the

[8] The first manifestation of the demographic transition is the reduction of the infant mortality rate that will then be translated into an increase in the size of the cohorts entering reproductive age, while the TFR is still at the traditional level. This will, in its turn, provoke a progressive increase in the number of yearly births, a trend that will continue also when the fertility rate will start to drop, due to the increasing dimension of the cohorts in reproductive age. This is the chain of events that has

developed countries -the firsts to enter the demographic revolution in the XVIII and XIX century- then the developing countries from the middle of the XIX century, and is now starting to affect the least developed countries.

Graph 2 shows the impact of the demographic revolution on the total WAP of ASEAN. Initially, the expansion in WAP has been driven by an extraordinary increase in generational entries[9] that grew from an average yearly value of around 4 million in the fifties to record values of above 11 million between 1995 and 2010. Generational exits have started to register relevant increases only at the beginning of the '90s when bigger cohorts have reached "retirement age". As a consequence of these events as well of the migration flows we have previously documented, the WAP of ASEAN has increased from 100 million in 1950 to 398 million in 2010. We can, therefore, safely assume that at present the ASEAN WAP is above 400 million.



Source - Author elaboration on United Nations data, United Nations, 2011a

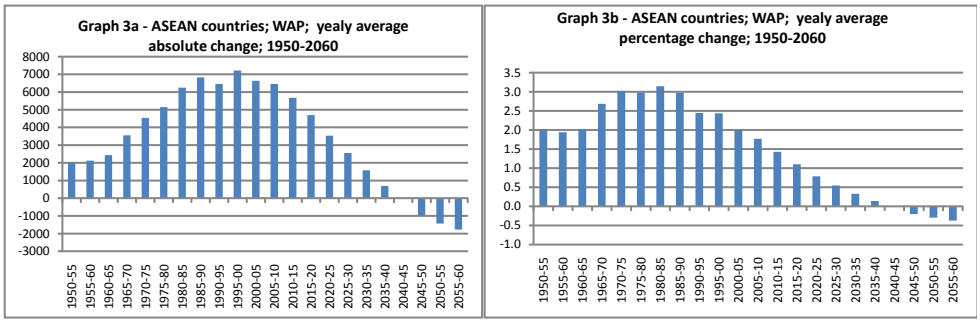
At the beginning of the new century ASEAN WAP starts to exhibit the second effect of the demographic revolution: a progressive, but rather fast slowdown in its rate of growth, due mainly to the increase in generational exits, but also to the smaller number of young people reaching working age. According to the U.N. Population Division, in about 30 year, generational exits from WAP will begin to exceed generational entries and WAP will start to decline. On the basis of the hypotheses adopted by the Population Division for the Medium variant scenario, inclusive of the assumptions on migration that we will discuss in a later paragraph, ASEAN

determined the explosion of WAP in developed countries in the second half of the XIX century and at the beginning of the XX.

[9] Generational entries are equal to the number of people who become 15 in the time interval considered, while generational exits are equal to the number of people who become 65 in the same period plus the people who died.

WAP is expected to peak at 491 million in 2040, to then decline to 470 million in 2060[10].

Graphs 3a and 3b present the evolution of the yearly average absolute change and of the yearly average rate of growth of WAP registered between 1950 and 2010 and the values forecasted for the following 50 years.



Source - Author elaboration on United Nations data, United Nations, 2011a

The absolute growth of ASEAN WAP did reach a maximum value of 7.2 million in the 1995-2000 interval, and is now down to around 6 million; it is expected to decline to 3.5 million at the beginning of the 2020s, to 1.5 million at the beginning of the 2030s, and to become negative in the 2040s. The percentage rate of growth did peak earlier, in the 1980-85 period, at 3.1 per cent. It is now down to 1.4 per cent, and is expected to decline by around 60 per cent every ten years.

These data show that the pressure to create additional jobs in order to accommodate the incoming generations is already declining and it will continue to do so in the foreseeable future. This trend will, on one hand, facilitate the ongoing process of modernization, i.e. the substitution of employment in the agricultural sector with employment in the modern sectors, but on the other will make unavoidable a marked increase in the exchange of Labor force within ASEAN.

3.2 The country level

As we have already discussed, the ten countries that constitute ASEAN have been moving along the path of the demographic revolution at different speed and, therefore, they are presently located in different stages of this process. As we will discuss in the following paragraphs, this has very important implications with respect to internal and external mobility.

WAP, net of migrations, is forecasted to continue to grow until 2060 in only two of the ten ASEAN countries, Malaysia and Philippines. In all the other eight, an historical maximum will be reached at or before 2050. The first country whose WAP would peak in absence of migration is Singapore, in 2015; Thailand will follow in 2020; Myanmar, Vietnam and Indonesia in 2035; Brunei in 2040; Cambodia in 2045; Laos in 2050 (Table 7).

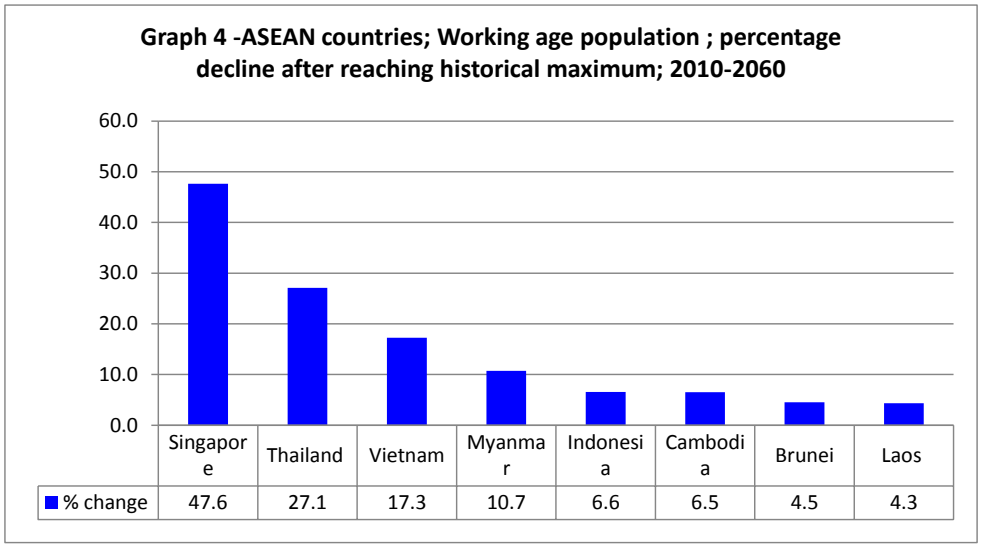
[10] See United Nations, 2011a

Table 7 -ASEAN countries; Working age population; absolute values; 1950 -2060

	Singapore	Thailand	Myanmar	Vietnam	Indonesia	Brunei	Cambodia	Laos	Malaysia	Philippines	ASEAN
1950	585	11,257	10,704	18,063	42,561	29	2,395	966	3,305	9,717	99,582
1960	897	14,770	11,709	19,520	51,944	43	2,980	1,174	4,167	12,985	120,189
1970	1,202	19,395	14,241	22,891	63,349	68	3,746	1,481	5,666	18,085	150,124
1980	1,647	27,045	18,301	29,361	83,461	112	3,778	1,699	7,946	25,188	198,538
1990	2,200	37,259	23,418	38,242	110,202	157	5,086	2,209	10,796	34,334	263,903
2000	2,791	43,654	28,970	49,079	137,966	218	6,893	2,873	14,715	45,079	332,238
2005	3,068	46,417	31,053	55,554	150,282	247	8,058	3,287	16,572	50,877	365,415
2010	3,742	48,786	33,206	61,842	161,699	282	9,090	3,821	18,432	56,819	397,719
2015	3,783	49,935	35,428	65,930	173,599	302	10,083	4,389	20,191	64,315	427,955
2020	3,669	50,071	36,773	68,438	184,564	320	10,892	4,872	21,799	71,721	453,119
2025	3,421	49,211	37,799	70,570	192,514	335	11,641	5,296	23,044	78,505	472,336
2030	3,176	47,794	38,519	71,714	197,661	345	12,308	5,669	24,117	85,162	486,465
2035	2,898	45,855	38,792	71,924	199,921	353	12,884	6,004	25,203	91,690	495,524
2040	2,705	43,870	38,484	70,955	199,899	355	13,339	6,272	26,191	97,971	500,041
2045	2,529	41,918	37,950	69,193	198,032	352	13,775	6,440	27,031	103,607	500,827
2050	2,356	39,966	37,063	66,263	194,648	351	13,500	6,493	27,623	108,480	496,743
2055	2,201	38,084	35,827	62,866	190,939	345	13,275	6,408	28,010	112,377	490,332
2060	1,981	36,171	34,632	59,515	186,766	339	12,876	6,212	28,207	115,439	482,138
1950-2010	3,157	37,529	22,502	43,779	119,138	253	6,695	2,855	15,127	47,102	298,137
2010 -2060	-1,761	-12,615	1,426	-2,327	25,067	57	3,786	2,391	9,775	58,620	84,419
Max - 2010	41	1,285	5,586	10,082	38,222	73	4,685	2,672	9,775	58,620	103,108
2060-Max	-1,802	-13,900	-4,160	-12,409	-13,155	-16	-899	-281	9,775	58,620	-18,689

Source - Author elaboration on United Nations data, United Nations, 2011a

As a consequence, in absence of migration, these eight countries will register very substantial declines in WAP although over different time intervals, the duration of the interval obviously playing a central role in determining the amount of the decline. Singapore, the most advanced country along the demographic revolution and the first to register the historical peak of WAP, is forecasted to lose almost 50 per cent of its WAP, Thailand 27.1 per cent, Vietnam 17.3 per cent, Myanmar 10.7 per cent and the other countries percentages between 4 and 7 per cent (Graph 4) All together the WAP of these countries is expected to decline by around 45 million.



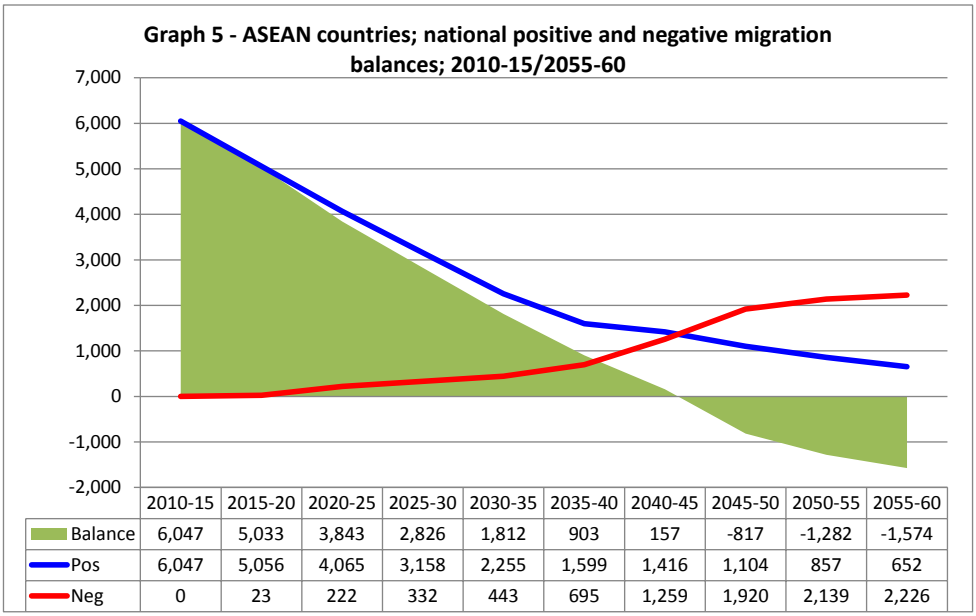
Source - Author elaboration on United Nations data, United Nations, 2011a

The most suggestive aspect is, however, that from 2015 ASEAN will start to include an increasing number of countries that will be characterized by a declining WAP and others where WAP will still be growing, but at a diminishing pace.

Table 8 - ASEAN countries; Working age population; absolute yearly change; 2010-2060; thousand

	Singapore	Thailand	Myanmar	Vietnam	Indonesia	Brunei	Cambodia	Laos	Malaysia	Philippines	ASEAN
	Absolute yearly change										
2010-2015	8	230	444	818	2,380	4	199	114	352	1,499	6,047
2015-2020	-23	27	269	502	2,193	4	162	97	322	1,481	5,033
2020-2025	-50	-172	205	426	1,590	3	150	85	249	1,357	3,843
2025-2030	-49	-283	144	229	1,029	2	133	75	215	1,331	2,826
2030-2035	-56	-388	55	42	452	2	115	67	217	1,306	1,812
2035-2040	-39	-397	-62	-194	-4	0	91	54	198	1,256	903
2040-2045	-35	-390	-107	-352	-373	-1	87	34	168	1,127	157
2045-2050	-35	-390	-177	-586	-677	0	-55	11	118	975	-817
2050-2055	-31	-376	-247	-679	-742	-1	-45	-17	77	779	-1,282
2055-2060	-44	-318	-239	-670	-835	-1	-80	-39	39	612	-1,574

Source - Author elaboration on Population Division data, United Nations, 2011a



	2010-15	2015-20	2020-25	2025-30	2030-35	2035-40	2040-45	2045-50	2050-55	2055-60
Balance	6,047	5,033	3,843	2,826	1,812	903	157	-817	-1,282	-1,574
Pos	6,047	5,056	4,065	3,158	2,255	1,599	1,416	1,104	857	652
Neg	0	23	222	332	443	695	1,259	1,920	2,139	2,226

Source - Author elaboration on United Nations data, United Nations, 2011a

Graph 5 shows how the progressive reduction in ASEAN WAP growth and its becoming negative starting in 2040 will be brought about by the fact that an increasing number of countries will register a negative trend in their WAP.

4 THE CAUSES OF ECONOMIC MIGRATIONS

International migration flows are largely explained by the co-presence of countries characterized by a structural lack of labor supply and countries characterized by a structural excess of labor supply[11], the thesis being that migrations are demand driven, but take place only when excess supply is present in other countries[12].

[11] For a detailed presentation of the model and an application to a series of countries and areas with below replacement fertility see M. Bruni, 2009; for an application to China see M. Bruni 2013 and 2011, and M. Bruni and C. Tabacchi, 2011.

[12] According to this perspective the Migration Balance of arrival countries are determined by their Total Manpower Needs. As a consequence the world total migration flows are largely determined by the need of labor in arrival countries.

We will say that a country is characterized by a structural lack of labor supply, when a relevant share of the available jobs cannot be covered by the local labor supply. Analogously, we will say that a country is characterized by a structural excess of labor supply when a relevant and growing share of its labor supply cannot find employment. The countries characterized by a structural lack of labor supply are potential countries of arrival, while the countries characterized by a structural excess of labor supply are potential countries of departure.

Let's define Total Manpower Needs as the difference between the increase in labor supply and the increase in labor demand, over a given time interval. Taking an operational perspective, the change in labor supply can be identified with the change in the level of the local Labor force (ΔLF) registered or forecasted over a given interval (t, t+1). The increase in labor demand can be identified with the change in the level of employment (ΔE) registered or forecasted over a given interval (t, t+1).

The absolute change in the Labor force is the results of two components, one of demographic origin, the second connected to the propensity of the people in working age to participate in labor market activities. The former is identified in the change of the level of the Labor force due to the change in the level of Working age population, keeping the participation rate constant. Therefore, it is equal to the product between the change in WAP (ΔWAP) [13] and the rate of participation (rop) at the beginning of the period. The latter is the result of the change in participation behavior taking place during the interval considered, and it is equal to the product between the change in the rate of participation and the level of the Labor force at the end of the period.

$$1]\ {}_tTMN_{(t+1)} = {}_t\Delta LF_{(t+1)} - {}_t\Delta E_{(t+1)}$$
$$= [(rop_t * {}_t\Delta WAP_{(t+1)}) + ({}_t\Delta rop_{t+1} * LF_{(t+1)})] - {}_t\Delta E_{(t+1)}$$

All three components of [1] can be positive or negative, depending on the trends in Employment, Labor force and Rate of participation. This implies that also Manpower Needs can be positive or negative.

A negative value of TMN implies that the growth in labor supply has been (or is forecasted to be) smaller than the growth in employment. As we have already stated, a negative difference between the change in labor supply and labor demand identifies a situation of structural lack of labor supply if it is a growing, and long-lasting phenomenon. In a first phase the difference can be, at least partially, satisfied by the unemployed, by an increase in Labor force participation, especially women, by internal migrations from more underdeveloped internal areas. Sooner or later, these additional sources of labor supply will necessarily be exhausted and international migrations will represent the only possible solution.

By converse, a positive value does imply that the country is accumulating an excess of labor supply that cannot be satisfied by local

[13] What we will consider is in fact the natural balance of WAP, which is equal to the difference between generational entries and generational exits inclusive of the deaths registered during the period.

demand[14]. As in the previous case, this situation can be identified as Structural excess of labor supply if it is a growing, and long-lasting phenomenon. In this case, the situation initially can be dealt with by an expansion of the informal economy, a widening of the average dimension of the family and by a reduction in the participation rate, especially of women. However, in the long run, only massive migration flows can solve the problem. In their absence, a growing number of young people will find themselves without any perspective for the future, and could be willing to do anything because a life without job is also a life without value. Also in this case, in the long run only migration can provide a solution to the problem

A few final considerations are needed. In the first place what we are considering are the very special situations that have been created, are created and will inevitably be created by the demographic revolution. They are characterized by changes in the level of WAP of such a dimension that cannot be dealt with, on one hand, by wage adjustments or increases in productivity and, on the other, by high rates of growth of employment.

The declines in WAP brought about by the demographic revolution have often such a dimension and will span over such a long period that it is totally unrealistic to assume that labor productivity could grow enough to both offset the decline in labor supply and allow production to grow. Let's for instance consider the case of Japan. According to the Population Division medium variant scenario, between 2010 and 2060, the WAP (15-64) of Japan is expected to decline by 34.8 per cent, from 81 to 53 million. The direct implication is that in order to avoid more immigrants than the 2.8 million hypothesized by the UNPD, labor productivity should increase by 34.8 percentage points more[15] than the percentage growth in production[16].

Given that the increase in labor productivity does not represent a viable alternative to migration, do other alternatives exist? The only economically viable alternative is to move production abroad. However it has been rightly observed: "As its economy matured and its population aged, a country could safely become a rentier state, boosting its economic product, and in particular paying its pensions, with the income from its international investments. The more youthful countries on the receiving end would no doubt prefer the inflow of capital to an outflow of labor. In the world as it is, however, that may be a less prudent portfolio diversification by an ageing society of retirees than an hostage to fortune." [17] In practice, the delocalization of production is a viable economic solution, but it presents risks that a country could not be willing to take.

[14] It should be obvious that in all the countries that find themselves in this situation the real wage already at or below the subsistence level cannot be an answer to the problem.

[15] In the last 50 years production has increased more than productivity in all industrialized countries as shown by the fact that in the long run employment has increased in all of them, declining only in periods of heavy restructuring of the production structure or of economic crisis. It must also be recalled that the larger the service sector the more difficult is to achieve high rate of growth of productivity or, stated in another way, the employment-income elasticity tends to be low in post industrial economies.

[16] This is implicit in the fact that the growth in employment is identically equal to the difference between the rate of growth in production an the rate of growth in productivity.

[17] McNicoll, D. 2000

The situation of excess labor supply generated by the Demographic revolution normally takes place in countries still largely dominated by the agricultural sector and in which the process of modernization requires not only the expansion in the employment level of Industry and Services, but also a growth in the employment level of these two sectors sufficient to replace non productive jobs in agriculture. Initially, the most probable outcome is that agriculture absorbs the excess of labor supply determining the situation described in Lewis seminal article in which the real wage is at subsistence level. However, with time large migration flows could be the only available mean to avoid the spread of poverty and income inequality.

The last point we have to consider is the relationship between Manpower needs and migration flows. In general we can say that the level of migration is positively related to manpower needs:

$$2] \quad Migr = B\ TMN$$

where B is equal to or greater than 1. At the beginning of any economic emigration process, only workers will move to the destination country. With time, they will be eventually reached by some members of the family. Therefore, at the initial stage B is equal to 1 and will then progressively increase. Previous analyses have shown that at present, in countries of old migration, B is equal to approximately 1.5[18].

5 ASEAN MIGRATION IN THE INTERNATIONAL CONTEXT

ASEAN includes countries like Philippines and Indonesia whose workers are migrating not only within ASEAN and to other Asian countries, but also to Europe, America and Australia, while Singapore, Thailand and Malaysia are becoming prominent arrival countries. To provide some more solid reference points to the forecasting exercise we are going to present in the following paragraphs, we deem relevant to present a concise overview of the tendencies in international migrations and project the migratory behavior of ASEAN countries against the general background of the Asian continent.

Between 1950 and 2010, international migration flows have been characterized by three main trends: i) a substantial increase in the total level; ii) a notable increase in the percentage of intercontinental flows; iii) very relevant changes in the structures of both arrival and departures flows by area and continent.

Between 1950-55 and 1990-95 international migration flows have increased almost fourfold, from 6 to 28.6 million, a value that still marks the historical maximum. After a small contraction registered in the last five years of the century, between 2000 and 2010, around 54 million people have left their native countries, bringing the total number of world migrants in the last sixty years above the 200 million mark (Table A1).

Between 1950 and 1960, intercontinental migration flows represented 48 per cent of total international migration flows (6.7 million out of 14 million); between 2000 and 2010 the percentage has increased to 62 per cent (34 out of 54 million) (Table A1).

[18] M. Bruni, 2009

In the former period, intercontinental migration flows were generated, in order of importance, by Europe, Africa and South America, while the main areas of arrival were the New World Countries (NWC: USA, Canada, Australia, and New Zealand) and Asia. In the latter period, departures were generated mostly by Asia, Central and South America, and Africa, while the main areas of arrival were Europe, NWC and Gulf Countries (GC). Therefore, in only sixty years, Europe has become the main area of arrival, while Asia has become the world major supplier of labor.

Between 1950 and 1960, the NWC were the main pole of attraction of international migration flows. They received around half a million migrants per year, i.e. 36.4 per cent of total migration flows. Western Europe (with France and Germany, but also Switzerland, Belgium and Sweden) was the second pole of attraction. Brazil, Argentina and Venezuela represented the third pole of attraction (Table A2).

Fifty years later the situation has radically changed. As we have already seen, Europe has become the main port of arrival, while the Countries of the Gulf have become the third largest pole of attraction after the NWC. Eastern, Central and especially Southern Asia, Central and Southern America, Northern, Eastern and Western Africa are now the areas that provide labor to the rest of the world. More specifically, on one hand:

- Europe has received 20.1 million migrants [19];
- Arrivals in the NWC have been in excess of 15 million; 72.8 per cent have chosen the US, 11.7 per cent Australia, 4.3 per cent Canada and 1.3 per cent New Zealand;
- The GCs have attracted 8.7 million immigrants, 3.9 million of which went to the Arab Emirates and 2.8 million to Saudi Arabia.

On the other hand, both Latin America and Africa had negative migration balances of respectively 11.2 million[20] and 6.3 million[21].

Beside the six Gulf countries, other 15 Asian countries have registered positive migration balances so that the total number of arrivals has exceeded 14 million, while 27 countries have been affected by negative migration balances for a total amount of 30.6 million. Therefore, the continental migration balance has been negative and equal to around 16 million (Table A3).

After the two largest gulf countries (Arab Emirates and Saudi Arabia), the main arrival country has been Thailand, followed by Qatar and Singapore. The list of Asian arrival countries includes other 5 countries in

[19] Of the 40 European countries 27 are arrival countries and 13 departure countries. The main arrival countries have been, in order of relevance, Spain, Italy, the Russian Federation, and the United Kingdom, followed by the more traditional arrival countries such as France and Germany, together with Sweden, Belgium and Austria. Exits from the departures countries have been only 1.8 million.

[20] Between 2000 and 2010 only 8 Latin America countries have registered a positive migration balance, and for a very modest total value of 0.4 million. Negative migration balances, for a total value of 11,6 million, have been registered by the other 28 countries. Mexico with 4.4 million (37.9 per cent of the total) leads the ranking followed by Peru, Brazil, El Salvador and Guatemala.

[21] In Africa 16 countries have registered positive migration balances for a total value of almost 4 million; 36 have registered negative migration balances summing to more than 10 million. South Africa (1.6 million) has been the most important arrival country followed by Burundi and Sierra Leone, both accounting for more than half a million immigrants. The ranking of arrival countries is lead by Zimbabwe, followed by Morocco, Ivory Cost, Guinea and Egypt.

Eastern Asia, (Azerbaijan, Cyprus, Israel, Jordan, and Lebanon), but also Afghanistan and Bhutan, Hong Kong and Macao, Malaysia, Brunei and Japan. If the main country of departure has been India -that has generated almost half a million migrants per year- other 5 countries have registered more or about 250,000 departures per year: Bangladesh, China, Pakistan, Indonesia and Philippines. These six countries are between the seven most important departure countries, the other being Mexico, that ranks second after India (Table A2).

In conclusion, of the 21 Asian arrival countries, 4 are ASEAN countries, Thailand and Singapore being respectively the third and fifth more relevant arrival countries in Asia. At the same time, other two ASEAN countries, Philippines and Indonesia, are fifth and sixth in the Asian ranking of departures countries and sixth and seventh in the world ranking[22].

6 LABOR MARKET AND DEMOGRAPHIC SCENARIOS

We will now propose some Manpower Needs and Migration scenarios for the three ASEAN countries that have registered the largest positive migration balances during the 2005-2010 period: Singapore, Thailand and Malaysia[23]. The scenarios have been constructed on the basis of the model we have previously introduced.

The scenarios are relevant not only because Singapore and Thailand are the two ASEAN countries that have reached the most advanced stage of the demographic revolution, but because they will be the firsts to register a negative natural balance of WAP (15-64) that will then progressively increase in absolute value. Malaysia, while having progressed a lot in terms of life expectancy and infant mortality is still characterized by a rather high TFR and, according to the Population Division, its TFR is expected to decline at much lower speed than those of the other ASEAN countries. However, as we have already seen, Malaysia has already been receiving a relevant, although smaller than in the past, number of migrants.

6.1 Main tendencies of the labor market in Singapore, Thailand and Malaysia

Between 2005 and 2010, Singapore, Thailand and Malaysia have registered notable percentage increases in the level of employment (Table 9), the record value (34.4 per cent) being that of Singapore, followed by Malaysia (10.8 per cent), and Thailand (7.9 per cent). Despite the positive migration flows registered during the same period, in Singapore and Thailand the Labor force has grown less than employment. Therefore, both countries have registered a decline in the level of unemployment, and obviously an even more pronounced decline in the rate of unemployment. In Malaysia, Labor force has increased slightly more than employment, but the unemployment rate has declined. Taken together, the 3 countries have

[22] The average yearly values have been: 144,000 (Singapore), 98,000 (Thailand) and 17,000 (Malaysia).
[23] The other country to register a positive migration balance has been Brunei.

generated, over the five-year period, 4.6 million jobs, equal to a percentage increase of 9.8 per cent, while the Labor force has expanded by 4.4 million.

Table 9 - Singapore, Thailand and Malaysia; main labour market variables and indicators; 2005 ad 2010

	2005	2010	Abs. change	% change	2005	2010	Abs. change	% change
	Singapore				Thailand			
Employment	2,267	3,047	781	34.4	35,257	38,037	2780	7.9
Unemploymen	101	89	-12	-11.6	663	402	-261	-39.3
Labour force	2,367	3,136	769	32.5	35,920	38,440	2519	7.0
WAP (65 +)	3,376	4,198	822	24.4	48,942	52,856	3914	8.0
roa	70.1	74.7	4.6	6.5	73.4	72.7	-0.7	-0.9
roe	67.1	72.6	5.4	8.1	72.0	72.0	-0.1	-0.1
rou	4.2	2.8	-1.4	-33.3	1.8	1.0	-0.8	-43.3
	Malaysia				Total			
Employment	10,045	11,129	1084	10.8	47,569	52,214	4645	9.8
Unemploymen	368	388	20	5.4	1,132	879	-253	-22.3
Labour force	10,414	11,517	1104	10.6	48,701	53,093	4392	9.0
WAP (65 +)	16,451	18,369	1918	11.7	68,769	75,423	6654	9.7
roa	63.3	62.7	-0.6	-0.9	70.8	70.4	-0.4	-0.6
roe	61.1	60.6	-0.5	-0.8	69.2	69.2	0.1	0.1
rou	3.5	3.4	-0.2	-4.7	2.3	1.7	-0.7	-28.8

Sources - National data from various sources

As we have already seen, according to the United Nation Population Division, between 2005 and 2010, Singapore, Thailand and Malaysia have registered net migration balances of respectively 720,000, 490,000 and 85,000 people, for a grand total of 1,295,000, a value that, as we will see later, does probably largely underestimate the real value. It is therefore evident that without migrants the growth in labor supply would have been insufficient to face the growth in labor demand: in Singapore migrants have covered almost the total increase in labor demand (95.2 per cent), in Thailand 17.6 per cent and in Malaysia around 11 per cent. Therefore, migrants have covered 30 per cent of the 4.6 million total increase in employment registered by the three countries taken together.

6.2 Hypothesis and computational procedures

In order to provide some indications on the probable trends in the number and typology of migrants that will be needed by Singapore, Thailand and Malaysia in the next 25 years, we have proceeded to build for each countries labor market and demographic scenarios for the period 2010-35, articulated on five-year periods. As indicated in a previous paragraph, the future level of the Migration balance of these three countries will depend mainly on their Manpower needs that, in their turn, will be the result of the trends in labor supply and labor demand.

We recall, first of all, that our scenarios will be based on population, employment and labor force 15 years and older. This choice has been imposed by the fact that all three countries are characterized by a large labor market participation of people above 64 years of age, and by the consideration that this segment of potential supply is going to increase enormously in the next 25 years, as shown in table 10.

Due to its high TFR Malaysia has remained the youngest of the three countries we are considering with a percentage of elderly of only 4.8 per

cent versus values of 8.9 and 8.7 per cent in Singapore and Thailand. According to the Medium variant projection of the Population Division, in the next 25 years, the percentage of elderly will reach 14.5 per cent in Malaysia, 19.6 per cent in Thailand and 26.9 per cent in Singapore.

Table 10 -Singapore, Thailand and Malaysia; Population 65 year and older; 2010-35

	Singapore		Thailand		Malaysia	
	Abs. value	%	Abs. value	%	Abs. value	%
2010	454	8.9	6,002	8.7	1,368	4.8
2035	1,634	26.9	14,284	19.6	4,461	14.5
Diff.	1,180	17.9	8,282	10.9	3,093	9.7

Source - Author elaboration on Population Division data, United Nations, 2011a

Coming now to our computations, the absolute change in labor supply for each of the five year period from 2010-2035 has been estimated by i) computing the absolute change in WAP for each period and ii) multiplying it by the 2010 rate of participation. We must point out that:

- We have considered only one demographic scenario based on the Medium variant projection of the Population Division, the reason being that the other scenarios do not present notable differences since: i) the people who will enter WAP in the next fifteen years are already born; ii) those that will enter WAP in the following 10 years are those that will be born in the next 8 years and no dramatic changes in the TFR are at present foreseeable; iii) all the UN scenarios adopt the same hypotheses on mortality.
- According to the previous model, another element that affects the trend in the level of labor supply is the rate of participation, or more specifically its changes over time. As we have already suggested, Singapore and Thailand boost extremely high participation rates (74.7 and 72.7 per cent) that have been increasing under the pressure of and expanding demand. In Malaysia the rate of participation is about ten points lower (62.7 per cent) due to the limited presence of women in the labor market. Are these national rates going to converge? Up to now, in developed countries the process of modernization has brought strong reduction in the labor market presence of the elderly; however, it is already evident that the lengthening of the training phase, the ageing process together with the improvement in health conditions and the restriction in the welfare system imposed by much tighter economic situations are going to push in the opposite direction and keep older people in the labor market longer than at present. This would seem to suggest that in Singapore and Thailand opposite forces could maintain the rate of participation at around the present value. In Malaysia the situation presents an additional factor, the behavior of the cohorts of young girls entering the labor market in the next years. If it is possible that

the rate of participation of the next cohorts will be higher than that of the previous generations, their contribution to labor market participation could be countered by the fact that both boys and girls will tend to remain longer in the training phase of life. In conclusion, due to the lack of strong evidences in one direction or on the other we have assumed a constant rate of participation.

For Thailand and Malaysia, the absolute change in labor demand has been computed on the basis of two alternative hypotheses: i) a constant rate of growth equal to the one registered between 2005 and 2010 (scenario A); ii) a constant employment growth equal to the absolute growth registered in the same period (Scenario B). In scenario A the absolute change in employment increases progressively, in scenario B the percentage rate of growth declines progressively. In substance, the first scenario is more optimistic, but probably less realistic.

In Thailand, in Scenario A, employment increases of around 17.5 million (46.2 per cent) over 25 years, while in Scenario B employment grows by little less than 14 million (36.5 per cent) (Table A4). In Malaysia, in Scenario A, employment grows by 7.5 million (66.9 per cent), in Scenario B by 5.4 million (48.7 per cent) (Table A8).

In the case of Singapore the construction of the scenario had to acknowledge the fact that between 2005 and 2010 employment has grown by an astounding 34.4 per cent. The adoption of such a rate would produce what appears as a totally unrealistic growth in employment (from a little more than 3 million in 2010 to around 11.5 million in 2035). For Scenario A we have therefore assumed a constant average growth rate equal to half that registered between 2000 and 2010. Such a rate, 22.5 per cent, is still more than the double of that adopted for Malaysia (10.8 per cent) and that adopted for Thailand (7.9 per cent). With this assumption Employment grows to around 8.5 million, i.e. 179 per cent.

In analogy with what was done for Thailand and Malaysia, Scenario B assumes a growth in the level of employment equal to that registered between 2005 and 2010 (781,000). In this scenario the rate of growth progressively declines from an initial value of 25.6 per cent during the first five-year period, to 12.7 per cent between 2030 and 2035 and total employment increases from 3 to almost 7 million.

Since in the long run both scenarios could be too optimistic, a third Scenario (Scenario C) is proposed. In this scenario the initial growth rate of employment, taken equal to the one used in Scenario A, is progressively halved down to a value of 1.4 per cent in the last five-year period. In this Scenario the growth in employment is obviously much more limited and equal to 1.5 million over the entire period, a value which however corresponds to a 51 per cent increase over the 2010 value.

The following step has been that of comparing the increase in supply with the increase in labor demand proposed by each scenario in order to estimate whether and how much of the additional labor demand can be covered by the local labor supply, over the next 25 years.

6.3 Manpower Needs

The results of the exercise are summarized in table 11 that presents the Total Manpower Needs that Singapore, Thailand and Malaysia will have to face in the next 25 years in the two scenarios we have previously described. The detailed analysis is presented in the Statistical Annex (Table A4 for Thailand, Table A6 for Singapore, and Table A8 for Malaysia).

Let's observe first of all that in both Singapore and Thailand the absolute changes in labor supply will progressively decrease to become negative in the 2030-35 period. The situation is totally different in Malaysia where the absolute change in Labor force will peak around 2020 and will then decline very slowly in the following years[24].

Table 11 - Singapore, Thailand and Malaysia; Total manpower needs; 2010-2035

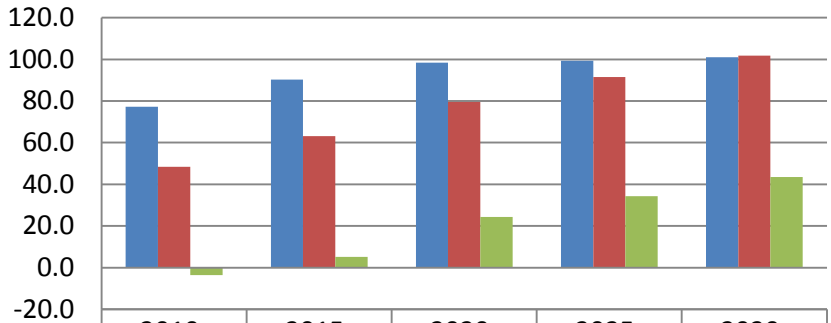
	Singapore	Thailand	Malaysia	Total
	Manpower needs			
2005-2010	-720	-490	-85	-1,295
	enario A: Constant rate of employment grow			
2010-2015	-535	-1,452	43	-1,944
2015-2020	-768	-2,043	-68	-2,879
2020-2025	-1,026	-2,775	-358	-4,159
2025-2030	-1,272	-3,444	-559	-5,275
2030-2035	-1,587	-4,138	-788	-6,512
Total	-5,188	-13,851	-1,730	-20,769
Yearly average value	-208	-554	-69	-831
% distribution	25.0	66.7	8.3	100.0
	Manpower needs			
	Scenario B: Constant employ. growth			
2010-2015	-623	-1,233	160	-1,695
2015-2020	-698	-1,588	178	-2,108
2020-2025	-763	-2,064	32	-2,795
2025-2030	-772	-2,457	-10	-3,239
2030-2035	-795	-2,854	-62	-3,712
Total	-3,652	-10,196	298	-13,549
Yearly average value	-146	-408	12	-542
% distribution	26.9	75.3	-2.2	100.0
Sources - National data from various sources				

[24] If we had used WAP (15-64) the change of sign in Singapore and Thailand would have taken place in the 2015-20 period. The difference we register is due to the ageing process we have previously discussed.

The growth in employment hypothesized in scenario A provokes very large and increasing Manpower needs that sum up to almost 21 million over the 2010-2035 period. Sixty seven per cent would be originated by Thailand (13.9 million), 25 per cent by Singapore (5.2 million), and 8.3 per cent by Malaysia (1.7 million). In Singapore the ratio between Manpower needs (in absolute value) and changes in employment surges from 77.2 per cent in 2010-15 to 90.3 per cent in 2015-20, to then progressively increase to a value of 101 per cent in 2030-35 (Graph 6). In Thailand this ratio is always smaller than in Singapore until the end of the 2020s, but then leaps to 101.8 in the 2030-35 period. As we have already underlined, in Malaysia the growth in labor supply will be relatively much more pronounced since the drop in fertility has been more limited than in Singapore and Thailand. As a consequence, the local Labor force should be more than sufficient to cover the additional jobs created in the 2010-15 period. Manpower needs become negative in the following interval and will then progressively increase to represent 43.5 per cent of additional employment in 2030-35.

Scenario B (that assume a constant growth in the level of employment and therefore a declining rate of growth) generates a lower amount of Manpower needs (13.5 million) and some other qualitative differences. The distribution of Manpower needs between the three countries is more skewed, with Thailand accounting for 75.3 per cent, Singapore for 26.9 per cent and Malaysia presenting an overall negative value.

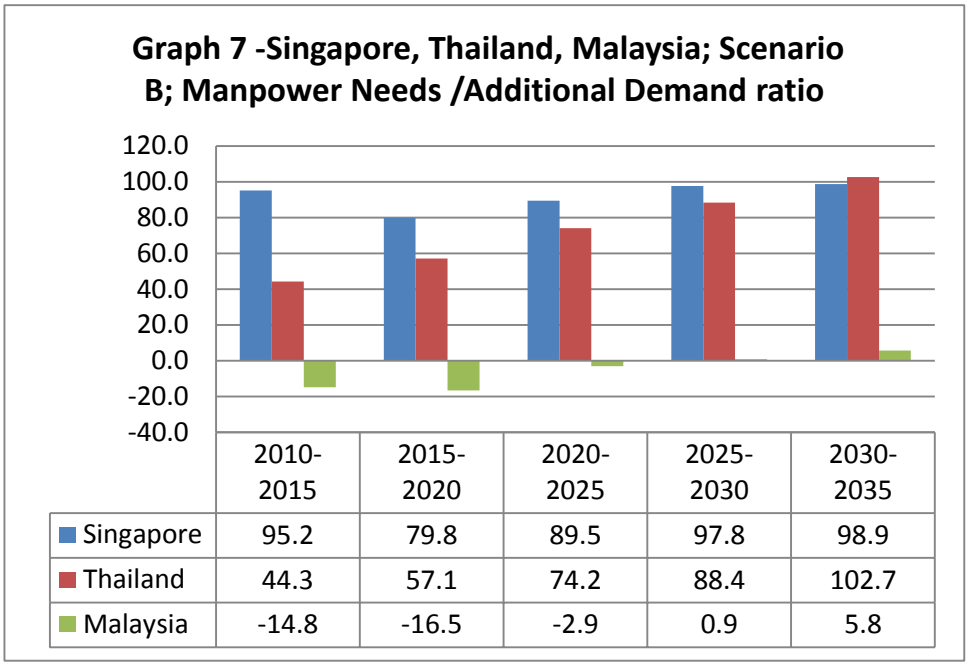
Graph 6 - Singapore, Thailand, Malaysia; Scenario A; Manpower Needs /Additional Demand ratio



	2010-2015	2015-2020	2020-2025	2025-2030	2030-2035
Singapore	77.2	90.3	98.4	99.3	101.0
Thailand	48.4	63.1	79.5	91.4	101.8
Malaysia	-3.6	5.1	24.3	34.2	43.5

In the case of Thailand the results of Scenario B are very similar to those of Scenario A, the percentage of manpower needs with respect to labor demand progressively increasing to reach a value above 100 in 2035. In the case of Malaysia local labor supply appears to be sufficient to face the growth in employment outlined in Scenario B until 2030. Finally, in Singapore manpower needs represent around 95 per cent of the increase in employment in the first period, decline to 80 per cent in the following time

interval to then increase again to almost 100 per cent during the 2030-35 period.



	2010-2015	2015-2020	2020-2025	2025-2030	2030-2035
Singapore	95.2	79.8	89.5	97.8	98.9
Thailand	44.3	57.1	74.2	88.4	102.7
Malaysia	-14.8	-16.5	-2.9	0.9	5.8

Source: Author elaboration on National data

In Singapore, scenario C produces a much more conservative forecast of Manpower needs that would be equal to only around 1.3 million for the entire period. Moreover, they would be decreasing through time in parallel with the rate of growth in employment. Also in this case, however, manpower needs will end up being in excess of the increase in employment in the 2030-35 time-interval.

6.4 A clarification of the previous results from a flow perspective

Before summarizing the conclusion suggested by the previous analysis, it is important to clarify the exact meaning of the percentages of Manpower needs we have just presented and more specifically why this percentage can exceed 100 per cent and what does it mean. In order to do so we have to move from a stock to a flow representation of the labor market. This clarification provides some relevant inputs also for the analysis of the relationship between education and vocational training, on one hand, and economic growth and development, on the other.

The increase in employment represents just one part of the number of "new" young people that are needed in any given interval by the labor market, the total number being equal to the sum of i) the people needed to substitute the employed that have definitely left the Labor force for one of the following three reasons: retirement, death, and migration, and ii) the people needed to cover the additional jobs created by the market as a consequence of the increase in production. In other terms, the Labor demand in terms of flows (LDF) (which is measured by generational entries, i.e. first time entries into employment) is equal to the sum of Replacement demand

(RD) (that is measured by the number of people needed to substitute definitive exits from employment) and Additional demand (AD) (measured by the people needed to cover the Additional jobs created in the interval).

$$3] \quad LDF = RD + AD$$

In substance, the ratio between Manpower needs and increase in employment tells us which quota of Additional demand cannot be covered by the local labor supply in terms of flows, i.e. by the people that have entered the labor market for the first time during the interval we are considering.

To exemplify the previous statements, let's consider Singapore in Scenario A. As we have already seen, in the 2010-15 period manpower needs represent 77.2 per cent of the increase in the level of employment. This means that the local labor supply in terms of flow is sufficient i) to fully replace definitive exits from the market (RD), and ii) to satisfy 22.8 per cent of the Additional demand. When we reach the 2030-35 interval, the ratio between the manpower needs and the growth in employment is equal to 101 per cent. In substance, at that time the local labor supply will not be sufficient even to fully cover Replacement demand.

7 MANPOWER NEEDS AND MIGRATION FLOWS

7.1 The stock of migrants in ASEAN countries

The presence of a structural need of migrants is by now extremely evident in Singapore, Thailand, Malaysia and Brunei. Table 12 reports the data on the stock of migrants present in ASEAN countries according to the latest United Nations estimates.

Table 12 - ASEAN countries; stock of migrants, percentage of migrants 20 and above, percentage of female migrants; 2010

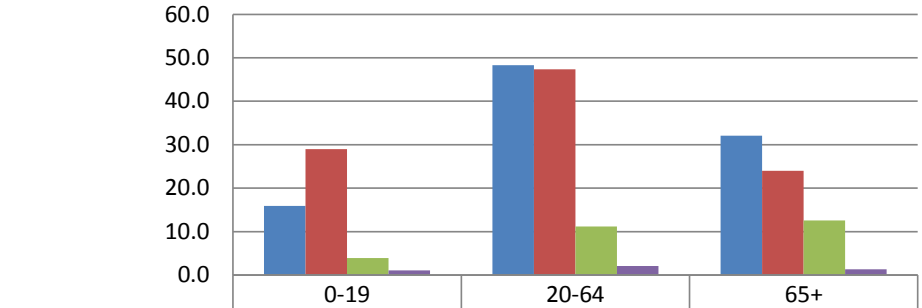
	Number of migrants		% of migrants 20 years old and above	F/T
	Abs. Value	% comp.		
Malaysia	2,358	35.2	82.0	45.2
Singapore	1,967	29.4	83.4	56.0
Thailand	1,157	17.3	81.9	48.4
Philippines	435	6.5	57.1	51.1
Cambodia	336	5.0	62.9	51.7
Brunei	148	2.2	84.7	45.5
Indonesia	123	1.8	78.3	44.5
Myanmar	89	1.3	75.8	48.7
Viet Nam	69	1.0	72.1	36.6
Laos	19	0.3	72.0	48.0
Total	6,701	100.0	79.6	49.6

Source - Author elaboration on Population Division data, 2011b

According to this source, of the 6.7 million migrants present in ASEAN 84 per cent are in the four arrival countries and, more specifically, 35.2 per cent in Malaysia, 29.4 per cent in Singapore, 17.3 per cent in Thailand and 2.2 per cent in Brunei. Since these migrations have been determined by economic reasons, the four countries are also characterized by the highest percentages (all well above 80 per cent) of migrants in working age. In Brunei and Singapore migrants (or more specifically foreign citizens in Brunei and foreign born population in Singapore) represent almost 50 per cent of the population in the 20-64 age group, the value for Malaysia being 11.2 per cent, while according to the same source in Thailand the foreign born population in this age group represent only 2 per cent of the total (Graph. 8). It is also interesting to observe that Brunei has the highest incidence of foreign elderly (a fact that signal that immigration in this country is a old phenomenon), while Singapore has the highest percentage of children showing that recent immigration is made up mainly of young people in reproductive age.

As a matter of fact available information suggests that while estimates for Singapore are sufficiently correct, the data for Thailand and Malaysia largely underestimate the number of migrants.

Graph 8 - Brunei, Singapore, Thailand and Malaysia; percentage of migrants on local population by main age group; 2010



	0-19	20-64	65+
Brunei Darussalam	15.9	48.3	32.1
Singapore	29.0	47.3	24.0
Malaysia	3.9	11.2	12.5
Thailand	1.0	2.0	1.3

Source – our elaboration on Population Division 2011b

According to the 2011 Thailand Migration Report[25], the foreign population working and residing in Thailand is in excess of 3.5 million, three times as much as the Population Division estimate[26]. This would bring

[25] "There are more than 3.5 million persons without Thai nationality living in the country, including many long-term residents and children of migrants born in Thailand. More than 3.0 million of them are working in the country; "Jerrold W. Huguet and Aphichat Chamratrithirong (eds), 2011; p. XII

[26] According to the Report: "In recent decades Thailand has evolved into a regional migration hub in South-East Asia, and is concurrently a country of origin, transit and destination for large numbers of both regular and irregular international migrants. With a dynamic economy, there is also a great deal

the percentage of the foreign population to around 4 per cent. More specifically, according to the Thai Ministry of Interior (MOI), there are a total of 2.46 million low-skilled migrants from the three neighboring countries (Myanmar, Cambodia and Laos). According to the same source, some two million migrants are currently enrolled at some stage of the country's complex registration process for migrant workers and an estimated one million migrants and family members are unregistered. Women account for around 45 per cent and children for 11 per cent of the migrant population.

For what relates to Malaysia the figure presented above refers to legal immigrants. There is however a general consensus that at present Malaysia hosts around two million migrants that should be legalized by an ongoing procedure that started in July 2011. Also in this case the number of migrants would then double with respect to the official figures.

7.2 The migration scenarios

The previous data provide the necessary background for an evaluation of the migration scenarios. As we have already suggested, the number of migrants that a country receives does depend not only on the number of jobs that cannot be covered by the local Labor force, but also on the number of dependents that will accompany, or join in a second moment, the workers. We can, at one extreme, imagine that the number of migrants will be exactly equal to the amount of workers needed by the arrival country. This situation characterizes the initial phase of the immigration process and also subsequent phases if the migration quotas set by the arrival country are not coherent with labor markets needs and, therefore, a very large number of arrivals takes place in risky, illegal situations. Subsequently, when more proper quotas are decided or workers start to be legalized and the possibility of family reunion allowed by the local legislation, the number of dependants tends to increase. It has been estimated that at present in developed countries we can expect 1.5 arrivals[27] for each job position that needs to be covered by an immigrant worker.

Since Southeast Asia countries can be considered in the initial phase of the migration process, the number of immigrants has been computed, both for Scenario A and B, on three alternative hypothesis:

i) B=1
ii) B=1.15
iii) B=1.3

Considering the six cases reported in table 13, the number of immigrants will range:

- In Singapore, from 3.6 million (B1) to 6.7 million (A3)
- In Thailand, from 10.2 million (B1) to 18 million (A3)
- In Malaysia, from a slightly negative value with positive inflows starting in 2025 (B1) to 2.2 million (A3)

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of internal migration, including circular and seasonal migration. However, the highly dynamic nature of migration trends and patterns in Thailand makes the timely formation of comprehensive and coherent migration policies very challenging."

[27] M. Bruni, 2009

Table 13 - Singapore, Thailand, Malaysia; number of migrants (thousand) in alternative scenarios of manpower needs and international labour supply reactivity; 2010-2035

	Migrants											
	Singapore	Thailand	Malaysia	Total	Singapore	Thailand	Malaysia	Total	Singapore	Thailand	Malaysia	Total
	B=1				B=1.15				B=1.3			
	Scenario A											
2010-15	535	1,452	-43	1,944	615	1,670	-50	2,235	696	1,888	-56	2,527
2015-20	768	2,043	68	2,879	883	2,350	78	3,311	998	2,656	89	3,743
2020-25	1,026	2,775	358	4,159	1,180	3,191	412	4,783	1,334	3,607	466	5,407
2025-30	1,272	3,444	559	5,275	1,462	3,960	643	6,066	1,653	4,477	727	6,857
2030-35	1,587	4,138	788	6,512	1,825	4,758	906	7,489	2,063	5,379	1,024	8,466
Total	5,188	13,851	1,730	20,769	5,966	15,929	1,990	23,885	6,744	18,007	2,249	27,000
	B=1				B=1.15				B=1.3			
	Scenario B											
2010-15	743	1,233	-160	1,815	855	1,418	-184	2,088	966	1,603	-209	2,360
2015-20	623	1,588	-178	2,032	716	1,826	-205	2,337	810	2,064	-232	2,642
2020-25	698	2,064	-32	2,730	803	2,373	-37	3,140	908	2,683	-41	3,549
2025-30	763	2,457	10	3,231	878	2,826	12	3,715	992	3,195	13	4,200
2030-35	772	2,854	62	3,688	887	3,283	72	4,242	1,003	3,711	81	4,795
Total	3,599	10,196	-298	13,497	4,139	11,726	-343	15,522	4,679	13,255	-388	17,546

Source - Author elaboration on National data

The net inflow in the three countries over the next 25 years is therefore forecasted between 13.5 (B1) and 27 million (A3). Since at this point of the game, the supply of local labor cannot be manipulated by state intervention and our Labor force forecast has been designed in such a way to represent an over-estimate, the amount of immigrants will depend on two variables: the development path chosen by each country and the growth in employment that will be generated.

We can, moreover, observe that the amount of immigrants we are forecasting is basically on line with what has happened in the last 25 years once we take into consideration that local WAP was expanding at that time, while in the next 25 it will decline.

It could be objected that the most important international Institution that provides demographic forecasts, the Population Division, has published much lower migration estimates. These data that we have reported in Table 14 deserve some comments.

Table 14 -ASEAN countries; number of migrants 1985-2010 and estimates 2010-35, medium variant scenario of the Population Division; thousand; 1985-2035

	Malaysia	Thailand	Singapore	Brunei	Indonesia	Philippines	Vietnam	Myanmar	Laos	Cambodia	ASEAN		
											Arrival countr.	Depat. countr.	Balance
1985-90	460	505	120	5	-265	-300	-330	-135	0	150	1,090	-880	210
1990-95	320	-1,110	230	5	-720	-695	-315	-125	-30	155	-555	-1,730	-2,285
1995-00	420	595	255	5	-775	-775	-285	5	-85	95	1,275	-1,820	-545
2000-05	395	1,105	230	5	-1,185	-1,130	-430	-1,000	-115	-120	1,735	-3,980	-2,245
2005-10	85	490	720	5	-1,295	-1,235	-430	-500	-75	-255	1,300	-3,790	-2,490
1985-2010	1,680	1,585	1,555	25	-4,240	-4,135	-1,790	-1,755	-305	25	4,845	-12,200	-7,355
2010-15	85	395	175	5	-1,005	-1,000	-210	-100	-75	-130	660	-2,520	-1,860
2015-20	85	390	125	5	-950	-940	-200	-50	-75	-65	605	-2,280	-1,675
2020-25	85	385	125	5	-895	-890	-200	-50	-75	-35	600	-2,145	-1,545
2025-30	85	385	120	5	-805	-800	-200	-50	-75	-10	595	-1,940	-1,345
2030-35	85	380	120	5	-720	-720	-200	-50	-75	-10	590	-1,775	-1,185
2010-2035	425	1,935	665	25	-4,375	-4,350	-1,010	-300	-375	-250	3,050	-10,660	-7,610
Diff.	-1,255	350	-890	0	-135	-215	780	1,455	-70	-275	-1,795	1,540	-255

Source - United Nations, 2011a

We observe, first of all that the Migration balance for ASEAN as a whole, with respect to the 2010-2035 period, is slightly higher in absolute value than that registered between 1985 and 2010 (-7.6 million versus -7.4 million), but the overall mobility is forecasted to decline as a result of a sharp contraction of both the inflows in arrival countries and the outflows from departures countries. The firsts decline from 4.8 million to 3 million, the seconds from 12.2 to 10.7 million. More specifically for what relates to arrival countries, inflows are expected to decline in Malaysia (-1.3 million)

and Singapore (-0.9 million), and to increase, although very marginally, in Thailand (+350,000). Outflows are expected to decline in all departure countries, but Vietnam.

In order to understand these data, we must keep in mind that they are not a forecasts based on a model or an extrapolation of past values, but a hypothesis (an educated guess) made on the basis of two considerations: 1) past international migration estimates, and 2) consideration of the policy stance of each country with regard to future international migration flows. It is also evident that in the case of Singapore and Malaysia the policy stands of the two governments have been given a bigger weight than economic considerations.

7.3 The impact of migration on total population

We have just seen that, over the next 25 years, the Population Division forecasts the arrival of 3 million migrants in Singapore, Thailand, Malaysia and Brunei, while our scenarios suggest that the value will be between 13 and 27 million, depending on the rate of employment growth. As a consequence, we also forecast very different demographic trends

It has been stated (and the demographic scenarios proposed by the Population Division endorse this statement as shown in Table 15) that the drop in fertility below replacement level that is affecting an increasing number of developed and developing countries will produce a decline in Total population, an even more pronounced decline in Working Age Population and progressive ageing phenomena that will seriously threaten the sustainability of the present level of production and of the welfare systems of these countries.

Table 15 - Singapore, Thailand and Malaysia; population by main age group; Medium variant projection; 2010 and 2060

		0-14	15-64	65+	totale
Singapore	2010	884	3,742	454	5,080
	2060	854	3,196	1,962	6,012
Thailand	2010	14,195	48,786	6,002	68,983
	2060	9,900	39,871	18,357	68,128
Malaysia	2010	8,617	18,432	1,368	28,417
	2060	8,421	29,032	7,924	45,377
Source - United Nations, 2011a					

This does necessarily happen in a closed population or in a situation in which the migration balance is not assumed (or allowed) to cover the manpower needs created by the contraction in labor supply and the expansion in demand generated by economic growth.

The demographic forecasts for Singapore and Thailand, whose fertility is already below replacement level, are in line with this position.

WAP (15-64) is expected to notably decline in both countries, while the percentage of elderly is expected to dramatically increase. The situation is obviously different for Malaysia where the TFR is still largely above replacement.

The experience of developed countries does, on the contrary, show that the end result of fertility decline is to prompt unprecedented and above replacement net migration flows that increase WAP, raise fertility, and therefore determine significant Total population growth[28].

The model we have proposed, coherently with empirical evidence, brings to the conclusion that the WAP of ASEAN arrival countries will increase, the change being directly related to the rate of growth of employment and inversely related to the rate of natural decline of local WAP (Tables A5, A7, and A9).

8 HUMAN RESOURCES AND ECONOMIC DEVELOPMENT

Education and training have always been considered a fundamental factor in promoting economic growth and social development. However, alternative growth theories have given industrial policies as well as education and vocational training different importance and role[29].

Classical growth models focus on the productivity-enhancing role of technology and human capital. They assume that investments in education and training result in skills, competences and increased capabilities of the workforce and that developing countries have the same capabilities to absorb technologies as the developed countries. The process does automatically take place through spillovers, trade and FDI, learning and increased productivity being a function of the time spent in production (learning by doing). In this context industrial policies play a very limited role, **liberalization** of the product market representing the main drive to growth. No specific educational or vocational training policies are called for to foster economic growth, education and training being only functional to match the skills supply and demand.

In the **institutional approach**[30] the key factor to reach high growth is **diversification** of the production structure, a structural transformation from low productivity, traditional (rural) activities to high productivity, (urban) modern activities, mostly, although not exclusively, in the industrial sector. Productivity grows not because of productivity increases within sectors, but as a result of shifting resources from low productivity to high productivity activities[31]. It has also been argued that the product space and the structure of goods produced determine the capabilities a country has developed, and these capabilities indicate which products or industries a country may easily develop in the future[32]. Industrial policies are, therefore, called upon to

[28] M. Bruni, 2009

[29] For the drafting of this paragraph I am strongly indebted to the following papers: I. Nubler, 2011; M. Cimoli, G. Dosi, and J.E. Stiglitz (eds), 2009, and the presentation of the same book by J. M. Salazar-Xirinachs and I. Nubler, 2010; pp 135-140.

[30] W. Lewis 1954; J. Fei and G. Ranis, 1964.

[31] D. Rodrik, 2009.

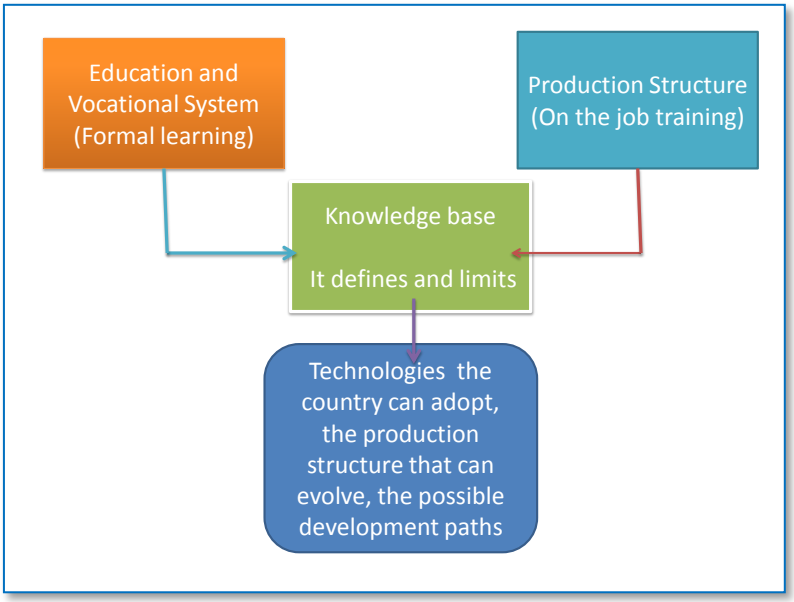
[32] C.A. Hidalgo, and R. Hausmann, 2009.

facilitate a "growth enhancing structural transformation". The challenge is getting the policy approach right by adopting an experimental and creative approach to institutional reforms[33].

According to **New evolutionary economics,** economic development is defined as a process of technological upgrading, of diversification and structural change driven, on one hand, by the accumulation of capabilities and, on the other, by the transformation of the production structure. It is the accumulation of domestic capabilities (that include the development of workers competences, the accumulation of technological and organizational know how in firms, training institutes and governments), which allows moving from the existing knowledge clusters to new knowledge clusters. [34] It is then evident that, according to this approach, not only industrial policies and educational policies can play a central role in fostering economic growth and social development, but they must be designed and implemented in a coordinated way.

In every moment of time the Labor force of a country disposes of a given **knowledge structure.** The knowledge structure is the result of past formal learning processes inside the education and vocational training system and of the training on the job provided by the production structure. In any given moment of time, the knowledge structure defines, the dynamic capabilities of an economy, i.e. determines and limits the technologies the country can adopt, the production structure that may evolve, and therefore the possible paths to economic growth and social development (Figure 1).

Figure 1



[33] It is however been suggested that: "Although this approach recognizes the role of learning and capabilities they are not integrated into the analytical framework and therefore fail to raise policy issues". I. Nubler, 2011; p.8.
[34] M. Cimoli, G. Dosi, and J.E. Stiglitz, 2009 (eds), R. Nelson (2007).

In a first phase economic development can be based upon the incremental diversification of production inside the existing knowledge clusters, i.e. producing more products that require available competences or complementary competences that can be easily acquired.

However, this is not sufficient to speed up development or to start a process of rapid catching up. In order to do so, a country must be able to shift production from low quality activities into "high quality activities", to jump into new knowledge clusters. Empirical and theoretical arguments suggest that the evolution of the knowledge base can play a fundamental role in the catching up process and that successful countries have been able to drive productive transformation by deliberately driving their knowledge structure toward higher diversity and complexity.

Some countries have been inspired by egalitarian principles and have focused on equal access to education, while others have produced polarized educational patterns**.** The countries of the first type have first increased the share of primary, then of lower and higher secondary and finally of post-secondary education. More importantly they have developed a significant share of higher and post-secondary education even at low levels of economic development. In so doing they have been able to shift production into medium technology manufacturing, then diversify production within clusters and finally move to higher technology goods[35]. The second type of countries[36] have generated an educational structure with high shares of people with no-schooling or primary education, on one hand, and of people with post secondary education, on the other. This educational structure provides options in the development of high technology products or advanced services, but limited options for the development of medium technologies. It is also evident that this kind of educational structure cannot produce a relevant economic middle class.

9 THE EDUCATIONA ATTAINMENTS OF ASEAN COUNTRIES

As we have just seen, it is the knowledge structure of the country that defines the options and the dynamic capabilities of an economy, determining which production structure can evolve. The education structure of the population can be used as a proxy of the available capabilities since it provides an indication of the technologies and of the level of complexities that the Labor force can manage.

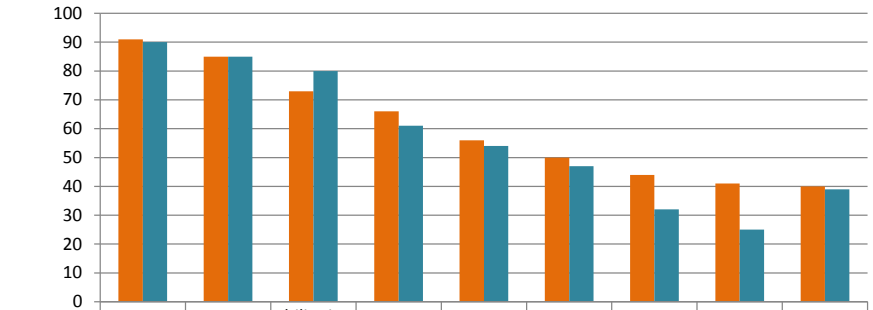
More specifically, we can assume that a country with a strong share of (young) population with lower or upper secondary education embodies strong options to shift its production structure into low and medium technology products since this educational level provides the basis for training craft people, machine operators, technician and clerks which are required by more complex manufacturing sectors. However, it is only a high share of post-secondary education that will allow developing the economic, administrative, technical competencies together with the managerial skills

[35] China and Korea belong to this group.
[36] This group includes many Latin America countries including Argentina, Brazil and Chile, but also India and Thailand.

and business leadership required to shift the economy toward medium and high technology goods and advanced services

The different levels of economic development reached by ASEAN countries have been fostered and reflect their different educational attainment. Graph 9 reports for all ASEAN countries, with the exception of Brunei[37], the percentage of men and women in the age group 15-44 with at least secondary education[38]. The ranking is lead by Singapore followed by Malaysia and Philippines. Intermediate positions are occupied by Indonesia and Thailand. At the bottom of the ranking we find Myanmar, Laos, Cambodia and Vietnam[39].

Graph 9 - ASEAN countries; men and women (15-44) with at least secondary education; percentage values; 2007



	Singapore	Malaysia	Philippines	Indonesia	Thailand	Myanmar	Laos	Cambodia	Vietnam
Men	91	85	73	66	56	50	44	41	40
Women	90	85	80	61	54	47	32	25	39

Source – IIASA 2008

Men register higher values in all countries with the only notable exception of Philippines where women percentage is 7 points higher than that of men. In Singapore, Malaysia, Thailand, Myanmar, and Vietnam the gender differential is absent or extremely low. A gender differential equal or higher than 5 percentage points is registered by Indonesia, Laos and Cambodia.

In order to better evaluate the knowledge structure of each country and the different options it opens for the future, it is important to consider separately the percentages of men and women with secondary and tertiary education (Graphs 10 and 11).

The two rankings suggest that Singapore[40] and Philippines (and in some measure also Laos) have been specializing in tertiary education, while Malaysia and Indonesia have directed their efforts mainly toward secondary

[37] The source we have used (IIASA) does not provide data for Brunei and similar data are not available at the national level.

[38] More data for men and women, in 1970 and 2007, together with mean number of year of study is reported in table 10 of the Statistical Annex.

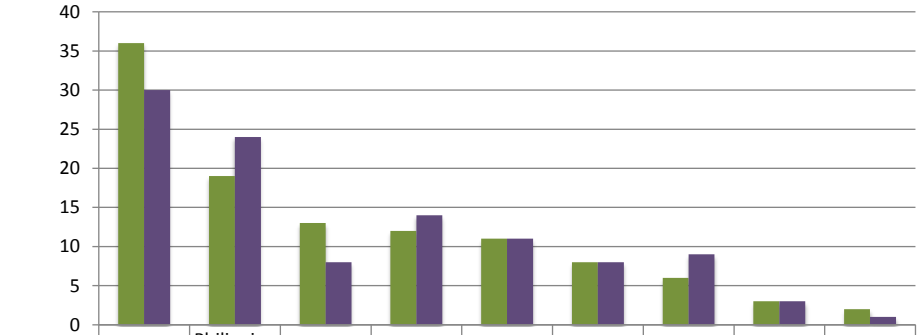
[39] The ranking of Vietnam is penalized by its gender unbiased approach to education. Laos and Cambodia are in fact characterized by a slight higher percentage of men, but by a much lower percentage of women with at least secondary education.

[40] To better evaluate the attainment of Singapore we recall that in Korea and Japan the percentages of men with tertiary education are 39 and 42 per cent.

education. Thailand and Myanmar are slightly behind, but seem to be proceeding in a balanced way, while Cambodia and Vietnam are still characterized by a heavy delay particularly relevant for tertiary education.

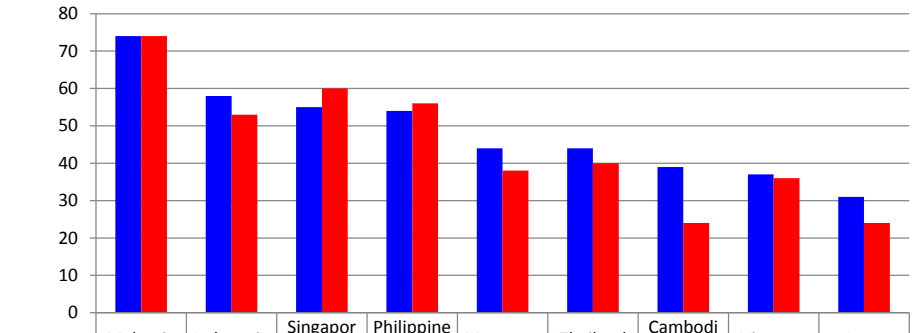
In conclusion, these data suggest that in Cambodia, Laos, and Vietnam the Labor force is still characterized by capabilities that provide options mainly in low and medium technology clusters, while Malaysia and also, although in a more limited way, Indonesia have already shifted or are ready to shift to higher technology cluster. The educational attainment of Singapore and Philippines suggests that tertiary activities are the best options for both countries that however are also equipped for high technology manufacturing clusters. Finally, Thailand and possibly Myanmar seem to have the option to operate in services and manufacturing sectors adopting intermediate technologies.

Graph 10 - ASEAN countries; men and women (15-44) with tertiary education; percentage values; 2007



	Singapore	Philippines	Laos	Thailand	Malaysia	Indonesia	Myanmar	Vietnam	Cambodia
Men	36	19	13	12	11	8	6	3	2
Women	30	24	8	14	11	8	9	3	1

Graph 11 - ASEAN countries; men and women (15-44) with secondary education; percentage values; 2007



	Malaysia	Indonesia	Singapore	Philippines	Myanmar	Thailand	Cambodia	Vietnam	Laos
Men	74	58	55	54	44	44	39	37	31
Women	74	53	60	56	38	40	24	36	24

Source – IIASA, 2008

Although not too recent, UNIDO data on competitiveness and on the share of medium-high tech value added in manufacturing give support to this analysis (Table 16). Singapore (that is world leader in competiveness) has by far the largest share of high technology products, followed in both ranking by Malaysia. The next two countries are Philippines and Thailand, followed by Indonesia. It is of interest to observe that these ranking correspond to the ranking by educational attainment.

Table 16 - ASEAN countries; Competitive Industrial Performance Index and Share of medium-high tech Value Added in manufacturing; 2007

Country	Competitive industrial Performance Index	World ranking	Country	Share of medium-high tech Value Added in Manufacturing
Singapore	0.895	1	Singapore	77.58
Malaysia	0.474	19	Malaysia	49.85
Thailand	0.407	28	Philippines	40.09
Philippines	0.400	32	Thailand	37.84
Indonesia	0.264	47	Indonesia	29.79
Viet Nam	0.193	72	Viet Nam	21.86
Cambodia	0.155	90	Cambodia	0.26
Source - UNIDO				

A final element to complete the picture of educational attainment and its future evolution is offered by public expenditure on education and its distribution by educational level (table 17). Malaysia is the country that at present devotes it largest share of GDP to education, followed by Vietnam, both countries boasting a percentage above 5 per cent. With percentages between 4 and 5 we find Indonesia and Thailand, the only two ASEAN countries that devote more than 1/5 of government expenditures to education.

To appreciate the countries' perception of their educational needs we can also observe that Cambodia, whose primary schools are affected by a very high dropout rate, are giving high priority to this educational level. A similar balanced vision of an education structure progressively built from the bottom, seems to be followed also by Indonesia and Philippine. Brunei and Malaysia are now concentrating their effort primarily on secondary education, while Singapore continues its efforts to create a highly educated work force.

Table 17 - ASEAN countries; Public expenditure on education and distribution by educational level; 2007

	Public expenditure on education as % of		Percentage of Public Expenditure by Educational Level				
	GDP	Gov. Expend.	Pre-primary	Primary	Secondary	Tetiary	Unknown
Malaysia	5.8	18.9	1	35	46	18	
Viet Nam	5.3	19.8	5	38	26	22	9
Indonesia	4.6	26.0	1	57	32		10
Thailand	4.1	20.8	7	48	16	17	13
Laos	3.3	13.2	3	46			51
Singapore	3.1	11.6	0	20	33	36	11
Philippines	2.7	16.9	2	52	27	10	10
Cambodia	2.6	12.4	1	73	21	5	
Brunei Darussalam	2.1	13.7	0	29	47	24	
Myanmar	1.3	18.1	0	48	40	12	
Source - IIASA							

10 SUMMARY AND POLICY SUGGESTIONE

10.1 The main conclusions

In the first part of the paper we have shown that the demographic revolution has already been affecting all ASEAN countries for a considerable period of time. The different intensity of economic growth, historical circumstances, prevailing values and customs have, however, interacted with demographic trends so that each country is at a different stage of this complex process. From our perspective the most interesting element is that Singapore, Thailand, Malaysia and Brunei have already been characterized by a relevant lack of labor supply that has provoked -and has been compensated by- the arrival of at least 10 million migrants, many of them from other ASEAN countries. At the same time, other migrants have left ASEAN countries, mainly Indonesia and Philippines, for non-ASEAN arrival countries.

We have also argued that in ASEAN arrival countries the need of foreign labor will progressively increase. This will depend both on the supply and on the demand side of the labor market. In the first place, the supply of local labor will necessarily decline for at least thirty, forty years. This will be caused by the decline in WAP brought about, on one hand, by the contraction in generational entries and, on the other, by the increase in generational exits. Both trends are unavoidable, being generated by structural phenomena, respectively the decline in fertility and ageing[41]. The exact dimension of the manpower needs and of the amount of migrants will, however, depend on the rate of growth of GDP that each economy will register and on the development path they will choose, which will determine the employment-income elasticity.

[41] The young people that will enter the Labor force in the next 20 years are already born and not big changes in the number of births can be forecasted in the next 10-15 years. The age structure of the Labor force is known and therefore generational exits from the labor market can also be easily estimated.

Finally, we have shown that in Singapore, Thailand and Malaysia the structural lack of labor supply:

- In the short run, cannot be counterbalanced by absorbing unemployment or increasing labor market participation, since unemployment is very low and participation very high or not expandable for cultural reasons;
- In the long run, it cannot be dealt with by delocalizing production and/or by increasing productivity, given the size and the expected duration of the phenomenon.

On the basis of the previous line of reasoning we have proposed and estimated labor market and demographic scenarios in which the migration flows and the demographic evolution of the arrival countries depend on their manpower needs. The results project a demographic future very different from that proposed by the Population Division, whose estimates appear to be more sensitive to the political stance of the interested countries than to economic logic.

The main conclusion is rather straightforward: the higher the rate of economic growth that will be attained by Singapore, Thailand, Malaysia, and Brunei, the higher their need of foreign labor, not only in absolute terms, but also as a percentage of the labor demand in terms of flow. [42] Our model shows that in a very near future the local supply of labor will not be sufficient even to offset Replacement demand. In substance, the paper supports the idea that growing workers mobility within the ASEAN community will represent an unavoidable precondition for economic growth and social development.

In the following section of the paper, a survey of the relevant literature has brought us to support the idea that economic growth is the result of a process of technological upgrading, of diversification and structural change driven by the accumulation of capabilities, on one hand, and the transformation of the production structure, on the other. In substance, according to this perspective, it is the knowledge base of a country that defines and limits the technologies a country can adopt, the production structure it may evolve, and therefore the possible paths to economic growth and social development. More specifically, speeding up economic growth and triggering successful catching up processes does require shifting production from low quality activities into "high quality activities", in other words to *jump* into new knowledge clusters. In order to do so a country needs to drive its knowledge structure toward higher diversity and complexity; in other words to endow its incoming labor force with the expertise and competences that will be required by the economic development triggered by industrial policies, and this in coordination with the necessary industrial policies.

Finally the paper has provided some information on the educational attainment of the younger components of WAP in each ASEAN country. Data show that, also in this case, ASEAN presents a very articulated reality,

[42] The labor demand in terms of flow is measured by the new entries in the labor market necessary i) to substitute the people that leave the Labor force for good and ii) to occupy the additional jobs generated by economic growth

but also a remarkable coherence between, on one hand, the educational attainment structure and, on the other, the level of development as well as the structure of the industrial and service sectors. The percentage of people between 15-44 with secondary and tertiary education spans between the maximum of Singapore (around 90 per cent) and the minimum values that characterize Laos, Cambodia, and Vietnam (between 40 and 45 per cent). Coherently, while Singapore has the world highest ranking in Industrial performance, Malaysia and Indonesia have already shifted their production structure to high quality activities and new knowledge cluster, or are ready to do so. On the other end, Cambodia and Vietnam are still attracting foreign investments mainly in labor intensive, low technology sectors.

In conclusion, the paper contends that, in a very near future, workers mobility within ASEAN will not be a choice, but a necessity imposed by demographic tendencies and economic growth. The pace of economic growth and the typology of development will determine the amount of Labor force that will be needed and the competencies and skills requested by the arrival countries. At the same time, the other ASEAN countries will have a structural excess of labor supply that will not be able to find a productive occupation in the national markets because the rate of growth requested to absorb it will remain out of reach.

It could be ASEAN goal to transform these weaknesses into strong points.

10.2 Some policy suggestions

The structural lack of labor supply that will affect Singapore, Thailand and, in a lesser measure, Malaysia can be faced only in two ways: migration and delocalization of production. The second approach, although viable from an economic perspective, can provide only a very partial solution to the expansion of production, given its risks and serious political drawbacks.

A correct migration policy can be based only upon a serious evaluation of the amount and typology of workers needed by the arrival countries[43]. It must be underlined that the more economically and socially developed economies do not need *only* skilled labor, but on the contrary - especially at the beginning of the migration process- they need *mainly* unskilled labor. The reason is quite obvious. As income per-capita increases, families will tend to provide more education to their children. The result is that the young generations that will enter the labor market in the near future in the most developed areas of ASEAN will not be willing to accept low-paid menial jobs, which remain abundant also in developed economies, especially in the service sectors. However, with time, the percentage of qualified workers and university graduates needed by these economies will progressively grow, as the percentage of migrants requested in order to face local labor demand will increase[44].

[43] Another extremely important element will be represented by a system of recognition of skill certificates and credentials within and among countries in the ASEAN region.
[44] For Singapore, see Brenda S.A. Yeoh, 2007

The other side of the coin is that migrations have both positive and negative impacts on the socio-economic systems of departure countries. On one hand, it can reduce the pressure on the supply side of the labor market and provide remittances that could, if properly directed, support productive investments. On the other hand, migration depletes the knowledge structure and the capabilities of departure countries because migrants are by definition the most dynamic elements of their societies.

As it has already been suggested, a correct approach to economic growth and catching up requires that educational policies and industrial policies be called to play a fundamental role. At national level, this implies that education and training policies should have both a short-run and a long-run objective: 1) in the short-run, provide a correct response to the local labor demand in terms of skills; 2) in the long-run, endow the incoming generations with the knowledge and the skills necessary to move the national production structure toward higher quality products. In order to avoid unemployment and frustrations, this second objective does however need a coordinated set of industrial policies that will create the demand for graduates with higher skills. In substance, education and vocational training policies should prepare the people for the production structure that is going to be promoted by industrial policies.

At ASEAN level the implication is that the educational policies of the departures countries should be coordinated also with the industrial policies of the arrival countries so that the unavoidable structural excess of labor of departures countries will find productive employment or in the arrival countries or in their investment in departures countries. These coordinated efforts will progressively lead toward a common market of the factors of production[45].

A basic element for designing and implementing the previous complex set of measures is information. Many ASEAN countries still lack the statistical information on demography, education, vocational training, labor market and migration[46] that represents the necessary prerequisite to design and implement the policies we have just outlined. Moreover, this information needs to be comparable and based upon best international practices.

This suggests that a fist important measure that could be implemented by ASEAN is the creation of an ASEAN Labor Market Information System[47]. As shown in Figure 2, a LMIS can be thought as:

- A network of producers and consumers of Labor Market Information
- A store of Labor Market Information

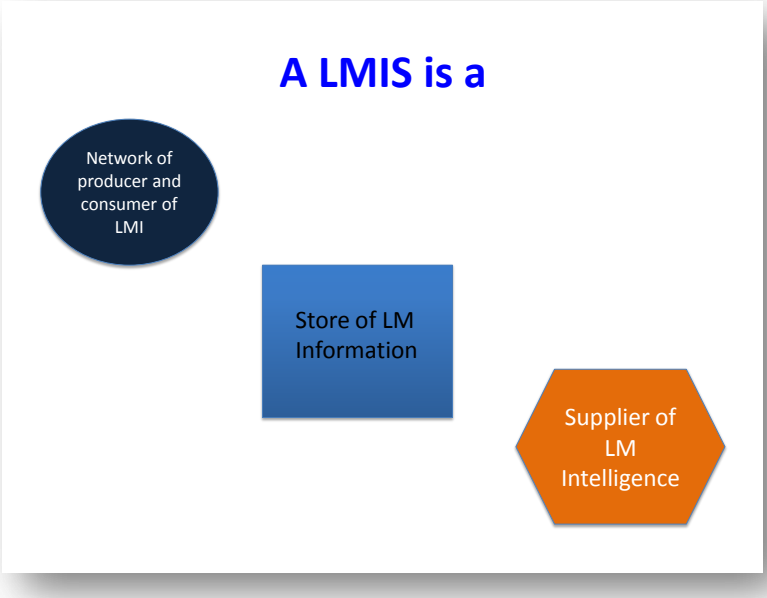
[45] Already the "**ASEAN Labor Ministers' Work Program 2000 to 2005"** stated that ASEAN countries need to enhance capacity for formulating and implementing a comprehensive and integrated human resource development (HRD) strategy on a continuous basis in order to adjust to global competition. This will include, among other things, a coordinated employment, manpower education and training programs, planning, labor policy measures and labor market information programs.

[46] The problem is fully recognized by the ALM last Work program that states: "Although human resource development planning and labor market information and analysis is a stated priority area for ASEAN, comprehensive information on the structure of ASEAN Member States' labor sectors remains of limited availability.

[47] The ASEAN LMIS would also respond to one of the priorities of the ALM work program, labor market monitoring.

- A supplier of Labor Market Intelligence

Figure 2



The first element put the accent on the fact that the ASEAN LMIS should be the expression of its stakeholders, i.e. the national producers and consumers of data. The former will provide the necessary statistical information and support their correct interpretation; the latter will indicate their needs and cooperate in directing the collection of data and the management of the system.

The second element indicates that the ASEAN LMIS should be the physical place where all the relevant national labor market information will be mapped, collected, evaluated, organized and stored.

Finally, the real justification of the ASEAN LMIS is that of providing a flow of structural and short-run analyses needed to design, implement and monitor the educational, industrial, and migration policies of ASEAN countries. Between the more relevant areas of analysis we can indicate:

- The education and vocational training systems of the ASEAN countries: in order to assess their structural characteristics and their evolution; estimate their production in terms of students outflows classified in regular and irregular, and by educational level;
- The transition process from the Educational and Vocational Training System, on one hand, and the Labor Market, on the other;
- The labor markets of the ASEAN countries in a comparative perspective;
- Internal and external migration flows.

In a more specific way the LMIS should provide the necessary inputs

- To design a framework of educational policies and industrial policies to be proposed to member countries for approval and implementation;
- To create and up-keep labor market and demographic scenarios of the type we have just shown;
- To design a map of the excess of labor supply in departures countries;
- To define the manpower needs of arrival countries, by occupations and skills.

In particular, the scenarios should provide estimates, over a 5-10 year sliding horizon, of the level and skill structure of the manpower needs of arrival countries, on one hand, and of the structural excess of labor supply of departures countries, on the other.

10.3 The Education Migration Fund

There is a final suggestion we deem relevant to advance on the eve of the creation of an integrated economic community that will progressively allow the free movement of capital and labor.

A migrant bring with him a "capital" of capabilities that is the result not only of its personal investment, but also of the public investments of its country of origin. In substance, the arrival of a migrant corresponds for the production system of the receiving country to the free acquisition of a factor of production. This is obviously true only if and when the migrant worker is needed, i.e. his services are essential and do not have a substitute in the arrival country. The paper has strongly argued that this situation will exist and persist for at last four ASEAN countries and for a number of workers largely in excess of those "forecasted" by international Institutions.

This aspect of migration has been largely overlooked by the literature because migrations are still predominantly explained from the supply side, migrants being seen as people running away from misery and deprivation, if unskilled and with low education, and as people in search of a higher income and better life, if educated and skilled. This brings to stress the cost that the countries of arrival have to bear or to promote ideas of brotherhood toward the migrants and their needs.

If we abandon this perspective to realistically accept that in an increasing number of countries labor internally produced is not sufficient to carry on and expand production, and therefore that these countries need to acquire labor from other countries in the same way as they need to acquire raw materials and capital goods, then it logically follows that arrival countries should pay for each migrant that is going to have a job position a price proportional to its education and skill level and at least equal to the cost the departure country has supported to educate and train him[48].

Keeping in mind that:

- Migrants represent a depletion of the knowledge base of the departures countries;

[48] This would also eliminate market distortion deriving from the free acquisition of factors of production by arrival countries.

- A more educated and better trained labor force is the key for economic growth;
- The need for foreign labor will dramatically increase at least for the next forty years;
- Population explosion will make more and more difficult if not impossible the development of the poorest countries in the world where the excess of labor supply will be progressively concentrated;

the creation and correct utilization of an Education Migration Fund could activate a relevant, correct, and equitable transfer of money from the rich to the poor countries to be invested in the most important factor of economic growth and social development: ***education***[49].

It is evident that even if accepted the implementation of this proposal would have to face a series of complicated issues that cannot be confronted in this paper. Here we can limit ourselves to a few suggestions.

In a global perspective we could envisage the constitution of an **Education Migration Fund** (EMF) with UNESCO that could be in charge to collect the payments from arrival countries and route them toward departure countries. This should be done in a fast and efficient way, and following a plan agreed upon with departure countries. The money should be directed to build new schools, improve the existing building, train the teachers, provide equal opportunities, and promote gender equality, in coordination with the industrial and macroeconomic policies required to start effective catching up processes.

ASEAN countries are committed to "enhance and improve the capacity of ASEAN human resources through strategic programs, and to develop a qualified competent and well-prepared ASEAN labor force that would benefit from as well as cope with the challenges of regional integration"[50]. It is evident that in the less developed countries the necessary improvement of the educational and vocational training system finds an upper limit in the existing, largely insufficient resources. The adoption of the previous proposal could provide a correct and equitable solution to this problem. Moreover it could be argued that in the growth perspective we have adopted, arrival countries would be a final beneficiary of the transfers because the same transfers would foster the process of catching up of the weaker economies, increase their level of per-capita income and therefore expand their market for foreign high quality products and services.

In this perspective ASEAN could represent an ideal testing ground of this measure. A specific working group of ASEAN experts could be entrusted with the development and implementation of the idea. Also in this case, the final goal would be the constitution of a EMF to which arrival

[49] What we propose is totally different from the so-called Bhagwati tax. In the first place, the argument advanced, almost 40 years ago by Bhagwaty and Dellafar (Bhagwati, Jagdish N., and Dellafar, 1973) calls for a tax on the incomes of "professional emigrants" from developing countries into developed countries. In the second place, the Bhagwati proposal refers only to the so called brain drain. Finally it is a typical expression of a supply side vision of the migration process. It can also be reminded that initially, also Bhagwati discussed methods for transferring income from developed countries to developing countries to compensate the latter for losses caused by the brain drain (Bhagwati and Hamada, 1974, 1975). For a more detailed discussion of the Bhagwati tax, see Wilson John Douglas, 2005

[50] ASEAN Socio-Cultural Community Blueprint

countries would transfer their payments that would then be directed toward the departure countries, in accordance with educational plans agreed upon by ASEAN and the individual countries and in coherence with the national and ASEAN training needs.

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Statistical Annex

Table A1 - Number of arrival and departure countries; emigration and immigration by continent and area; values in milion: 1950-60 and 2000-10

	N. countries	N. countries with positive migration balances	N. countries with negative migration balances	Positive migration balances	Negative migration balances	Net migration balance
	1950-1960					
Europe	40	13	26	3.0	-7.8	-4.9
New World countries	4	4		5.1		5.1
Asia	50	20	21	3.8	-2.2	1.6
South America and Carebbean	37	11	22	1.4	-1.9	-0.5
Africa	55	13	29	0.8	-2.1	-1.3
Oceania	10	1	7	0.0	0.0	0.0
Total	196	62	105	14.1	-14.1	0.0
Intercontinenatal flows, ab. value				6.7		
Intercontinenatal flows, %				47.7		
	2000-2010					
Europe	40	27	13	20.1	-1.8	18.3
New world countres	4	4	0	15.3		15.3
Asia	50	21	27	14.2	-30.6	-16.4
Gulf countries	*6*	*6*		*8.7*		
South America and Carebbean	37	8	28	0.4	-11.6	-11.2
Africa	55	16	36	3.9	-10.2	-6.3
Oceania	10	2	5	0.0	-0.2	-0.1
Total	196	78	109	53.9	-54.3	-0.4
Intercontinenatal flows, ab. value				33.7		
Intercontinenatal flows, %				62.4		

Source: our elaboration on data PD, 2011

Table. A2 -Migration balance of the first 25 arrival and departure countries; 2000-2010; thousand

Departure countries	Migration balance	Arrival countries	Migration balance
United States of America	11,150	India	-4,923
Spain	5,079	Mexico	-4,401
United Arab Emirates	3,857	Bangladesh	-4,401
Italy	3,853	China	-4,182
Saudi Arabia	2,781	Pakistan	-3,750
Russian Federation	2,700	Indonesia	-2,477
Canada	2,187	Philippines	-2,361
United Kingdom	1,989	Zimbabwe	-1,600
Australia	1,786	Myanmar	-1,500
Thailand	1,595	Peru	-1,350
South Africa	1,400	Morocco	-1,289
Germany	1,319	Uzbekistan	-1,274
France	1,266	Brazil	-1,000
Qatar	1,027	Côte d'Ivoire	-870
Singapore	954	Viet Nam	-863
Afghanistan	585	Iraq	-730
Burundi	570	Guinea	-725
Sierra Leone	560	Tajikistan	-718
Syrian Arab Republic	492	Egypt	-718
Malaysia	481	El Salvador	-647
Bahrain	473	United Republic of Tanzania	-645
Kuwait	439	Ethiopia	-640
Sweden	421	Somalia	-500
Belgium	396	Guatemala	-500
Austria	380	Republic of Moldova	-492
Total	47,741	Total	-42,558

Table. A3 - Asia; arrival and daparture countries; migration balance; 2000-2010; thousand			
Departure countries	Migration balance	Arrival countries	Migration balance
United Arab Emirates	3,857	India	-4,923
Saudi Arabia	2,781	Bangladesh	-4,401
Thailand	1,595	China	-4,182
Qatar	1,027	Pakistan	-3,750
Singapore	954	Indonesia	-2,477
Afghanistan	585	Philippines	-2,361
Syrian Arab Republic	492	Myanmar	-1,500
Malaysia	481	Uzbekistan	-1,274
Bahrain	473	Viet Nam	-863
Kuwait	439	Iraq	-730
Israel	377	Tajikistan	-718
Japan	322	Georgia	-459
China, Hong Kong SAR	165	Kyrgyzstan	-381
Jordan	109	Cambodia	-373
Azerbaijan	107	Sri Lanka	-350
Cyprus	106	Occupied Palestinian Territory	-280
Oman	103	Yemen	-235
China, Macao SAR	93	Kazakhstan	-214
Lebanon	88	Nepal	-200
Bhutan	52	Lao People's Democratic Republic	-190
Brunei Darussalam	7	Armenia	-175
Dem. People's Republic of Korea	0	Turkmenistan	-168
Maldives	0	Turkey	-150
Total	14,213	Republic of Korea	-128
PdG	8,681	Iran (Islamic Republic of)	-60
		Mongolia	-30
		Timor-Leste	-10
		Total	-30,583
Source: our elaboration on data PD, 2011			

Table A4 - Thailand - Labour market and demographic sceanarios 2010-35

	WAP		WAP change	Migr 5 year UNPD hypothesis)	WAP change - Migration	rate of participation	Change in LF	Rate of change in employment	Change in employment level	Employment	Total Manpower Needs (5 years)	Total Manpower Needs (yearly average)
		Scenario A										
2005	48942									35257		
2010	52856	2005-2010	3914	490	3424	72.7	2490	7.9	2780	38037	290	58
2015	55379	2010-2015	2,523	395	2,128		1,547	7.9	2,999	41,037	1,452	290
2020	57408	2015-2020	2,030	390	1,640		1,193	7.9	3,236	44,273	2,043	409
2025	58778	2020-2025	1,370	385	985		716	7.9	3,491	47,764	2,775	555
2030	59607	2025-2030	829	385	444		323	7.9	3,766	51,530	3,444	689
2035	59885	2030-2035	278	380	-102		-74	7.9	4,063	55,593	4,138	828
			7,029	1,935	5,094		3,705		17,556		13,851	554
									0.461549178		36.41538221	
	WAP		WAP change	Migr 5 year UNPD hypothesis)	WAP change - Migration Balance	rate of participation	Change in LF	Rate of change in employment over a 5 year period	Change in employment level	Employment	Total Manpower Needs (5 years)	Total Manpower Needs (yearly average)
		Scenario B										
2005	48942									35257		
2010	52856	2005-2010	3914	490	3424	72.7	2490	7.9	2780	38037	290	58
2015	55379	2010-2015	2523	395	2128		1547	7.3	2780	40818	1233	247
2020	57408	2015-2020	2030	390	1640		1193	6.8	2780	43598	1588	318
2025	58778	2020-2025	1370	385	985		716	6.4	2780	46378	2064	413
2030	59607	2025-2030	829	385	444		323	6.0	2780	49158	2457	491
2035	59885	2030-2035	278	380	-102		-74	5.7	2780	51938	2854	571
			7029	1935	5094		3705		13901		10196	408

Table A5 - Thailand; population by main age group and rate of employment in alternative scenarios of migration; 2010-2035													
Scenario A	0-14	15 +			Total population			Percentage of people 0-14			Rate of employment		
		B=1	B=1.15	B=1.30	B=1	B=1.15	B=1.30	B=1	B=1.15	B=1.30	B=1	B=1.15	B=1.30
2010	14,195	52,856	52,856	52,856	67,051	67,051	67,051	21.2	21.2	21.2	72.0	72.0	72.0
2015	13,326	56,436	56,973	57,510	69,762	70,299	70,836	19.1	19.0	18.8	72.7	72.0	71.4
2020	12,359	60,119	61,208	62,298	72,478	73,567	74,657	17.1	16.8	16.6	73.6	72.3	71.1
2025	11,592	63,879	65,532	67,185	75,471	77,124	78,777	15.4	15.0	14.7	74.8	72.9	71.1
2030	11,093	67,766	70,002	72,239	78,859	81,095	83,332	14.1	13.7	13.3	76.0	73.6	71.3
2035	10,831	71,801	74,643	77,485	82,632	85,474	88,316	13.1	12.7	12.3	77.4	74.5	71.7
Diff.	-3,364	18,945	21,787	24,629	15,581	18,423	21,265						
Scenario B													
2010	14,195	52,856	52,856	52,856	67,051	67,051	67,051	21.2	21.2	18.9	72.0	72.0	72.0
2015	13,326	56,216	56,720	57,225	69,542	70,046	70,551	19.2	19.0	18.9	72.6	72.0	71.3
2020	12,359	59,444	60,432	61,420	71,803	72,791	73,779	17.2	17.0	16.8	73.3	72.1	71.0
2025	11,592	62,493	63,938	65,384	74,085	75,530	76,976	15.6	15.3	15.1	74.2	72.5	70.9
2030	11,093	65,394	67,275	69,155	76,487	78,368	80,248	14.5	14.2	13.8	75.2	73.1	71.1
2035	10,831	68,146	70,440	72,733	78,977	81,271	83,564	13.7	13.3	13.0	76.2	73.7	71.4
Diff.	-3,364	15,290	17,584	19,877	11,926	14,220	16,513						

Table A6 - Singapore - Labour market and demographic sceanarios 2010-35

	WAP		WAP change	Migr 5 year UNPD hypothesis)	WAP change - Migration Balance	rate of participation	Change in LF	Rate of change in employment over a 5 year period	Change empl	Employment	Total Manpower Needs (5 years)	Total Manpower Needs (yearly average)
		Scenario A										
2005	3426		353	230	123							
2010	4196	2005-2010	770	720	50	74.7	37.3		781	3047	743.2	
2015	4582	2010-2015	386	175	211		158	22.7	693	3740	535	107
2020	4817	2015-2020	235	125	110		82	22.7	850	4590	768	154
2025	4965	2020-2025	148	125	23		17	22.7	1043	5634	1026	205
2030	5097	2025-2030	132	120	12		9	22.7	1281	6914	1272	254
2035	5197	2030-2035	100	120	-20		-15	22.7	1572	8486	1587	317
			1001	665	336		251		5439		5188	208

	WAP		WAP change	Migr 5 year UNPD hypothesis)	WAP change - Migration	rate of participation	Change in LF	Rate of change in employment over a 5 year	Change empl	Employment	Total Manpower Needs (5	Total Manpower Needs (yearly
		Scenario B										
2005	3426		353	230	123							
2010	4196	2005-2010	770	720	50	74.7	37.3		781	3047	743.2	
2015	4582	2010-2015	386	175	211		158	25.6	781	3828	623	125
2020	4817	2015-2020	235	125	110		82	20.4	781	4608	698	140
2025	4965	2020-2025	148	125	23		17	16.9	781	5389	763	153
2030	5097	2025-2030	132	120	12		9	14.5	781	6169	772	154
2035	5197	2030-2035	100	120	-20		-15	12.7	781	6950	795	159
			1001	665	336		251		3903		3652	146

	WAP		WAP change	Migr 5 year UNPD hypothesis)	WAP change - Migration	rate of participation	Change in LF	Rate of change in employment over a 5 year	Change empl	Employment	Total Manpower Needs (5	Total Manpower Needs (yearly
		Scenario C										
2005	3426		353	230	123							
2010	4196	2005-2010	770	720	50	74.7	37.3		781	3047	743.2	
2015	4582	2010-2015	386	175	211		158	22.7	693	3740	535	107
2020	4817	2015-2020	235	125	110		82	11.4	425	4165	343	69
2025	4965	2020-2025	148	125	23		17	5.7	237	4402	220	44
2030	5097	2025-2030	132	120	12		9	2.8	125	4527	116	23
2035	5197	2030-2035	100	120	-20		-15	1.4	64	4591	79	16
			1001	665	336		251		1544		1293	52

Table A7 - Singapore; population by main age group and rate of employment in alternative scenarios of migration; 2010-2035													
Scenario A	0-14	15 +			Total population			Percentage of people 0-14			Rate of employment		
		B=1	B=1.15	B=1.30	B=1	B=1.15	B=1.30	B=1	B=1.15	B=1.30	B=1	B=1.15	B=1.30
2010	884	4,196	4,196	4,196	5,080	5,080	5,080	17.4	17.4	17.4	72.6	72.6	72.6
2015	783	4,942	5,054	5,166	5,725	5,837	5,949	13.7	13.4	13.2	75.7	74.0	72.4
2020	772	5,820	6,064	6,307	6,592	6,836	7,079	11.7	11.3	10.9	78.9	75.7	72.8
2025	821	6,869	7,270	7,671	7,690	8,091	8,492	10.7	10.1	9.7	82.0	77.5	73.4
2030	866	8,153	8,747	9,340	9,019	9,613	10,206	9.6	9.0	8.5	84.8	79.0	74.0
2035	886	9,720	10,548	11,377	10,606	11,434	12,263	8.4	7.7	7.2	87.3	80.4	74.6
Diff.	2	5,524	6,352	7,181	5,526	6,354	7,183						
Scenario B													
2010	884	4,196	4,196	4,196	5,080	5,080	5,080	17.4	17.4	12.9	72.6	72.6	72.6
2015	783	5,030	5,155	5,280	5,813	5,938	6,063	13.5	13.2	12.9	76.1	74.3	72.5
2020	772	5,838	6,085	6,331	6,610	6,857	7,103	11.7	11.3	10.9	78.9	75.7	72.8
2025	821	6,625	6,989	7,353	7,446	7,810	8,174	11.0	10.5	10.0	81.3	77.1	73.3
2030	866	7,408	7,890	8,372	8,274	8,756	9,238	10.5	9.9	9.4	83.3	78.2	73.7
2035	886	8,184	8,782	9,380	9,070	9,668	10,266	9.8	9.2	8.6	84.9	79.1	74.1
Diff.	2	3,988	4,586	5,184	3,990	4,588	5,186						
Scenario C													
2010	884	4,196	4,196	4,196	5,080	5,080	5,080	17.4	17.4	13.2	72.6	72.6	72.6
2015	783	4,942	5,054	5,166	5,725	5,837	5,949	13.7	13.4	13.2	75.7	74.0	72.4
2020	772	5,395	5,575	5,755	6,167	6,347	6,527	12.5	12.2	11.8	77.2	74.7	72.4
2025	821	5,638	5,854	6,070	6,459	6,675	6,891	12.7	12.3	11.9	78.1	75.2	72.5
2030	866	5,766	6,001	6,237	6,632	6,867	7,103	13.1	12.6	12.2	78.5	75.4	72.6
2035	886	5,825	6,069	6,314	6,711	6,955	7,200	13.2	12.7	12.3	78.8	75.6	72.7
Diff.	2	1,629	1,873	2,118	1,631	1,875	2,120						

Table A8 - Malaysia - Labour market and demographic sceanarios 2010-35

	WAP		WAP change	Migr 5 year UNPD hypothesis)	WAP change - Migration Balance	rate of participation	Change in LF	Rate of change in employment over a 5 year period	Change empl	Employment	Total Manpower Needs (5 years)	Total Manpower Needs (yearly average)
2000	14612	**Scenario A**										
2005	16451		1839	395	1444	63.3	857		776.2	10045	-81	-16
2010	18369	2005-2010	1918	85	1833	62.7	1103.8	10.8	1084	11129	-19.8	-4
2015	20438	2010-2015	2070	85	1985		1244	10.8	1201	12330	-43	-9
2020	22537	2015-2020	2098	85	2013		1262	10.8	1331	13661	68	14
2025	24402	2020-2025	1865	85	1780		1116	10.8	1474	15135	358	72
2030	26200	2025-2030	1798	85	1713		1074	10.8	1633	16768	559	112
2035	27914	2030-2035	1714	85	1629		1022	10.8	1809	18578	788	158
			9545	425	9120		5718		7448		1730	326
									66.9254611			

Malaysia

Scenario contant employmnt growth = value last 5 years

	WAP		WAP change	Migr 5 year UNPD hypothesis)	WAP change - Migration Balance	rate of participation	Change in LF	Rate of change in employment over a 5 year period	Change empl	Employment	Total Manpower Needs (5 years)	Total Manpower Needs (yearly average)
		Scenario B										
2005	16451		1839	395	1444	63.3	857		776	10045	-81	-16
2010	18369	2005-2010	1918	85	1833	62.7	1103.8	10.8	1084	11129	-19.8	-4
2015	20438	2010-2015	2070	85	1985		1244	9.7	1084	12233	-160	-32
2020	22537	2015-2020	2098	85	2013		1262	8.9	1084	13337	-178	-36
2025	24402	2020-2025	1865	85	1780		1116	8.1	1084	14441	-32	-6
2030	26200	2025-2030	1798	85	1713		1074	7.5	1084	15545	10	2
2035	27914	2030-2035	1714	85	1629		1022	7.0	1084	16648	62	12
			9545	425	9120		5718		5420		-399	-80

Table A9 - Malaysia; population by main age group and rate of employment in alternative scenarios of migration; 2010-2035													
Scenario A	0-14	15 +			Total population			Percentage of people 0-14			Rate of employment		
		B=1	B=1.15	B=1.30	B=1	B=1.15	B=1.30	B=1	B=1.15	B=1.30	B=1	B=1.15	B=1.30
2010	8,617	18,369	18,369	18,369	26,986	26,986	26,986	31.9	31.9	31.9	60.6	60.6	60.6
2015	8,671	20,310	20,601	20,892	28,981	29,272	29,563	29.9	29.6	29.3	60.7	59.9	59.0
2020	8,674	22,392	22,995	23,598	31,066	31,669	32,272	27.9	27.4	26.9	61.0	59.4	57.9
2025	8,848	24,530	25,454	26,378	33,378	34,302	35,226	26.5	25.8	25.1	61.7	59.5	57.4
2030	8,971	26,802	28,067	29,332	35,773	37,038	38,303	25.1	24.2	23.4	62.6	59.7	57.2
2035	9,006	29,219	30,847	32,474	38,225	39,853	41,480	23.6	22.6	21.7	63.6	60.2	57.2
Diff.	389	10,850	12,478	14,105	11,239	12,867	14,494						
Scenario B													
2010	8,617	18,369	18,369	18,369	26,986	26,986	26,986	31.9	31.9	31.9	60.6	60.6	60.6
2015	8,671	20,193	20,467	20,740	28,864	29,138	29,411	30.0	29.8	29.5	60.6	59.8	59.0
2020	8,674	22,028	22,577	23,126	30,702	31,251	31,800	28.3	27.8	27.3	60.5	59.1	57.7
2025	8,848	23,776	24,587	25,398	32,624	33,435	34,246	27.1	26.5	25.8	60.7	58.7	56.9
2030	8,971	25,499	26,568	27,638	34,470	35,539	36,609	26.0	25.2	24.5	61.0	58.5	56.2
2035	9,006	27,191	28,514	29,837	36,197	37,520	38,843	24.9	24.0	23.2	61.2	58.4	55.8
Diff.	389	8,822	10,145	11,468	9,211	10,534	11,857						

Table A10 - ASEAN countries; Men and women aged 25-44; educational attainment by sex; 2007											
		Women aged 25-44					Men aged 25-44				
		No education	Primary	Secondary	Tertiary	Mean year of schooling	No education	Primary	Secondary	Tertiary	Mean year of schooling
Cambodia	1970	66	30	3	0	1.7	25	57	18	0	4.5
	2007	20	55	24	1	5	11	47	39	2	6.4
	Diff	*-46*	*25*	*21*	*1*	*3.3*	*-14*	*-10*	*21*	*2*	*1.9*
Indonesia	1970	42	38	20	0	3.9	18	51	29	2	5.6
	2007	2	37	53	8	8.6	1	33	58	8	8.9
	Diff	*-40*	*-1*	*33*	*8*	*4.7*	*-17*	*-18*	*29*	*6*	*3.3*
Laos	1970	75	23	1	0	1.2	36	48	15	2	4
	2007	28	40	24	8	5.4	15	41	31	13	7.1
	Diff	*-47*	*17*	*23*	*8*	*4.2*	*-21*	*-7*	*16*	*11*	*3.1*
Malaysia	1970	39	30	30	1	4.8	19	38	40	2	6.5
	2007	4	11	74	11	10.5	3	12	74	11	10.5
	Diff	*-35*	*-19*	*44*	*10*	*5.7*	*-16*	*-26*	*34*	*9*	*4*
Myanmar	1970	39	44	16	1	3.3	20	53	26	1	4.7
	2007	14	39	38	9	6.6	9	40	44	6	6.9
	Diff	*-25*	*-5*	*22*	*8*	*3.3*	*-11*	*-13*	*18*	*5*	*2.2*
Philippines	1970	7	50	37	7	6.8	6	49	39	6	6.9
	2007	1	19	56	24	10	2	25	54	19	9.3
	Diff	*-6*	*-31*	*19*	*17*	*3.2*	*-4*	*-24*	*15*	*13*	*2.4*
Singapore	1970	47	12	39	2	4.5	30	15	50	5	6.2
	2007	4	6	60	30	10.5	3	6	55	36	10.8
	Diff	*-43*	*-6*	*21*	*28*	*6*	*-27*	*-9*	*5*	*31*	*4.6*
Thailand	1970	23	55	21	1	5.5	15	58	25	2	6.3
	2007	4	42	40	14	9.1	3	41	44	12	9.1
	Diff	*-19*	*-13*	*19*	*13*	*3.6*	*-12*	*-17*	*19*	*10*	*2.8*
Vietnam	1970	24	61	14	0	3.8	8	65	25	2	5.5
	2007	5	56	36	3	6.4	5	54	37	3	6.5
	Diff	*-19*	*-5*	*22*	*3*	*2.6*	*-3*	*-11*	*12*	*1*	*1*
China	1970	39	32	29	1	4.5	15	39	44	2	6.7
	2007	3	23	69	5	8.6	1	16	76	7	9.3
	Diff	*-36*	*-9*	*40*	*4*	*4.1*	*-14*	*-23*	*32*	*5*	*2.6*
Japan	1970		34	60	6	8.9		32	55	13	9.4
	2007		5	50	45	13.1		7	51	42	12.8
	Diff		*-29*	*-10*	*39*	*4.2*	*0*	*-25*	*-4*	*29*	*3.4*
Korea	1970	20	36	42	2	6.3	7	26	59	7	8.7
	2007	0	3	65	32	12.4	0	3	58	39	12.9
	Diff	*-20*	*-33*	*23*	*30*	*6.1*	*-7*	*-23*	*-1*	*32*	*4.2*
Source: International Institute for Applied System Analysis; Asian and Human Capital Data, Data sheet, 2008											

Statistical Annex

Table A1 - Number of arrival and departure countries; emigration and immigration by continent and area; values in milion: 1950-60 and 2000-10

	N. countries	N. countries with positive migration balances	N. countries with negative migration balances	Positive migration balances	Negative migration balances	Net migration balance
	1950-1960					
Europe	40	13	26	3.0	-7.8	-4.9
New World countries	4	4		5.1		5.1
Asia	50	20	21	3.8	-2.2	1.6
South America and Carebbean	37	11	22	1.4	-1.9	-0.5
Africa	55	13	29	0.8	-2.1	-1.3
Oceania	10	1	7	0.0	0.0	0.0
Total	196	62	105	14.1	-14.1	0.0
Intercontinenatal flows, ab. value				6.7		
Intercontinenatal flows, %				47.7		
	2000-2010					
Europe	40	27	13	20.1	-1.8	18.3
New world countres	4	4	0	15.3		15.3
Asia	50	21	27	14.2	-30.6	-16.4
Gulf countries	*6*	*6*		*8.7*		
South America and Carebbean	37	8	28	0.4	-11.6	-11.2
Africa	55	16	36	3.9	-10.2	-6.3
Oceania	10	2	5	0.0	-0.2	-0.1
Total	196	78	109	53.9	-54.3	-0.4
Intercontinenatal flows, ab. value				33.7		
Intercontinenatal flows, %				62.4		

Source: our elaboration on data PD, 2011

Table. A2 -Migration balance of the first 25 arrival and departure countries; 2000-2010; thousand

Departure countries	Migration balance	Arrival countries	Migration balance
United States of America	11,150	India	-4,923
Spain	5,079	Mexico	-4,401
United Arab Emirates	3,857	Bangladesh	-4,401
Italy	3,853	China	-4,182
Saudi Arabia	2,781	Pakistan	-3,750
Russian Federation	2,700	Indonesia	-2,477
Canada	2,187	Philippines	-2,361
United Kingdom	1,989	Zimbabwe	-1,600
Australia	1,786	Myanmar	-1,500
Thailand	1,595	Peru	-1,350
South Africa	1,400	Morocco	-1,289
Germany	1,319	Uzbekistan	-1,274
France	1,266	Brazil	-1,000
Qatar	1,027	Côte d'Ivoire	-870
Singapore	954	Viet Nam	-863
Afghanistan	585	Iraq	-730
Burundi	570	Guinea	-725
Sierra Leone	560	Tajikistan	-718
Syrian Arab Republic	492	Egypt	-718
Malaysia	481	El Salvador	-647
Bahrain	473	United Republic of Tanzania	-645
Kuwait	439	Ethiopia	-640
Sweden	421	Somalia	-500
Belgium	396	Guatemala	-500
Austria	380	Republic of Moldova	-492
Total	47,741	Total	-42,558

Table. A3 - Asia; arrival and daparture countries; migration balance; 2000-2010; thousand			
Departure countries	Migration balance	Arrival countries	Migration balance
United Arab Emirates	3,857	India	-4,923
Saudi Arabia	2,781	Bangladesh	-4,401
Thailand	1,595	China	-4,182
Qatar	1,027	Pakistan	-3,750
Singapore	954	Indonesia	-2,477
Afghanistan	585	Philippines	-2,361
Syrian Arab Republic	492	Myanmar	-1,500
Malaysia	481	Uzbekistan	-1,274
Bahrain	473	Viet Nam	-863
Kuwait	439	Iraq	-730
Israel	377	Tajikistan	-718
Japan	322	Georgia	-459
China, Hong Kong SAR	165	Kyrgyzstan	-381
Jordan	109	Cambodia	-373
Azerbaijan	107	Sri Lanka	-350
Cyprus	106	Occupied Palestinian Territory	-280
Oman	103	Yemen	-235
China, Macao SAR	93	Kazakhstan	-214
Lebanon	88	Nepal	-200
Bhutan	52	Lao People's Democratic Republic	-190
Brunei Darussalam	7	Armenia	-175
Dem. People's Republic of Korea	0	Turkmenistan	-168
Maldives	0	Turkey	-150
Total	14,213	Republic of Korea	-128
PdG	8,681	Iran (Islamic Republic of)	-60
		Mongolia	-30
		Timor-Leste	-10
		Total	-30,583
Source: our elaboration on data PD, 2011			

Table A4 - Thailand - Labour market and demographic sceanarios 2010-35

	WAP		WAP change	Migr 5 year UNPD hypothesis)	WAP change - Migration	rate of participation	Change in LF	Rate of change in employment	Change in employment level	Employment	Total Manpower Needs (5 years)	Total Manpower Needs (yearly average)
		Scenario A										
2005	48942									35257		
2010	52856	2005-2010	3914	490	3424	72.7	2490	7.9	2780	38037	290	58
2015	55379	2010-2015	2,523	395	2,128		1,547	7.9	2,999	41,037	1,452	290
2020	57408	2015-2020	2,030	390	1,640		1,193	7.9	3,236	44,273	2,043	409
2025	58778	2020-2025	1,370	385	985		716	7.9	3,491	47,764	2,775	555
2030	59607	2025-2030	829	385	444		323	7.9	3,766	51,530	3,444	689
2035	59885	2030-2035	278	380	-102		-74	7.9	4,063	55,593	4,138	828
			7,029	1,935	5,094		3,705		17,556		13,851	554
									0.461549178		36.41538221	
	WAP		WAP change	Migr 5 year UNPD hypothesis)	WAP change - Migration Balance	rate of participation	Change in LF	Rate of change in employment over a 5 year period	Change in employment level	Employment	Total Manpower Needs (5 years)	Total Manpower Needs (yearly average)
		Scenario B										
2005	48942									35257		
2010	52856	2005-2010	3914	490	3424	72.7	2490	7.9	2780	38037	290	58
2015	55379	2010-2015	2523	395	2128		1547	7.3	2780	40818	1233	247
2020	57408	2015-2020	2030	390	1640		1193	6.8	2780	43598	1588	318
2025	58778	2020-2025	1370	385	985		716	6.4	2780	46378	2064	413
2030	59607	2025-2030	829	385	444		323	6.0	2780	49158	2457	491
2035	59885	2030-2035	278	380	-102		-74	5.7	2780	51938	2854	571
			7029	1935	5094		3705		13901		10196	408

Table A5 - Thailand; population by main age group and rate of employment in alternative scenarios of migration; 2010-2035													
Scenario A	0-14	15 +			Total population			Percentage of people 0-14			Rate of employment		
		B=1	B=1.15	B=1.30	B=1	B=1.15	B=1.30	B=1	B=1.15	B=1.30	B=1	B=1.15	B=1.30
2010	14,195	52,856	52,856	52,856	67,051	67,051	67,051	21.2	21.2	21.2	72.0	72.0	72.0
2015	13,326	56,436	56,973	57,510	69,762	70,299	70,836	19.1	19.0	18.8	72.7	72.0	71.4
2020	12,359	60,119	61,208	62,298	72,478	73,567	74,657	17.1	16.8	16.6	73.6	72.3	71.1
2025	11,592	63,879	65,532	67,185	75,471	77,124	78,777	15.4	15.0	14.7	74.8	72.9	71.1
2030	11,093	67,766	70,002	72,239	78,859	81,095	83,332	14.1	13.7	13.3	76.0	73.6	71.3
2035	10,831	71,801	74,643	77,485	82,632	85,474	88,316	13.1	12.7	12.3	77.4	74.5	71.7
Diff.	-3,364	18,945	21,787	24,629	15,581	18,423	21,265						
Scenario B													
2010	14,195	52,856	52,856	52,856	67,051	67,051	67,051	21.2	21.2	18.9	72.0	72.0	72.0
2015	13,326	56,216	56,720	57,225	69,542	70,046	70,551	19.2	19.0	18.9	72.6	72.0	71.3
2020	12,359	59,444	60,432	61,420	71,803	72,791	73,779	17.2	17.0	16.8	73.3	72.1	71.0
2025	11,592	62,493	63,938	65,384	74,085	75,530	76,976	15.6	15.3	15.1	74.2	72.5	70.9
2030	11,093	65,394	67,275	69,155	76,487	78,368	80,248	14.5	14.2	13.8	75.2	73.1	71.1
2035	10,831	68,146	70,440	72,733	78,977	81,271	83,564	13.7	13.3	13.0	76.2	73.7	71.4
Diff.	-3,364	15,290	17,584	19,877	11,926	14,220	16,513						

Table A6 - Singapore - Labour market and demographic sceanarios 2010-35

	WAP		WAP change	Migr 5 year UNPD hypothesis)	WAP change - Migration Balance	rate of participation	Change in LF	Rate of change in employment over a 5 year period	Change empl	Employment	Total Manpower Needs (5 years)	Total Manpower Needs (yearly average)
		Scenario A										
2005	3426		353	230	123							
2010	4196	2005-2010	770	720	50	74.7	37.3		781	3047	743.2	
2015	4582	2010-2015	386	175	211		158	22.7	693	3740	535	107
2020	4817	2015-2020	235	125	110		82	22.7	850	4590	768	154
2025	4965	2020-2025	148	125	23		17	22.7	1043	5634	1026	205
2030	5097	2025-2030	132	120	12		9	22.7	1281	6914	1272	254
2035	5197	2030-2035	100	120	-20		-15	22.7	1572	8486	1587	317
			1001	665	336		251		5439		5188	208

	WAP		WAP change	Migr 5 year UNPD hypothesis)	WAP change - Migration	rate of participation	Change in LF	Rate of change in employment over a 5 year	Change empl	Employment	Total Manpower Needs (5	Total Manpower Needs (yearly
		Scenario B										
2005	3426		353	230	123							
2010	4196	2005-2010	770	720	50	74.7	37.3		781	3047	743.2	
2015	4582	2010-2015	386	175	211		158	25.6	781	3828	623	125
2020	4817	2015-2020	235	125	110		82	20.4	781	4608	698	140
2025	4965	2020-2025	148	125	23		17	16.9	781	5389	763	153
2030	5097	2025-2030	132	120	12		9	14.5	781	6169	772	154
2035	5197	2030-2035	100	120	-20		-15	12.7	781	6950	795	159
			1001	665	336		251		3903		3652	146

	WAP		WAP change	Migr 5 year UNPD hypothesis)	WAP change - Migration	rate of participation	Change in LF	Rate of change in employment over a 5 year	Change empl	Employment	Total Manpower Needs (5	Total Manpower Needs (yearly
		Scenario C										
2005	3426		353	230	123							
2010	4196	2005-2010	770	720	50	74.7	37.3		781	3047	743.2	
2015	4582	2010-2015	386	175	211		158	22.7	693	3740	535	107
2020	4817	2015-2020	235	125	110		82	11.4	425	4165	343	69
2025	4965	2020-2025	148	125	23		17	5.7	237	4402	220	44
2030	5097	2025-2030	132	120	12		9	2.8	125	4527	116	23
2035	5197	2030-2035	100	120	-20		-15	1.4	64	4591	79	16
			1001	665	336		251		1544		1293	52

Table A7 - Singapore; population by main age group and rate of employment in alternative scenarios of migration; 2010-2035													
Scenario A	0-14	15 +			Total population			Percentage of people 0-14			Rate of employment		
		B=1	B=1.15	B=1.30	B=1	B=1.15	B=1.30	B=1	B=1.15	B=1.30	B=1	B=1.15	B=1.30
2010	884	4,196	4,196	4,196	5,080	5,080	5,080	17.4	17.4	17.4	72.6	72.6	72.6
2015	783	4,942	5,054	5,166	5,725	5,837	5,949	13.7	13.4	13.2	75.7	74.0	72.4
2020	772	5,820	6,064	6,307	6,592	6,836	7,079	11.7	11.3	10.9	78.9	75.7	72.8
2025	821	6,869	7,270	7,671	7,690	8,091	8,492	10.7	10.1	9.7	82.0	77.5	73.4
2030	866	8,153	8,747	9,340	9,019	9,613	10,206	9.6	9.0	8.5	84.8	79.0	74.0
2035	886	9,720	10,548	11,377	10,606	11,434	12,263	8.4	7.7	7.2	87.3	80.4	74.6
Diff.	2	5,524	6,352	7,181	5,526	6,354	7,183						
Scenario B													
2010	884	4,196	4,196	4,196	5,080	5,080	5,080	17.4	17.4	12.9	72.6	72.6	72.6
2015	783	5,030	5,155	5,280	5,813	5,938	6,063	13.5	13.2	12.9	76.1	74.3	72.5
2020	772	5,838	6,085	6,331	6,610	6,857	7,103	11.7	11.3	10.9	78.9	75.7	72.8
2025	821	6,625	6,989	7,353	7,446	7,810	8,174	11.0	10.5	10.0	81.3	77.1	73.3
2030	866	7,408	7,890	8,372	8,274	8,756	9,238	10.5	9.9	9.4	83.3	78.2	73.7
2035	886	8,184	8,782	9,380	9,070	9,668	10,266	9.8	9.2	8.6	84.9	79.1	74.1
Diff.	2	3,988	4,586	5,184	3,990	4,588	5,186						
Scenario C													
2010	884	4,196	4,196	4,196	5,080	5,080	5,080	17.4	17.4	13.2	72.6	72.6	72.6
2015	783	4,942	5,054	5,166	5,725	5,837	5,949	13.7	13.4	13.2	75.7	74.0	72.4
2020	772	5,395	5,575	5,755	6,167	6,347	6,527	12.5	12.2	11.8	77.2	74.7	72.4
2025	821	5,638	5,854	6,070	6,459	6,675	6,891	12.7	12.3	11.9	78.1	75.2	72.5
2030	866	5,766	6,001	6,237	6,632	6,867	7,103	13.1	12.6	12.2	78.5	75.4	72.6
2035	886	5,825	6,069	6,314	6,711	6,955	7,200	13.2	12.7	12.3	78.8	75.6	72.7
Diff.	2	1,629	1,873	2,118	1,631	1,875	2,120						

Table A8 - Malaysia - Labour market and demographic sceanarios 2010-35

	WAP		WAP change	Migr 5 year UNPD hypothesis)	WAP change - Migration Balance	rate of participation	Change in LF	Rate of change in employment over a 5 year period	Change empl	Employment	Total Manpower Needs (5 years)	Total Manpower Needs (yearly average)
2000	14612	**Scenario A**										
2005	16451		1839	395	1444	63.3	857		776.2	10045	-81	-16
2010	18369	2005-2010	1918	85	1833	62.7	1103.8	10.8	1084	11129	-19.8	-4
2015	20438	2010-2015	2070	85	1985		1244	10.8	1201	12330	-43	-9
2020	22537	2015-2020	2098	85	2013		1262	10.8	1331	13661	68	14
2025	24402	2020-2025	1865	85	1780		1116	10.8	1474	15135	358	72
2030	26200	2025-2030	1798	85	1713		1074	10.8	1633	16768	559	112
2035	27914	2030-2035	1714	85	1629		1022	10.8	1809	18578	788	158
			9545	425	9120		5718		7448		1730	326
									66.9254611			

Malaysia

Scenario contant employmnt growth = value last 5 years

	WAP		WAP change	Migr 5 year UNPD hypothesis)	WAP change - Migration Balance	rate of participation	Change in LF	Rate of change in employment over a 5 year period	Change empl	Employment	Total Manpower Needs (5 years)	Total Manpower Needs (yearly average)
		Scenario B										
2005	16451		1839	395	1444	63.3	857		776	10045	-81	-16
2010	18369	2005-2010	1918	85	1833	62.7	1103.8	10.8	1084	11129	-19.8	-4
2015	20438	2010-2015	2070	85	1985		1244	9.7	1084	12233	-160	-32
2020	22537	2015-2020	2098	85	2013		1262	8.9	1084	13337	-178	-36
2025	24402	2020-2025	1865	85	1780		1116	8.1	1084	14441	-32	-6
2030	26200	2025-2030	1798	85	1713		1074	7.5	1084	15545	10	2
2035	27914	2030-2035	1714	85	1629		1022	7.0	1084	16648	62	12
			9545	425	9120		5718		5420		-399	-80

Table A9 - Malaysia; population by main age group and rate of employment in alternative scenarios of migration; 2010-2035													
Scenario A	0-14	15 +			Total population			Percentage of people 0-14			Rate of employment		
		B=1	B=1.15	B=1.30	B=1	B=1.15	B=1.30	B=1	B=1.15	B=1.30	B=1	B=1.15	B=1.30
2010	8,617	18,369	18,369	18,369	26,986	26,986	26,986	31.9	31.9	31.9	60.6	60.6	60.6
2015	8,671	20,310	20,601	20,892	28,981	29,272	29,563	29.9	29.6	29.3	60.7	59.9	59.0
2020	8,674	22,392	22,995	23,598	31,066	31,669	32,272	27.9	27.4	26.9	61.0	59.4	57.9
2025	8,848	24,530	25,454	26,378	33,378	34,302	35,226	26.5	25.8	25.1	61.7	59.5	57.4
2030	8,971	26,802	28,067	29,332	35,773	37,038	38,303	25.1	24.2	23.4	62.6	59.7	57.2
2035	9,006	29,219	30,847	32,474	38,225	39,853	41,480	23.6	22.6	21.7	63.6	60.2	57.2
Diff.	389	10,850	12,478	14,105	11,239	12,867	14,494						
Scenario B													
2010	8,617	18,369	18,369	18,369	26,986	26,986	26,986	31.9	31.9	31.9	60.6	60.6	60.6
2015	8,671	20,193	20,467	20,740	28,864	29,138	29,411	30.0	29.8	29.5	60.6	59.8	59.0
2020	8,674	22,028	22,577	23,126	30,702	31,251	31,800	28.3	27.8	27.3	60.5	59.1	57.7
2025	8,848	23,776	24,587	25,398	32,624	33,435	34,246	27.1	26.5	25.8	60.7	58.7	56.9
2030	8,971	25,499	26,568	27,638	34,470	35,539	36,609	26.0	25.2	24.5	61.0	58.5	56.2
2035	9,006	27,191	28,514	29,837	36,197	37,520	38,843	24.9	24.0	23.2	61.2	58.4	55.8
Diff.	389	8,822	10,145	11,468	9,211	10,534	11,857						

Table A10 - ASEAN countries; Men and women aged 25-44; educational attainment by sex; 2007											
		Women aged 25-44					Men aged 25-44				
		No education	Primary	Secondary	Tertiary	Mean year of schooling	No education	Primary	Secondary	Tertiary	Mean year of schooling
Cambodia	1970	66	30	3	0	1.7	25	57	18	0	4.5
	2007	20	55	24	1	5	11	47	39	2	6.4
	Diff	*-46*	*25*	*21*	*1*	*3.3*	*-14*	*-10*	*21*	*2*	*1.9*
Indonesia	1970	42	38	20	0	3.9	18	51	29	2	5.6
	2007	2	37	53	8	8.6	1	33	58	8	8.9
	Diff	*-40*	*-1*	*33*	*8*	*4.7*	*-17*	*-18*	*29*	*6*	*3.3*
Laos	1970	75	23	1	0	1.2	36	48	15	2	4
	2007	28	40	24	8	5.4	15	41	31	13	7.1
	Diff	*-47*	*17*	*23*	*8*	*4.2*	*-21*	*-7*	*16*	*11*	*3.1*
Malaysia	1970	39	30	30	1	4.8	19	38	40	2	6.5
	2007	4	11	74	11	10.5	3	12	74	11	10.5
	Diff	*-35*	*-19*	*44*	*10*	*5.7*	*-16*	*-26*	*34*	*9*	*4*
Myanmar	1970	39	44	16	1	3.3	20	53	26	1	4.7
	2007	14	39	38	9	6.6	9	40	44	6	6.9
	Diff	*-25*	*-5*	*22*	*8*	*3.3*	*-11*	*-13*	*18*	*5*	*2.2*
Philippines	1970	7	50	37	7	6.8	6	49	39	6	6.9
	2007	1	19	56	24	10	2	25	54	19	9.3
	Diff	*-6*	*-31*	*19*	*17*	*3.2*	*-4*	*-24*	*15*	*13*	*2.4*
Singapore	1970	47	12	39	2	4.5	30	15	50	5	6.2
	2007	4	6	60	30	10.5	3	6	55	36	10.8
	Diff	*-43*	*-6*	*21*	*28*	*6*	*-27*	*-9*	*5*	*31*	*4.6*
Thailand	1970	23	55	21	1	5.5	15	58	25	2	6.3
	2007	4	42	40	14	9.1	3	41	44	12	9.1
	Diff	*-19*	*-13*	*19*	*13*	*3.6*	*-12*	*-17*	*19*	*10*	*2.8*
Vietnam	1970	24	61	14	0	3.8	8	65	25	2	5.5
	2007	5	56	36	3	6.4	5	54	37	3	6.5
	Diff	*-19*	*-5*	*22*	*3*	*2.6*	*-3*	*-11*	*12*	*1*	*1*
China	1970	39	32	29	1	4.5	15	39	44	2	6.7
	2007	3	23	69	5	8.6	1	16	76	7	9.3
	Diff	*-36*	*-9*	*40*	*4*	*4.1*	*-14*	*-23*	*32*	*5*	*2.6*
Japan	1970		34	60	6	8.9		32	55	13	9.4
	2007		5	50	45	13.1		7	51	42	12.8
	Diff		*-29*	*-10*	*39*	*4.2*	*0*	*-25*	*-4*	*29*	*3.4*
Korea	1970	20	36	42	2	6.3	7	26	59	7	8.7
	2007	0	3	65	32	12.4	0	3	58	39	12.9
	Diff	*-20*	*-33*	*23*	*30*	*6.1*	*-7*	*-23*	*-1*	*32*	*4.2*
Source: International Institute for Applied System Analysis; Asian and Human Capital Data, Data sheet, 2008											

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Executive summary

ASEAN countries have been moving at different speeds along the path of the so called Demographic transition and are at present at different stages of this complex process. As a consequence, starting in the very near future, some ASEAN countries will be affected by an increasing structural lack of labor supply, while in other a structural excess of labor supply will persist for at least 30-40 years. This situation has already contributed to divide ASEAN countries into two groups: departure countries and arrival countries. Data show that both departures and arrivals have been steadily increasing as well as labor mobility within ASEAN.

Building on this demographic background, the paper proposes alternative labor market and demographic scenarios for the period 2010-35. The scenarios outline manpower needs, migration flows and population growth on the basis of the trends in WAP and alternative hypothesis on employment growth. The main conclusion is that the higher the rate of economic growth that will be attained by Singapore, Thailand, Malaysia, and Brunei (already relevant arrival countries), the higher their need of foreign labor. In fact, in a very near future the local labor supply of these countries will not be even sufficient to replace the workers that will leave for good the labor force due to retirement or death. In substance, the paper supports the idea that growing workers mobility within ASEAN countries will represent an unavoidable precondition for economic growth and social development.

A survey of economic growth model brings us to support the idea that economic growth is the result of a process of technological upgrading, of diversification and structural change driven by the accumulation of capabilities, on one hand, and the transformation of the production structure, on the other. It is the knowledge base of a country that defines and limits the technologies a country can adopt, the production structure that may evolve, and therefore the possible paths to economic growth and social development. Speeding up economic growth and triggering successful catching up processes does require shifting production from low quality activities into "high quality activities", to "jump" into new knowledge clusters. In order to do so a country also needs to drive the knowledge structure toward higher diversity and complexity, to endow its incoming labor force with new expertise and competences.

The different levels of economic development reached by ASEAN countries have been fostered and reflect their different knowledge base. The percentage of people between 15-44 with secondary and tertiary education spans between the maximum of Singapore (91 per cent) and the minimum values that characterize Laos, Cambodia, and Vietnam (between 40 and 45 per cent). A more detailed analysis of the national educational attainments shows that beside Singapore -that has the world highest ranking in Industrial performance- only Malaysia and Indonesia have already shifted their production structure to high quality activities and new knowledge cluster or are ready to do so. The more polarized education structure of Thailand and possibly Myanmar suggest that these two countries have limited options to

start the production of intermediate technology products, but could develop directly toward high technology sectors.

In conclusion, the paper contends that in a very near future workers mobility within the ASEAN region will not be a choice, but a necessity imposed by demographic tendencies and economic growth. The pace of economic growth and the typology of development will determine the amount of labor force that will be needed and the competencies and skills that will be required by arrival countries. At the same time, the other ASEAN countries will be characterized by a structural excess of labor supply that will not be able to find a productive occupation in the national markets, since the rate of economic growth requested to absorb it will remain out of reach.

It could be ASEAN goal to transform these weaknesses into strong points.

The structural lack of labor supply that will affect Singapore, Thailand and, although in a lesser measure, Malaysia can be faced only in two ways: migration and delocalization of production. The second approach, although viable from an economic perspective, can provide only a very partial solution to the expansion of production, given its risks and serious political drawbacks.

In this situation the papers proposes a series of policy options.

In the first place, a correct migration policy can be based only upon a serious evaluation of the amount and typology of workers needed by arrival countries. The paper stresses the fact that the more developed economies do not need only skilled labor, but on the contrary -especially at the beginning of the migration process- they need mainly unskilled labor and only with time qualified workers and university graduates will become predominant.

The other side of the coin is that the outflow of migrants presents both positive and negative aspects for departure countries. On one hand, it reduces the pressure on the labor market and provides remittances that could support productive investments. On the other hand, it depletes the knowledge structure and the capabilities of the departure countries because migrants are always, by definition, the most dynamic element of their societies.

A correct approach to economic growth and catching up suggests that educational policies and industrial policies can play a fundamental role. In order to do so educational policies must be designed and implemented in relations to the training needs of both departures and arrival countries, while industrial policies should provide a production structure capable of promoting economic growth and a labor demand coherent with the exits from the educational system.

More specifically, at national level, education and training policies should: 1) in the short run, provide a correct response to the local labor demand in terms of skills; 2) in the long run, endow the incoming generations with the knowledge and the skills necessary to move the national production structure toward higher quality products. Moreover, the

educational policies of the departures countries should be coordinated also with the industrial policies of the arrival countries so that the structural excess of labor supply of departures countries will find productive employment or in the arrival countries or in their investment in departures countries.

In order to face such complex set of task, ASEAN countries will need, as already clearly suggested by the last ALM Working Program, a Labor Market Information System providing comparable information on the main aspects of human resources management, from demography to education and vocational training, from macroeconomic to employment, unemployment and migration, together with a broad comparative view of their labor market legislation.

Therefore, an extremely important objective of ASEAN could be the constitution of an **ASEAN Labor Market Information System** aimed to collects, store and analyze the data produced at the national level, better their quality, and promote their comparability.

The paper proposes a second important measure that responds not only to principles of equity and competitiveness but could also foster economic growth and social development: the creation of an **Employment Migration Fund**.

A migrant brings with him a set of capabilities that are the result not only of its personal investment, but also of the investment in education made by its country of origin. In substance, the arrival of a migrant corresponds for the production system of the receiving country to the free acquisition of a factor of production. This is obviously true only if and when the migrant worker is needed, i.e. his services are essential and do not have a substitute in the arrival country. The paper has strongly argued that this situation will exist and persist for at last four ASEAN countries and will affect a number of workers largely in excess of those "forecasted" by international Institutions.

This aspect of migration has been largely overlooked by the literature because migrations are still predominantly explained from the supply side, migrants being represented as people running away from misery and deprivation or just looking for higher wages and a better life. This perspective has brought to the proposal, almost 40 years ago, of the so-called Bhagwati tax.

If we abandon this point of view and more in tune with reality and empirical evidence we realize that many developed economies that have been affected already for long time by below replacement fertility do not have enough internally "produced" labor not only to expand, but even to keep the present level of production, then we have also to change our image of the migrants.

The first obvious implication is that the arrival country should pay to the departure country for each migrant employed in a productive job a price proportional to the cost supported by the government of the country of origin for its education and training.

The proposal is that these contributions be collected in an **Education Migration Fund** managed by ASEAN to be used only to improve the

education and training system of member countries by intervening on the infrastructures, training the teachers, providing equal opportunities, and promoting gender equality, in coordination with the industrial and macroeconomic policies required to start effective catching up processes.

This measure would not only respond to a principle of equity, eliminate market distortions deriving from the free acquisition of factors of production by arrival countries, but in the growth perspective we have introduced, it would also be beneficial to arrival countries by fostering the process of catching up of the weaker economies, increasing their level of income and therefore expanding the market for the products coming from the more developed neighbors.

JEL Classification: F22, I25, J11, J24, 053

Keywords: ASEAN; Labor market; Demography; Scenarios; Migration; Education; Growth

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We shall work closely with workers, employers, civil society, and other organizations to provide a favorable environment for economic growth and employment creation, as a key strategy to accelerate economic recovery and growth.

We shall give priority to capacity-building in order to develop a productive, competent, and competitive workforce. This will enable the people of ASEAN to meet the changing job demands and challenges in the face of the integration of regional and global labor markets.

ASEAN Labor Ministers' Vision Statement, 2000

1 INTRODUCTION [1]

1.1 The Institutional background

ASEAN countries are committed to "enhance and improve the capacity of ASEAN human resources through strategic programs, and to develop a qualified competent and well-prepared ASEAN labor force that would benefit from as well as cope with the challenges of regional integration"[2].

Since 2000, ASEAN's activities on labor and human resources have been guided by ASEAN Labor Ministers (ALM) Work Programs. The first Work Program set five broad priorities in the areas of employment generation, labor market monitoring, labor mobility, social protection, and tripartite cooperation. In the ALM Joint Statement of 2006 a sixth priority area, namely occupational safety and health (OSH), was added to in the Work Program. Since then new areas of work have emerged, including protection and promotion of the rights of migrant workers, HIV prevention and control in the work place, employment and labor law, as expressed in the ASEAN community blueprints.

A *Ad-hoc Working Group on Progressive Labor Practices to Enhance the Competitiveness of ASEAN* was established in 2006. In 2009, the ASEAN leaders adopted the Cha Am Hua Hin Declaration on Strengthening Cooperation on Education to Achieve a Caring and Sharing Community. The 17th ASEAN summit, held in Hanoi in 2010, focused on skills development and life-long learning. In that occasion the Leaders of ASEAN adopted a *Joint Statement on Human resources and Skills Development for Economic Recovery and Growth*.

The Joint Statement affirmed that: "HR development should be an integral part of a country's development strategy", the rational being that "Human resources development correlates with productivity and higher productivity leads to higher economic growth." It suggested that in the

[1] The paper has been written in the context of the project STVET (Strengthening Technical Vocational Education and Training) of the Ministry of Labor and Vocational Training (MOLVT) financed by the Asian Development Bank (ADB Grant Number: 0178-CAM) in which the author acted as Labor Market Information and Statistic Specialist. The views and opinions expressed in the paper are strictly those of the author.

[2] ASEAN Socio-Cultural Community Blueprint.

medium-and long-term regional countries should take measures, among others, to upgrade the quality of the workforce through improving the relevance and quality of education and training. It further suggested that the gradual shift from an export-oriented economy to a more internal consumption base economy that many ASEAN countries will experience will need a greater capacity to rapidly intervene in the development of HR. Finally it reminded that the social dialogue between employers and employees should be strengthened to better the matching between the skill needed by the employers and the training provided to the workers. The document concluded stating that the " ... globalization, technological development and demographic change have added a sense of urgency to improving quality of HR as they change the workplace, the nature and organization of work."

According to the last ALM Work Program covering the period 2010-2015: " The overall objective of ASEAN cooperation on labor is to build towards the vision of a better quality of life, productive employment, and adequate social protection for ASEAN peoples through enhancing workforce competitiveness, creating a harmonious and progressive workplace, and promotion of decent work for all." The work plan indicates four strategic priorities: i) Legal foundation; ii) Institutional capacity; iii) Social partners; iv) Labor market and workforce development.

The first priority implies the protection of labor right and conditions, including those of migrant workers; the second the capacity of the Government bodies to oversee the enforcement of labor laws and regulation; the third the establishment of informed social dialogue among labor sector partners at the national and regional level. The fourth priority includes a set of goals that will be at the center of the present paper:

1. Creating systems that will promote the mobility of skilled labor within ASEAN;
2. Anticipating, analyzing, monitoring and communicating to labor sector stakeholders and the public the impact of trade liberalization and of other global economic challenges on employment, wages, working condition, skills demand, etc.;
3. Promoting progressive labor practices with regard to workforce development, skills training and standards, labor productivity, and labor law in order to enhance the competitiveness of firms and workforces, and thus of the ASEAN Member States and the region overall;
4. Generating, regularly updating, and effectively disseminating labor market information.

1.2 The structure of the paper

The paper is structured in four parts. The first part analyses the impact of the Demographic transition (that we will prefer to call Demographic revolution) on the demographic tendencies and indicators of ASEAN countries. It will document the fact that the members of ASEAN have proceeded at different speeds along the path of the Demographic revolution

and have reached different stages of this complex process. As a consequence, while some countries are already (or will be soon) characterized by a declining Working Age Population (WAP), in other WAP will continue to grow. This will create a structural lack of labor supply in some countries and an excess of labor supply in the others.

In the second part of the paper a model is introduced that allows estimating manpower needs, migration flows, and population trends as a function of the evolution in WAP and alternative hypothesis on employment growth. The model is used to build alternative labor market and demographic scenarios for ASEAN arrival countries. The exercise clearly shows that the future economic growth of Singapore, Thailand, and Malaysia will hinge on the arrival of very relevant numbers of foreign workers. The results are discussed on the basis of the tendencies exhibited in previous periods by migration flows in the Asian continent and more specifically in ASEAN countries and of a critical appraisal of the projections made by the United Nations Population Division.

The third part of the paper discusses alternative growth theories and their implications in terms of industrial and educational policies. It will be shown that according to the New evolutionary economics, growth is lead by the accumulation of capabilities that allows, in a first phase, to diversify production inside a given knowledge cluster, and then to jump to new knowledge clusters, i.e. to move to higher quality products.

The fourth part of the paper reviews the educational attainments of ASEAN countries. It then discusses the relationship between their education structure and the stage of growth they have reached and outlines their present options for technology and product diversification.

The conclusion will bring together the main results reached in the four parts of the paper and spell out a series of policy suggestions.

2 THE DEMOGRAPHIC BACKGROUND

In 1950 the total population of ASEAN countries amounted to around 172 million; after 60 years it reached almost 593 million and by now it should have passed the 600 million mark[3]. The average growth of 7 million per year registered in this long time interval is the result of 11 million births, 4 million deaths, and of around 150,000 net migrants per year (Table 1).

[3] Percentage rates of growth above the regional average (243.7 per cent) have been registered by the four smallest countries (Brunei, Singapore, Laos and Malaysia), together with Philippines, that register an astonishing demographic growth of 407%. As a consequence, Philippines are now the second most populous country in ASEAN after Indonesia that remains the most populous one with 240 million inhabitants, but ahead of Vietnam and Thailand.

Table 1 - ASEAN countries; population, births, deaths and migration balance; absolute values; 1950 - 2010

	Population 1950	Birth	Death	Natural Balance	Migration balance	Total balance	Population 2010
Brunei	47	345	35	310	496	806	853
Cambodia	4,346	18,650	8,055	10,595	-803	9,792	14,138
Indonesia	74,838	271,095	101,475	169,620	-4,590	165,030	239,868
Laos	1,683	7,910	2,850	5,060	-540	4,520	6,203
Malaysia	6,112	26,105	5,670	20,435	1,855	22,290	28,402
Myanmar	17,156	58,600	25,970	32,630	-1,810	30,820	47,976
Philippines	18,395	102,395	22,400	79,995	-5,135	74,860	93,255
Singapore	1,025	3,010	815	2,195	1,865	4,060	5,085
Thailand	20,608	67,210	21,340	45,870	2,615	48,485	69,093
Vietnam	28,263	101,205	38,440	62,765	-3,170	59,595	87,858
Total	172,473	656,525	227,050	429,475	-9,218	420,258	592,731
Yearly average		10,942	3,784	7,158	-154	7,004	
Source - United Nations, 2011a							

Rather surprisingly, these long-run yearly average values are almost identical to those of the 2005-2010 period, the only notable difference being represented by the average number of net migrants that has soared to almost half a million (Table 2).

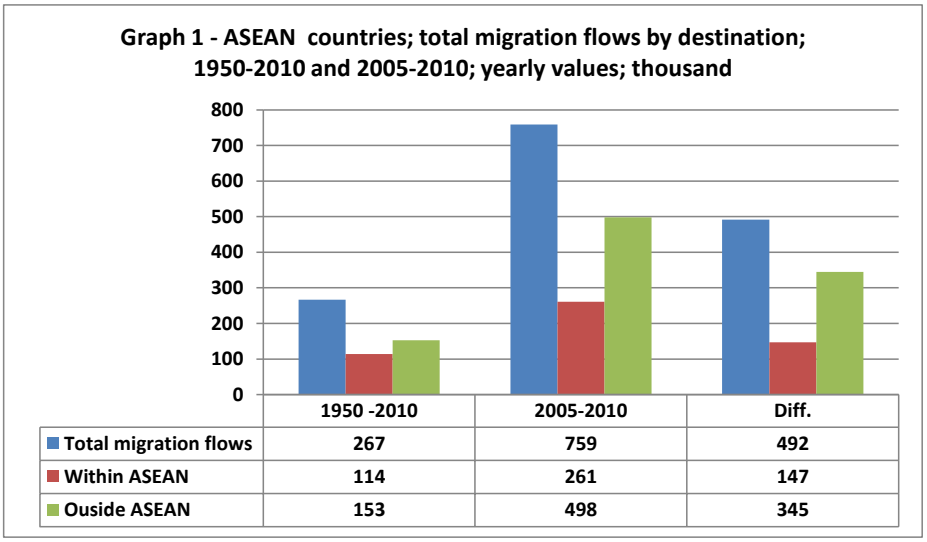
Table 2 - ASEAN countries; population, births deaths and migration balance; absolute values; 2005-2010

	Population 2005	Birth	Death	Natural Balance	Migration balance	Total balance	Population 2010
Brunei	809	40	5	35	9	44	853
Cambodia	13,358	1,605	565	1,040	-260	780	14,138
Indonesia	227,303	22,320	8,460	13,860	-1,295	12,565	239,868
Laos	5,753	720	195	525	-75	450	6,203
Malaysia	26,097	2,855	635	2,220	85	2,305	28,402
Myanmar	46,331	4,230	2,085	2,145	-500	1,645	47,976
Philippines	85,540	11,590	2,640	8,950	-1,235	7,715	93,255
Singapore	4,270	205	110	95	720	815	5,085
Thailand	66,668	4,365	2,430	1,935	490	2,425	69,093
Vietnam	83,168	7,360	2,240	5,120	-430	4,690	87,858
Total	559,297	55,290	19,365	35,925	-2,491	33,434	592,731
Yearly average		11,058	3,873	7,185	-498	6,687	
Source - United Nations, 2011a							

Between 1950 and 2010 the largest migration flows were originated by Philippines (more than 5 million), followed by Indonesia (4.6 million), Vietnam (3.2 million), Myanmar (1.8 million), Cambodia (0.8 million) and Laos (0.5 million). Positive migration balances were registered by Thailand (2.6 million), Malaysia and Singapore, with 1.8 million each, and Brunei with 0.5 million[4]. Therefore, in 60 years six ASEAN countries have generated a little more than 16 million migrants (267,000 per year); of these 6.8 million (42.6 per cent) have

[4] The realism of these values will be discussed in a later paragraph.

moved to other ASEAN countries[5]), while 9.2 million have left the ASEAN region (57.4 per cent).



	1950 -2010	2005-2010	Diff.
Total migration flows	267	759	492
Within ASEAN	114	261	147
Ouside ASEAN	153	498	345

Source - Author elaboration on United Nations data, United Nations, 2011a

In the last 5 years, the yearly average number of migrants has grown to 759,000, 261,000 of which headed toward some ASEAN countries, while the other 498,000 left the region (Graph.1). The departure countries have remained the same, but out-migration is now very concentrated, with Indonesia and Philippines accounting respectively for 34.1% and 32.5% of the total. At the same time two countries, Singapore and Thailand, accounted for 92.8 per cent of the total positive migration balance. It must also be underlined that the percentage of migrants that have moved within ASEAN has diminished from 42.7 per cent over the total period to 34.4 per cent in the last 5-year period.

The demographic boom registered by all ASEAN countries has been the result of the so-called "demographic transition" that is also going to have a very strong impact on their demographic future. The demographic transition has been defined as the passage from a traditional demographic regime, characterized by high fertility and high mortality, to a modern demographic regime, characterized by low fertility and low mortality. The drop in fertility below replacement level that by now has already taken place in around 50 developed and developing countries puts in serious doubt that what we are witnessing is a transition, i.e. the passage from an equilibrium regime to another equilibrium regime. Therefore, from now on we will use the terminology demographic revolution that is much more suggestive of the creative demographic disorder that is presently affecting the world.

In 1950-55, in all ASEAN countries, the Total Fertility Rate (TFR) – that we can loosely define as the total number of children per woman- was well above world average (4.95) (Table 3). Only two countries, Laos and Indonesia, registered a TFR below 6, while in the Philippines the TFR was

[5] In this context, it should be underlined that 62% of the extraordinary demographic growth of Brunei is due to immigration.

above 7 and in Brunei exactly 7. In the other six countries the TFR ranged from 6.61, registered by Singapore, and 6 registered by Myanmar. After 60 years only Philippines and Laos register TFR above 3 and four countries (Myannar, Vietnam, Thailand and Singapore) are already below replacement level[6], while Indonesia and Brunei could reach this historical borderline during the present decade. In all these countries the TFR has dimished by more than 60%, with record values registered by Singapore (-81.1%) and Thailand (-73.5%).

Table 3 - ASEAN countries; total fertility rate; 1950-55 and 2005-10

	1950-55	2005-10	Abs. change	% change
Philippines	7.42	3.27	4.15	55.9
Laos	5.94	3.02	2.92	49.2
Cambodia	6.29	2.80	3.49	55.5
Malaysia	6.23	2.72	3.51	56.3
Indonesia	5.49	2.19	3.30	60.1
Brunei	7.00	2.11	4.89	69.9
Myanmar	6.00	2.08	3.92	65.3
Vietnam	6.20	1.89	4.31	69.5
Thailand	6.14	1.63	4.51	73.5
Singapore	6.61	1.25	5.36	81.1
Source - United Nations, 2011a				

A declining trend has characterized also mortality. Life expectancy has increased in all ASEAN countries, the most spectacular results having being achieved by Vietnam and Indonesia whose life expectancy at birth has increased respectively by 6.8 and 5.8 months per year. The spread between the maximum value (80.6, Singapore) and the minimum value (61.5, Cambodia) remains, however, very large[7] (Table 4).

Table 4 - ASEAN countries; life expectancy at birth; 1950 and 2010; years

	1950	2010	Absolute change (years)	Average yearly increase (months)
Cambodia	39.4	61.5	22.1	4.4
Myanmar	36.0	63.5	27.5	5.5
Laos	42.4	66.1	23.7	4.7
Philippines	55.4	67.8	12.4	2.5
Indonesia	38.8	67.9	29.1	5.8
Malaysia	55.4	73.4	18.0	3.6
Thailand	50.7	73.6	22.9	4.6
Vietnam	40.4	74.3	33.9	6.8
Brunei	57.7	77.5	19.8	4.0
Singapore	60.2	80.6	20.4	4.1
Max - Min	-18.3	-19.1	0.8	0.2
Source - United Nations, 2011a				

[6] The replacement level is the level at which total population remains constant and is approximately 2.1children per woman

[7] The main determinant of this large difference is represented by infant mortality.

These data do clearly show that ASEAN countries have been moving along the path of the demographic revolution at different speed, due to the political, economic and social events that have characterized their history in the second half of the XX century and in the beginning of the XXI century. The different position of each ASEAN country along the path of the demographic revolution can be captured and further documented with the help of other demographic indicators such as the Infant mortality rate and the structure of population by main age group.

The Infant mortality rate (IMR) plays a very important role in determining the level and the trend of life expectancy at birth (Table 5). In 1950, the Infant mortality rate (the number of children that die before reaching one year of age per thousand) presented a wide range of values that were reflected by life expectancy data. The most dramatic situation was that of Myanmar, where more than one child out of 5 died before age one; Singapore presented the best situation, but also in Singapore 1 child out of 16 died before age one.

Table 5 -ASEAN countries; Infant mortality rate; 1950 and 2010

	2010	1950	Dff.
Singapore	1.9	60.7	-58.8
Brunei	4.8	90.2	-85.4
Malaysia	7.7	96.4	-88.7
Thailand	12.4	130.3	-117.9
Vietnam	20.4	157.9	-137.5
Philippines	23.0	96.8	-73.8
Indonesia	28.8	191.9	-163.1
Laos	44.5	167.1	-122.6
Myannar	55.0	212.8	-157.8
Cambodia	62.4	165.1	-102.7
Max-Min	60.5	152.1	-91.6

Source - United Nations, 2011a

In the following 60 years, all ASEAN countries have made substantial improvements so that the worst-case scenario registered in 2010 is similar to the best-case scenario in 1950. Infant mortality has been completely eradicated in Singapore, and values of the IMR below 10 per thousand are registered in Brunei and Malaysia, with Thailand at 12.4. Vietnam, Philippines and Indonesia present values between 20 and 30, Vietnam and Indonesia being between the countries that have accomplished the biggest improvements, and Philippines the one with the worst performance. Laos, Myanmar, and Cambodia occupy the last three positions in the ranking.

In a first phase, the demographic revolution generates waves of births of increasing magnitude and then waves of declining magnitude. The passage of time makes each cohort move orderly along the path of life,

determining first a huge expansion of the proportion of children and then an increasing proportion of people in working age.

The different stage reached by each ASEAN countries along the path of the demographic revolution is therefore illustrated also by the percentage of young people and of WAP (Table 6). The percentage of the former is included between a minimum of 17.4 per cent in Singapore and a maximum of 35.5 per cent in the Philippines, with other three countries registering values above 30 per cent: Laos, Cambodia, and Malaysia. At the same time Singapore presents the highest percentage of WAP (73.6 per cent), and other three countries (Thailand, Vietnam, and Brunei) are characterized by values above 70 per cent. At the opposite end of the ranking we find as expected the Philippines, where WAP weights only 60.9 per cent, preceded by Laos, Cambodia, and Malaysia

Table 6 - ASEAN countries; total population; percentage composition by main age group; 2010

	0-14	15-64	65+	80+
Singapore	17.4	73.6	9.0	1.8
Thailand	20.5	70.6	8.9	1.7
Vietnam	23.6	70.4	6.0	1.2
Brunei	26.2	70.2	3.6	0.7
Myanmar	25.8	69.2	5.0	0.8
Indonesia	27.0	67.4	5.6	0.7
Malaysia	30.3	64.9	4.8	0.6
Cambodia	31.9	64.3	3.8	0.4
Laos	34.5	61.6	3.9	0.5
Philippines	35.5	60.9	3.6	0.4
Max - Min	18.1	12.7	5.4	1.4

Source - author elaboration on United Nations data, United Nation. 2011a

3 THE EVOLUTION OF WORKING AGE POPULATION

3.1 ASEAN

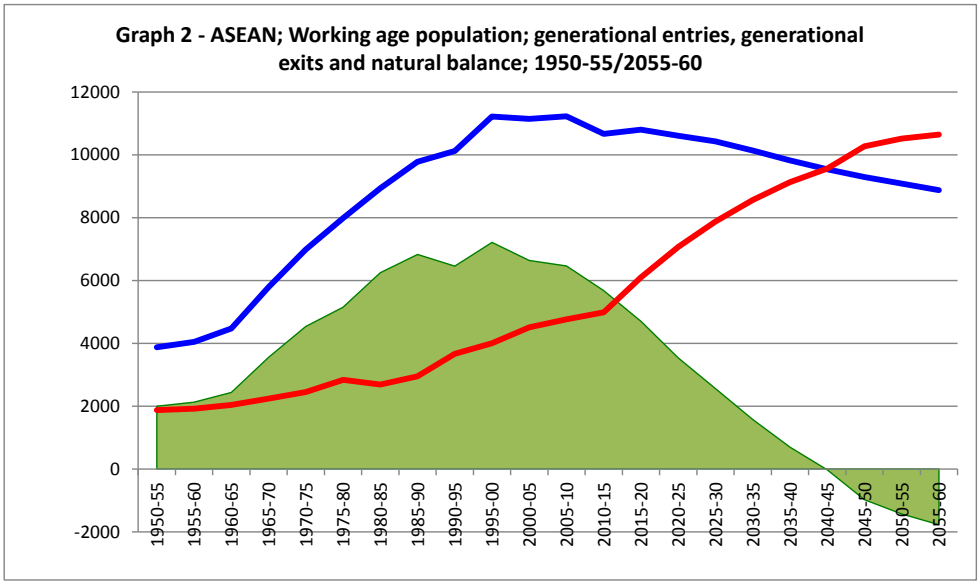
Given the scope of this paper, we will now concentrate our attention on the effects of the Demographic revolution on WAP that is the source of labor supply, a first necessary step to analyze labor mobility and the role of education and vocational training.

As we have already seen, from this perspective, one of the first impacts of the Demographic revolution is that of provoking an extremely relevant increase in WAP[8], a phenomenon that has initially characterized the

[8] The first manifestation of the demographic transition is the reduction of the infant mortality rate that will then be translated into an increase in the size of the cohorts entering reproductive age, while the TFR is still at the traditional level. This will, in its turn, provoke a progressive increase in the number of yearly births, a trend that will continue also when the fertility rate will start to drop, due to the increasing dimension of the cohorts in reproductive age. This is the chain of events that has

developed countries -the firsts to enter the demographic revolution in the XVIII and XIX century- then the developing countries from the middle of the XIX century, and is now starting to affect the least developed countries.

Graph 2 shows the impact of the demographic revolution on the total WAP of ASEAN. Initially, the expansion in WAP has been driven by an extraordinary increase in generational entries[9] that grew from an average yearly value of around 4 million in the fifties to record values of above 11 million between 1995 and 2010. Generational exits have started to register relevant increases only at the beginning of the '90s when bigger cohorts have reached "retirement age". As a consequence of these events as well of the migration flows we have previously documented, the WAP of ASEAN has increased from 100 million in 1950 to 398 million in 2010. We can, therefore, safely assume that at present the ASEAN WAP is above 400 million.



Source - Author elaboration on United Nations data, United Nations, 2011a

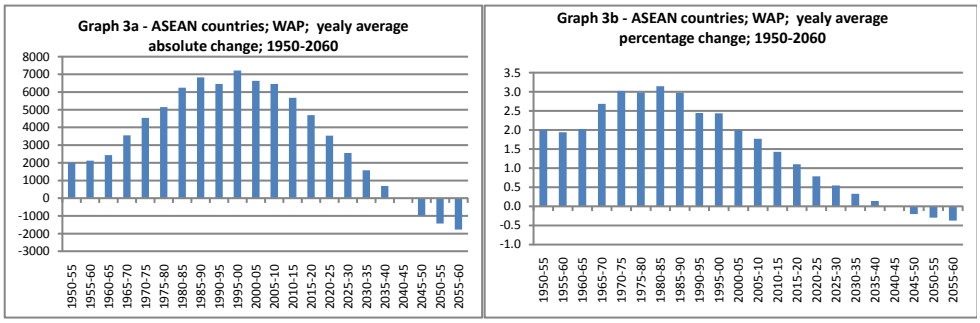
At the beginning of the new century ASEAN WAP starts to exhibit the second effect of the demographic revolution: a progressive, but rather fast slowdown in its rate of growth, due mainly to the increase in generational exits, but also to the smaller number of young people reaching working age. According to the U.N. Population Division, in about 30 year, generational exits from WAP will begin to exceed generational entries and WAP will start to decline. On the basis of the hypotheses adopted by the Population Division for the Medium variant scenario, inclusive of the assumptions on migration that we will discuss in a later paragraph, ASEAN

determined the explosion of WAP in developed countries in the second half of the XIX century and at the beginning of the XX.

[9] Generational entries are equal to the number of people who become 15 in the time interval considered, while generational exits are equal to the number of people who become 65 in the same period plus the people who died.

WAP is expected to peak at 491 million in 2040, to then decline to 470 million in 2060[10].

Graphs 3a and 3b present the evolution of the yearly average absolute change and of the yearly average rate of growth of WAP registered between 1950 and 2010 and the values forecasted for the following 50 years.



Source - Author elaboration on United Nations data, United Nations, 2011a

The absolute growth of ASEAN WAP did reach a maximum value of 7.2 million in the 1995-2000 interval, and is now down to around 6 million; it is expected to decline to 3.5 million at the beginning of the 2020s, to 1.5 million at the beginning of the 2030s, and to become negative in the 2040s. The percentage rate of growth did peak earlier, in the 1980-85 period, at 3.1 per cent. It is now down to 1.4 per cent, and is expected to decline by around 60 per cent every ten years.

These data show that the pressure to create additional jobs in order to accommodate the incoming generations is already declining and it will continue to do so in the foreseeable future. This trend will, on one hand, facilitate the ongoing process of modernization, i.e. the substitution of employment in the agricultural sector with employment in the modern sectors, but on the other will make unavoidable a marked increase in the exchange of Labor force within ASEAN.

3.2 The country level

As we have already discussed, the ten countries that constitute ASEAN have been moving along the path of the demographic revolution at different speed and, therefore, they are presently located in different stages of this process. As we will discuss in the following paragraphs, this has very important implications with respect to internal and external mobility.

WAP, net of migrations, is forecasted to continue to grow until 2060 in only two of the ten ASEAN countries, Malaysia and Philippines. In all the other eight, an historical maximum will be reached at or before 2050. The first country whose WAP would peak in absence of migration is Singapore, in 2015; Thailand will follow in 2020; Myanmar, Vietnam and Indonesia in 2035; Brunei in 2040; Cambodia in 2045; Laos in 2050 (Table 7).

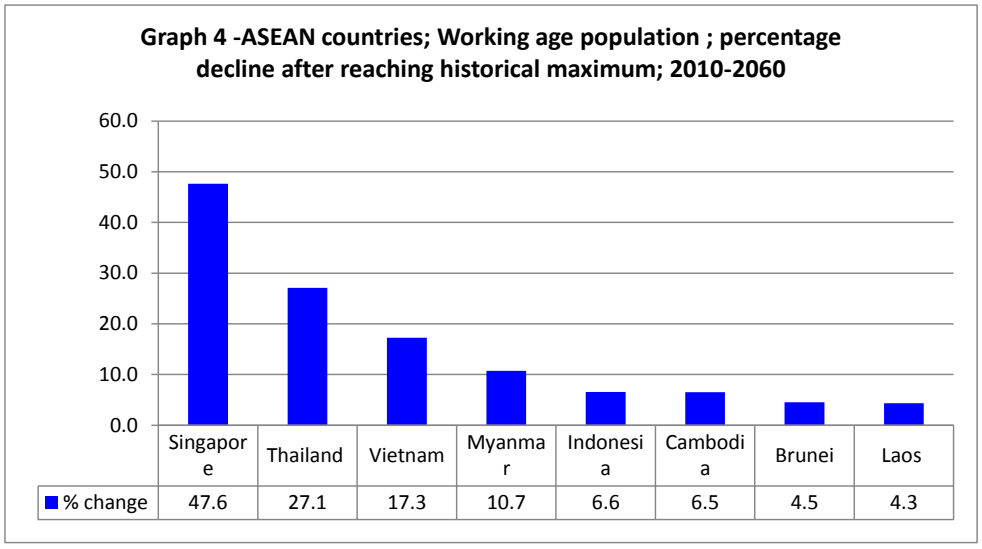
[10] See United Nations, 2011a

Table 7 -ASEAN countries; Working age population; absolute values; 1950 -2060

	Singapore	Thailand	Myanmar	Vietnam	Indonesia	Brunei	Cambodia	Laos	Malaysia	Philippines	ASEAN
1950	585	11,257	10,704	18,063	42,561	29	2,395	966	3,305	9,717	99,582
1960	897	14,770	11,709	19,520	51,944	43	2,980	1,174	4,167	12,985	120,189
1970	1,202	19,395	14,241	22,891	63,349	68	3,746	1,481	5,666	18,085	150,124
1980	1,647	27,045	18,301	29,361	83,461	112	3,778	1,699	7,946	25,188	198,538
1990	2,200	37,259	23,418	38,242	110,202	157	5,086	2,209	10,796	34,334	263,903
2000	2,791	43,654	28,970	49,079	137,966	218	6,893	2,873	14,715	45,079	332,238
2005	3,068	46,417	31,053	55,554	150,282	247	8,058	3,287	16,572	50,877	365,415
2010	3,742	48,786	33,206	61,842	161,699	282	9,090	3,821	18,432	56,819	397,719
2015	3,783	49,935	35,428	65,930	173,599	302	10,083	4,389	20,191	64,315	427,955
2020	3,669	50,071	36,773	68,438	184,564	320	10,892	4,872	21,799	71,721	453,119
2025	3,421	49,211	37,799	70,570	192,514	335	11,641	5,296	23,044	78,505	472,336
2030	3,176	47,794	38,519	71,714	197,661	345	12,308	5,669	24,117	85,162	486,465
2035	2,898	45,855	38,792	71,924	199,921	353	12,884	6,004	25,203	91,690	495,524
2040	2,705	43,870	38,484	70,955	199,899	355	13,339	6,272	26,191	97,971	500,041
2045	2,529	41,918	37,950	69,193	198,032	352	13,775	6,440	27,031	103,607	500,827
2050	2,356	39,966	37,063	66,263	194,648	351	13,500	6,493	27,623	108,480	496,743
2055	2,201	38,084	35,827	62,866	190,939	345	13,275	6,408	28,010	112,377	490,332
2060	1,981	36,171	34,632	59,515	186,766	339	12,876	6,212	28,207	115,439	482,138
1950-2010	3,157	37,529	22,502	43,779	119,138	253	6,695	2,855	15,127	47,102	298,137
2010 -2060	-1,761	-12,615	1,426	-2,327	25,067	57	3,786	2,391	9,775	58,620	84,419
Max - 2010	41	1,285	5,586	10,082	38,222	73	4,685	2,672	9,775	58,620	103,108
2060-Max	-1,802	-13,900	-4,160	-12,409	-13,155	-16	-899	-281	9,775	58,620	-18,689

Source - Author elaboration on United Nations data, United Nations, 2011a

As a consequence, in absence of migration, these eight countries will register very substantial declines in WAP although over different time intervals, the duration of the interval obviously playing a central role in determining the amount of the decline. Singapore, the most advanced country along the demographic revolution and the first to register the historical peak of WAP, is forecasted to lose almost 50 per cent of its WAP, Thailand 27.1 per cent, Vietnam 17.3 per cent, Myanmar 10.7 per cent and the other countries percentages between 4 and 7 per cent (Graph 4) All together the WAP of these countries is expected to decline by around 45 million.



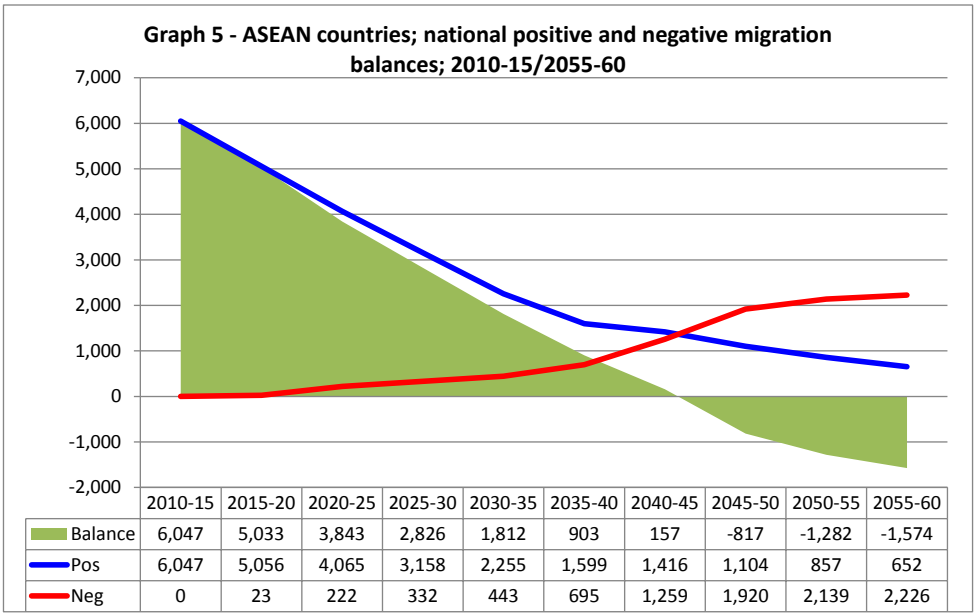
Source - Author elaboration on United Nations data, United Nations, 2011a

The most suggestive aspect is, however, that from 2015 ASEAN will start to include an increasing number of countries that will be characterized by a declining WAP and others where WAP will still be growing, but at a diminishing pace.

Table 8 - ASEAN countries; Working age population; absolute yearly change; 2010-2060; thousand

	Singapore	Thailand	Myanmar	Vietnam	Indonesia	Brunei	Cambodia	Laos	Malaysia	Philippines	ASEAN
	Absolute yearly change										
2010-2015	8	230	444	818	2,380	4	199	114	352	1,499	6,047
2015-2020	-23	27	269	502	2,193	4	162	97	322	1,481	5,033
2020-2025	-50	-172	205	426	1,590	3	150	85	249	1,357	3,843
2025-2030	-49	-283	144	229	1,029	2	133	75	215	1,331	2,826
2030-2035	-56	-388	55	42	452	2	115	67	217	1,306	1,812
2035-2040	-39	-397	-62	-194	-4	0	91	54	198	1,256	903
2040-2045	-35	-390	-107	-352	-373	-1	87	34	168	1,127	157
2045-2050	-35	-390	-177	-586	-677	0	-55	11	118	975	-817
2050-2055	-31	-376	-247	-679	-742	-1	-45	-17	77	779	-1,282
2055-2060	-44	-318	-239	-670	-835	-1	-80	-39	39	612	-1,574

Source - Author elaboration on Population Division data, United Nations, 2011a



	2010-15	2015-20	2020-25	2025-30	2030-35	2035-40	2040-45	2045-50	2050-55	2055-60
Balance	6,047	5,033	3,843	2,826	1,812	903	157	-817	-1,282	-1,574
Pos	6,047	5,056	4,065	3,158	2,255	1,599	1,416	1,104	857	652
Neg	0	23	222	332	443	695	1,259	1,920	2,139	2,226

Source - Author elaboration on United Nations data, United Nations, 2011a

Graph 5 shows how the progressive reduction in ASEAN WAP growth and its becoming negative starting in 2040 will be brought about by the fact that an increasing number of countries will register a negative trend in their WAP.

4 THE CAUSES OF ECONOMIC MIGRATIONS

International migration flows are largely explained by the co-presence of countries characterized by a structural lack of labor supply and countries characterized by a structural excess of labor supply[11], the thesis being that migrations are demand driven, but take place only when excess supply is present in other countries[12].

[11] For a detailed presentation of the model and an application to a series of countries and areas with below replacement fertility see M. Bruni, 2009; for an application to China see M. Bruni 2013 and 2011, and M. Bruni and C. Tabacchi, 2011.

[12] According to this perspective the Migration Balance of arrival countries are determined by their Total Manpower Needs. As a consequence the world total migration flows are largely determined by the need of labor in arrival countries.

We will say that a country is characterized by a structural lack of labor supply, when a relevant share of the available jobs cannot be covered by the local labor supply. Analogously, we will say that a country is characterized by a structural excess of labor supply when a relevant and growing share of its labor supply cannot find employment. The countries characterized by a structural lack of labor supply are potential countries of arrival, while the countries characterized by a structural excess of labor supply are potential countries of departure.

Let's define Total Manpower Needs as the difference between the increase in labor supply and the increase in labor demand, over a given time interval. Taking an operational perspective, the change in labor supply can be identified with the change in the level of the local Labor force (ΔLF) registered or forecasted over a given interval (t, t+1). The increase in labor demand can be identified with the change in the level of employment (ΔE) registered or forecasted over a given interval (t, t+1).

The absolute change in the Labor force is the results of two components, one of demographic origin, the second connected to the propensity of the people in working age to participate in labor market activities. The former is identified in the change of the level of the Labor force due to the change in the level of Working age population, keeping the participation rate constant. Therefore, it is equal to the product between the change in WAP (ΔWAP) [13] and the rate of participation (rop) at the beginning of the period. The latter is the result of the change in participation behavior taking place during the interval considered, and it is equal to the product between the change in the rate of participation and the level of the Labor force at the end of the period.

$$1]\ {}_tTMN_{(t+1)} = {}_t\Delta LF_{(t+1)} - {}_t\Delta E_{(t+1)}$$
$$= [(rop_t * {}_t\Delta WAP_{(t+1)}) + ({}_t\Delta rop_{t+1} * LF_{(t+1)})] - {}_t\Delta E_{(t+1)}$$

All three components of [1] can be positive or negative, depending on the trends in Employment, Labor force and Rate of participation. This implies that also Manpower Needs can be positive or negative.

A negative value of TMN implies that the growth in labor supply has been (or is forecasted to be) smaller than the growth in employment. As we have already stated, a negative difference between the change in labor supply and labor demand identifies a situation of structural lack of labor supply if it is a growing, and long-lasting phenomenon. In a first phase the difference can be, at least partially, satisfied by the unemployed, by an increase in Labor force participation, especially women, by internal migrations from more underdeveloped internal areas. Sooner or later, these additional sources of labor supply will necessarily be exhausted and international migrations will represent the only possible solution.

By converse, a positive value does imply that the country is accumulating an excess of labor supply that cannot be satisfied by local

[13] What we will consider is in fact the natural balance of WAP, which is equal to the difference between generational entries and generational exits inclusive of the deaths registered during the period.

demand[14]. As in the previous case, this situation can be identified as Structural excess of labor supply if it is a growing, and long-lasting phenomenon. In this case, the situation initially can be dealt with by an expansion of the informal economy, a widening of the average dimension of the family and by a reduction in the participation rate, especially of women. However, in the long run, only massive migration flows can solve the problem. In their absence, a growing number of young people will find themselves without any perspective for the future, and could be willing to do anything because a life without job is also a life without value. Also in this case, in the long run only migration can provide a solution to the problem

A few final considerations are needed. In the first place what we are considering are the very special situations that have been created, are created and will inevitably be created by the demographic revolution. They are characterized by changes in the level of WAP of such a dimension that cannot be dealt with, on one hand, by wage adjustments or increases in productivity and, on the other, by high rates of growth of employment.

The declines in WAP brought about by the demographic revolution have often such a dimension and will span over such a long period that it is totally unrealistic to assume that labor productivity could grow enough to both offset the decline in labor supply and allow production to grow. Let's for instance consider the case of Japan. According to the Population Division medium variant scenario, between 2010 and 2060, the WAP (15-64) of Japan is expected to decline by 34.8 per cent, from 81 to 53 million. The direct implication is that in order to avoid more immigrants than the 2.8 million hypothesized by the UNPD, labor productivity should increase by 34.8 percentage points more[15] than the percentage growth in production[16].

Given that the increase in labor productivity does not represent a viable alternative to migration, do other alternatives exist? The only economically viable alternative is to move production abroad. However it has been rightly observed: "As its economy matured and its population aged, a country could safely become a rentier state, boosting its economic product, and in particular paying its pensions, with the income from its international investments. The more youthful countries on the receiving end would no doubt prefer the inflow of capital to an outflow of labor. In the world as it is, however, that may be a less prudent portfolio diversification by an ageing society of retirees than an hostage to fortune." [17] In practice, the delocalization of production is a viable economic solution, but it presents risks that a country could not be willing to take.

[14] It should be obvious that in all the countries that find themselves in this situation the real wage already at or below the subsistence level cannot be an answer to the problem.

[15] In the last 50 years production has increased more than productivity in all industrialized countries as shown by the fact that in the long run employment has increased in all of them, declining only in periods of heavy restructuring of the production structure or of economic crisis. It must also be recalled that the larger the service sector the more difficult is to achieve high rate of growth of productivity or, stated in another way, the employment-income elasticity tends to be low in post industrial economies.

[16] This is implicit in the fact that the growth in employment is identically equal to the difference between the rate of growth in production an the rate of growth in productivity.

[17] McNicoll, D. 2000

The situation of excess labor supply generated by the Demographic revolution normally takes place in countries still largely dominated by the agricultural sector and in which the process of modernization requires not only the expansion in the employment level of Industry and Services, but also a growth in the employment level of these two sectors sufficient to replace non productive jobs in agriculture. Initially, the most probable outcome is that agriculture absorbs the excess of labor supply determining the situation described in Lewis seminal article in which the real wage is at subsistence level. However, with time large migration flows could be the only available mean to avoid the spread of poverty and income inequality.

The last point we have to consider is the relationship between Manpower needs and migration flows. In general we can say that the level of migration is positively related to manpower needs:

$$2] \quad Migr = B\ TMN$$

where B is equal to or greater than 1. At the beginning of any economic emigration process, only workers will move to the destination country. With time, they will be eventually reached by some members of the family. Therefore, at the initial stage B is equal to 1 and will then progressively increase. Previous analyses have shown that at present, in countries of old migration, B is equal to approximately 1.5[18].

5 ASEAN MIGRATION IN THE INTERNATIONAL CONTEXT

ASEAN includes countries like Philippines and Indonesia whose workers are migrating not only within ASEAN and to other Asian countries, but also to Europe, America and Australia, while Singapore, Thailand and Malaysia are becoming prominent arrival countries. To provide some more solid reference points to the forecasting exercise we are going to present in the following paragraphs, we deem relevant to present a concise overview of the tendencies in international migrations and project the migratory behavior of ASEAN countries against the general background of the Asian continent.

Between 1950 and 2010, international migration flows have been characterized by three main trends: i) a substantial increase in the total level; ii) a notable increase in the percentage of intercontinental flows; iii) very relevant changes in the structures of both arrival and departures flows by area and continent.

Between 1950-55 and 1990-95 international migration flows have increased almost fourfold, from 6 to 28.6 million, a value that still marks the historical maximum. After a small contraction registered in the last five years of the century, between 2000 and 2010, around 54 million people have left their native countries, bringing the total number of world migrants in the last sixty years above the 200 million mark (Table A1).

Between 1950 and 1960, intercontinental migration flows represented 48 per cent of total international migration flows (6.7 million out of 14 million); between 2000 and 2010 the percentage has increased to 62 per cent (34 out of 54 million) (Table A1).

[18] M. Bruni, 2009

In the former period, intercontinental migration flows were generated, in order of importance, by Europe, Africa and South America, while the main areas of arrival were the New World Countries (NWC: USA, Canada, Australia, and New Zealand) and Asia. In the latter period, departures were generated mostly by Asia, Central and South America, and Africa, while the main areas of arrival were Europe, NWC and Gulf Countries (GC). Therefore, in only sixty years, Europe has become the main area of arrival, while Asia has become the world major supplier of labor.

Between 1950 and 1960, the NWC were the main pole of attraction of international migration flows. They received around half a million migrants per year, i.e. 36.4 per cent of total migration flows. Western Europe (with France and Germany, but also Switzerland, Belgium and Sweden) was the second pole of attraction. Brazil, Argentina and Venezuela represented the third pole of attraction (Table A2).

Fifty years later the situation has radically changed. As we have already seen, Europe has become the main port of arrival, while the Countries of the Gulf have become the third largest pole of attraction after the NWC. Eastern, Central and especially Southern Asia, Central and Southern America, Northern, Eastern and Western Africa are now the areas that provide labor to the rest of the world. More specifically, on one hand:

- Europe has received 20.1 million migrants [19];
- Arrivals in the NWC have been in excess of 15 million; 72.8 per cent have chosen the US, 11.7 per cent Australia, 4.3 per cent Canada and 1.3 per cent New Zealand;
- The GCs have attracted 8.7 million immigrants, 3.9 million of which went to the Arab Emirates and 2.8 million to Saudi Arabia.

On the other hand, both Latin America and Africa had negative migration balances of respectively 11.2 million[20] and 6.3 million[21].

Beside the six Gulf countries, other 15 Asian countries have registered positive migration balances so that the total number of arrivals has exceeded 14 million, while 27 countries have been affected by negative migration balances for a total amount of 30.6 million. Therefore, the continental migration balance has been negative and equal to around 16 million (Table A3).

After the two largest gulf countries (Arab Emirates and Saudi Arabia), the main arrival country has been Thailand, followed by Qatar and Singapore. The list of Asian arrival countries includes other 5 countries in

[19] Of the 40 European countries 27 are arrival countries and 13 departure countries. The main arrival countries have been, in order of relevance, Spain, Italy, the Russian Federation, and the United Kingdom, followed by the more traditional arrival countries such as France and Germany, together with Sweden, Belgium and Austria. Exits from the departures countries have been only 1.8 million.

[20] Between 2000 and 2010 only 8 Latin America countries have registered a positive migration balance, and for a very modest total value of 0.4 million. Negative migration balances, for a total value of 11,6 million, have been registered by the other 28 countries. Mexico with 4.4 million (37.9 per cent of the total) leads the ranking followed by Peru, Brazil, El Salvador and Guatemala.

[21] In Africa 16 countries have registered positive migration balances for a total value of almost 4 million; 36 have registered negative migration balances summing to more than 10 million. South Africa (1.6 million) has been the most important arrival country followed by Burundi and Sierra Leone, both accounting for more than half a million immigrants. The ranking of arrival countries is lead by Zimbabwe, followed by Morocco, Ivory Cost, Guinea and Egypt.

Eastern Asia, (Azerbaijan, Cyprus, Israel, Jordan, and Lebanon), but also Afghanistan and Bhutan, Hong Kong and Macao, Malaysia, Brunei and Japan. If the main country of departure has been India -that has generated almost half a million migrants per year- other 5 countries have registered more or about 250,000 departures per year: Bangladesh, China, Pakistan, Indonesia and Philippines. These six countries are between the seven most important departure countries, the other being Mexico, that ranks second after India (Table A2).

In conclusion, of the 21 Asian arrival countries, 4 are ASEAN countries, Thailand and Singapore being respectively the third and fifth more relevant arrival countries in Asia. At the same time, other two ASEAN countries, Philippines and Indonesia, are fifth and sixth in the Asian ranking of departures countries and sixth and seventh in the world ranking[22].

6 LABOR MARKET AND DEMOGRAPHIC SCENARIOS

We will now propose some Manpower Needs and Migration scenarios for the three ASEAN countries that have registered the largest positive migration balances during the 2005-2010 period: Singapore, Thailand and Malaysia[23]. The scenarios have been constructed on the basis of the model we have previously introduced.

The scenarios are relevant not only because Singapore and Thailand are the two ASEAN countries that have reached the most advanced stage of the demographic revolution, but because they will be the firsts to register a negative natural balance of WAP (15-64) that will then progressively increase in absolute value. Malaysia, while having progressed a lot in terms of life expectancy and infant mortality is still characterized by a rather high TFR and, according to the Population Division, its TFR is expected to decline at much lower speed than those of the other ASEAN countries. However, as we have already seen, Malaysia has already been receiving a relevant, although smaller than in the past, number of migrants.

6.1 Main tendencies of the labor market in Singapore, Thailand and Malaysia

Between 2005 and 2010, Singapore, Thailand and Malaysia have registered notable percentage increases in the level of employment (Table 9), the record value (34.4 per cent) being that of Singapore, followed by Malaysia (10.8 per cent), and Thailand (7.9 per cent). Despite the positive migration flows registered during the same period, in Singapore and Thailand the Labor force has grown less than employment. Therefore, both countries have registered a decline in the level of unemployment, and obviously an even more pronounced decline in the rate of unemployment. In Malaysia, Labor force has increased slightly more than employment, but the unemployment rate has declined. Taken together, the 3 countries have

[22] The average yearly values have been: 144,000 (Singapore), 98,000 (Thailand) and 17,000 (Malaysia).
[23] The other country to register a positive migration balance has been Brunei.

generated, over the five-year period, 4.6 million jobs, equal to a percentage increase of 9.8 per cent, while the Labor force has expanded by 4.4 million.

Table 9 - Singapore, Thailand and Malaysia; main labour market variables and indicators; 2005 ad 2010

	2005	2010	Abs. change	% change	2005	2010	Abs. change	% change
	Singapore				Thailand			
Employment	2,267	3,047	781	34.4	35,257	38,037	2780	7.9
Unemploymen	101	89	-12	-11.6	663	402	-261	-39.3
Labour force	2,367	3,136	769	32.5	35,920	38,440	2519	7.0
WAP (65 +)	3,376	4,198	822	24.4	48,942	52,856	3914	8.0
roa	70.1	74.7	4.6	6.5	73.4	72.7	-0.7	-0.9
roe	67.1	72.6	5.4	8.1	72.0	72.0	-0.1	-0.1
rou	4.2	2.8	-1.4	-33.3	1.8	1.0	-0.8	-43.3
	Malaysia				Total			
Employment	10,045	11,129	1084	10.8	47,569	52,214	4645	9.8
Unemploymen	368	388	20	5.4	1,132	879	-253	-22.3
Labour force	10,414	11,517	1104	10.6	48,701	53,093	4392	9.0
WAP (65 +)	16,451	18,369	1918	11.7	68,769	75,423	6654	9.7
roa	63.3	62.7	-0.6	-0.9	70.8	70.4	-0.4	-0.6
roe	61.1	60.6	-0.5	-0.8	69.2	69.2	0.1	0.1
rou	3.5	3.4	-0.2	-4.7	2.3	1.7	-0.7	-28.8

Sources - National data from various sources

As we have already seen, according to the United Nation Population Division, between 2005 and 2010, Singapore, Thailand and Malaysia have registered net migration balances of respectively 720,000, 490,000 and 85,000 people, for a grand total of 1,295,000, a value that, as we will see later, does probably largely underestimate the real value. It is therefore evident that without migrants the growth in labor supply would have been insufficient to face the growth in labor demand: in Singapore migrants have covered almost the total increase in labor demand (95.2 per cent), in Thailand 17.6 per cent and in Malaysia around 11 per cent. Therefore, migrants have covered 30 per cent of the 4.6 million total increase in employment registered by the three countries taken together.

6.2 Hypothesis and computational procedures

In order to provide some indications on the probable trends in the number and typology of migrants that will be needed by Singapore, Thailand and Malaysia in the next 25 years, we have proceeded to build for each countries labor market and demographic scenarios for the period 2010-35, articulated on five-year periods. As indicated in a previous paragraph, the future level of the Migration balance of these three countries will depend mainly on their Manpower needs that, in their turn, will be the result of the trends in labor supply and labor demand.

We recall, first of all, that our scenarios will be based on population, employment and labor force 15 years and older. This choice has been imposed by the fact that all three countries are characterized by a large labor market participation of people above 64 years of age, and by the consideration that this segment of potential supply is going to increase enormously in the next 25 years, as shown in table 10.

Due to its high TFR Malaysia has remained the youngest of the three countries we are considering with a percentage of elderly of only 4.8 per

cent versus values of 8.9 and 8.7 per cent in Singapore and Thailand. According to the Medium variant projection of the Population Division, in the next 25 years, the percentage of elderly will reach 14.5 per cent in Malaysia, 19.6 per cent in Thailand and 26.9 per cent in Singapore.

Table 10 -Singapore, Thailand and Malaysia; Population 65 year and older; 2010-35

	Singapore		Thailand		Malaysia	
	Abs. value	%	Abs. value	%	Abs. value	%
2010	454	8.9	6,002	8.7	1,368	4.8
2035	1,634	26.9	14,284	19.6	4,461	14.5
Diff.	1,180	17.9	8,282	10.9	3,093	9.7

Source - Author elaboration on Population Division data, United Nations, 2011a

Coming now to our computations, the absolute change in labor supply for each of the five year period from 2010-2035 has been estimated by i) computing the absolute change in WAP for each period and ii) multiplying it by the 2010 rate of participation. We must point out that:

- We have considered only one demographic scenario based on the Medium variant projection of the Population Division, the reason being that the other scenarios do not present notable differences since: i) the people who will enter WAP in the next fifteen years are already born; ii) those that will enter WAP in the following 10 years are those that will be born in the next 8 years and no dramatic changes in the TFR are at present foreseeable; iii) all the UN scenarios adopt the same hypotheses on mortality.
- According to the previous model, another element that affects the trend in the level of labor supply is the rate of participation, or more specifically its changes over time. As we have already suggested, Singapore and Thailand boost extremely high participation rates (74.7 and 72.7 per cent) that have been increasing under the pressure of and expanding demand. In Malaysia the rate of participation is about ten points lower (62.7 per cent) due to the limited presence of women in the labor market. Are these national rates going to converge? Up to now, in developed countries the process of modernization has brought strong reduction in the labor market presence of the elderly; however, it is already evident that the lengthening of the training phase, the ageing process together with the improvement in health conditions and the restriction in the welfare system imposed by much tighter economic situations are going to push in the opposite direction and keep older people in the labor market longer than at present. This would seem to suggest that in Singapore and Thailand opposite forces could maintain the rate of participation at around the present value. In Malaysia the situation presents an additional factor, the behavior of the cohorts of young girls entering the labor market in the next years. If it is possible that

the rate of participation of the next cohorts will be higher than that of the previous generations, their contribution to labor market participation could be countered by the fact that both boys and girls will tend to remain longer in the training phase of life. In conclusion, due to the lack of strong evidences in one direction or on the other we have assumed a constant rate of participation.

For Thailand and Malaysia, the absolute change in labor demand has been computed on the basis of two alternative hypotheses: i) a constant rate of growth equal to the one registered between 2005 and 2010 (scenario A); ii) a constant employment growth equal to the absolute growth registered in the same period (Scenario B). In scenario A the absolute change in employment increases progressively, in scenario B the percentage rate of growth declines progressively. In substance, the first scenario is more optimistic, but probably less realistic.

In Thailand, in Scenario A, employment increases of around 17.5 million (46.2 per cent) over 25 years, while in Scenario B employment grows by little less than 14 million (36.5 per cent) (Table A4). In Malaysia, in Scenario A, employment grows by 7.5 million (66.9 per cent), in Scenario B by 5.4 million (48.7 per cent) (Table A8).

In the case of Singapore the construction of the scenario had to acknowledge the fact that between 2005 and 2010 employment has grown by an astounding 34.4 per cent. The adoption of such a rate would produce what appears as a totally unrealistic growth in employment (from a little more than 3 million in 2010 to around 11.5 million in 2035). For Scenario A we have therefore assumed a constant average growth rate equal to half that registered between 2000 and 2010. Such a rate, 22.5 per cent, is still more than the double of that adopted for Malaysia (10.8 per cent) and that adopted for Thailand (7.9 per cent). With this assumption Employment grows to around 8.5 million, i.e. 179 per cent.

In analogy with what was done for Thailand and Malaysia, Scenario B assumes a growth in the level of employment equal to that registered between 2005 and 2010 (781,000). In this scenario the rate of growth progressively declines from an initial value of 25.6 per cent during the first five-year period, to 12.7 per cent between 2030 and 2035 and total employment increases from 3 to almost 7 million.

Since in the long run both scenarios could be too optimistic, a third Scenario (Scenario C) is proposed. In this scenario the initial growth rate of employment, taken equal to the one used in Scenario A, is progressively halved down to a value of 1.4 per cent in the last five-year period. In this Scenario the growth in employment is obviously much more limited and equal to 1.5 million over the entire period, a value which however corresponds to a 51 per cent increase over the 2010 value.

The following step has been that of comparing the increase in supply with the increase in labor demand proposed by each scenario in order to estimate whether and how much of the additional labor demand can be covered by the local labor supply, over the next 25 years.

6.3 Manpower Needs

The results of the exercise are summarized in table 11 that presents the Total Manpower Needs that Singapore, Thailand and Malaysia will have to face in the next 25 years in the two scenarios we have previously described. The detailed analysis is presented in the Statistical Annex (Table A4 for Thailand, Table A6 for Singapore, and Table A8 for Malaysia).

Let's observe first of all that in both Singapore and Thailand the absolute changes in labor supply will progressively decrease to become negative in the 2030-35 period. The situation is totally different in Malaysia where the absolute change in Labor force will peak around 2020 and will then decline very slowly in the following years[24].

Table 11 - Singapore, Thailand and Malaysia; Total manpower needs; 2010-2035

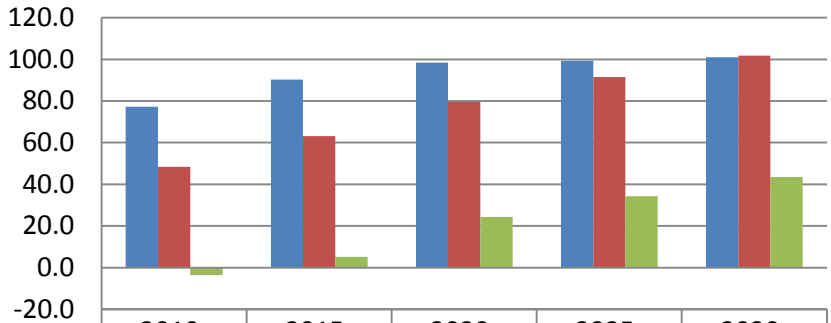
	Singapore	Thailand	Malaysia	Total
	Manpower needs			
2005-2010	-720	-490	-85	-1,295
	enario A: Constant rate of employment grow			
2010-2015	-535	-1,452	43	-1,944
2015-2020	-768	-2,043	-68	-2,879
2020-2025	-1,026	-2,775	-358	-4,159
2025-2030	-1,272	-3,444	-559	-5,275
2030-2035	-1,587	-4,138	-788	-6,512
Total	-5,188	-13,851	-1,730	-20,769
Yearly average value	-208	-554	-69	-831
% distribution	25.0	66.7	8.3	100.0
	Manpower needs			
	Scenario B: Constant employ. growth			
2010-2015	-623	-1,233	160	-1,695
2015-2020	-698	-1,588	178	-2,108
2020-2025	-763	-2,064	32	-2,795
2025-2030	-772	-2,457	-10	-3,239
2030-2035	-795	-2,854	-62	-3,712
Total	-3,652	-10,196	298	-13,549
Yearly average value	-146	-408	12	-542
% distribution	26.9	75.3	-2.2	100.0
Sources - National data from various sources				

[24] If we had used WAP (15-64) the change of sign in Singapore and Thailand would have taken place in the 2015-20 period. The difference we register is due to the ageing process we have previously discussed.

The growth in employment hypothesized in scenario A provokes very large and increasing Manpower needs that sum up to almost 21 million over the 2010-2035 period. Sixty seven per cent would be originated by Thailand (13.9 million), 25 per cent by Singapore (5.2 million), and 8.3 per cent by Malaysia (1.7 million). In Singapore the ratio between Manpower needs (in absolute value) and changes in employment surges from 77.2 per cent in 2010-15 to 90.3 per cent in 2015-20, to then progressively increase to a value of 101 per cent in 2030-35 (Graph 6). In Thailand this ratio is always smaller than in Singapore until the end of the 2020s, but then leaps to 101.8 in the 2030-35 period. As we have already underlined, in Malaysia the growth in labor supply will be relatively much more pronounced since the drop in fertility has been more limited than in Singapore and Thailand. As a consequence, the local Labor force should be more than sufficient to cover the additional jobs created in the 2010-15 period. Manpower needs become negative in the following interval and will then progressively increase to represent 43.5 per cent of additional employment in 2030-35.

Scenario B (that assume a constant growth in the level of employment and therefore a declining rate of growth) generates a lower amount of Manpower needs (13.5 million) and some other qualitative differences. The distribution of Manpower needs between the three countries is more skewed, with Thailand accounting for 75.3 per cent, Singapore for 26.9 per cent and Malaysia presenting an overall negative value.

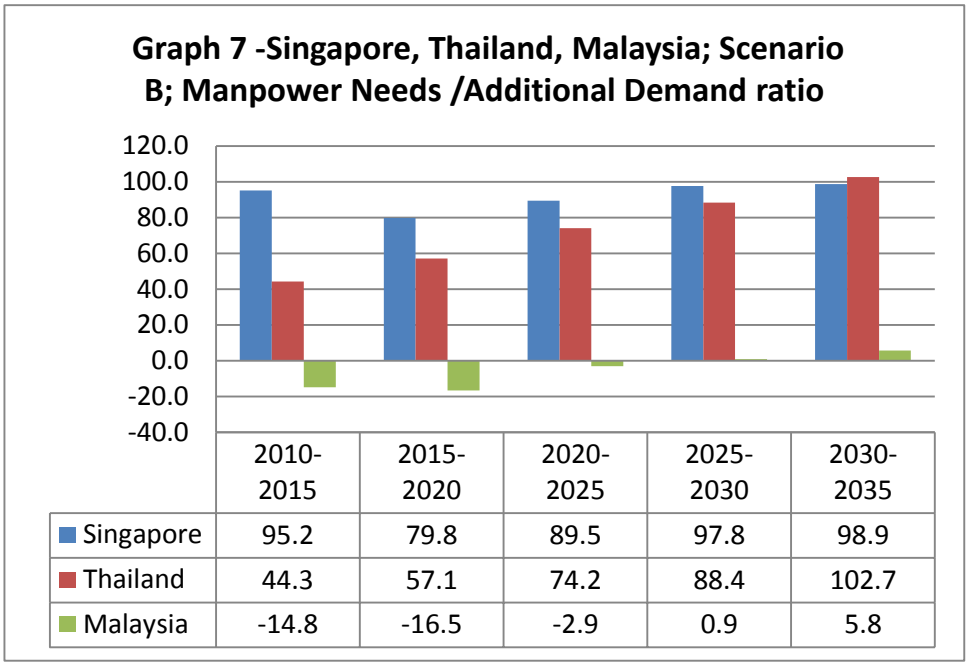
Graph 6 - Singapore, Thailand, Malaysia; Scenario A; Manpower Needs /Additional Demand ratio



	2010-2015	2015-2020	2020-2025	2025-2030	2030-2035
Singapore	77.2	90.3	98.4	99.3	101.0
Thailand	48.4	63.1	79.5	91.4	101.8
Malaysia	-3.6	5.1	24.3	34.2	43.5

In the case of Thailand the results of Scenario B are very similar to those of Scenario A, the percentage of manpower needs with respect to labor demand progressively increasing to reach a value above 100 in 2035. In the case of Malaysia local labor supply appears to be sufficient to face the growth in employment outlined in Scenario B until 2030. Finally, in Singapore manpower needs represent around 95 per cent of the increase in employment in the first period, decline to 80 per cent in the following time

interval to then increase again to almost 100 per cent during the 2030-35 period.



	2010-2015	2015-2020	2020-2025	2025-2030	2030-2035
Singapore	95.2	79.8	89.5	97.8	98.9
Thailand	44.3	57.1	74.2	88.4	102.7
Malaysia	-14.8	-16.5	-2.9	0.9	5.8

Source: Author elaboration on National data

In Singapore, scenario C produces a much more conservative forecast of Manpower needs that would be equal to only around 1.3 million for the entire period. Moreover, they would be decreasing through time in parallel with the rate of growth in employment. Also in this case, however, manpower needs will end up being in excess of the increase in employment in the 2030-35 time-interval.

6.4 A clarification of the previous results from a flow perspective

Before summarizing the conclusion suggested by the previous analysis, it is important to clarify the exact meaning of the percentages of Manpower needs we have just presented and more specifically why this percentage can exceed 100 per cent and what does it mean. In order to do so we have to move from a stock to a flow representation of the labor market. This clarification provides some relevant inputs also for the analysis of the relationship between education and vocational training, on one hand, and economic growth and development, on the other.

The increase in employment represents just one part of the number of "new" young people that are needed in any given interval by the labor market, the total number being equal to the sum of i) the people needed to substitute the employed that have definitely left the Labor force for one of the following three reasons: retirement, death, and migration, and ii) the people needed to cover the additional jobs created by the market as a consequence of the increase in production. In other terms, the Labor demand in terms of flows (LDF) (which is measured by generational entries, i.e. first time entries into employment) is equal to the sum of Replacement demand

(RD) (that is measured by the number of people needed to substitute definitive exits from employment) and Additional demand (AD) (measured by the people needed to cover the Additional jobs created in the interval).

$$3] \quad LDF = RD + AD$$

In substance, the ratio between Manpower needs and increase in employment tells us which quota of Additional demand cannot be covered by the local labor supply in terms of flows, i.e. by the people that have entered the labor market for the first time during the interval we are considering.

To exemplify the previous statements, let's consider Singapore in Scenario A. As we have already seen, in the 2010-15 period manpower needs represent 77.2 per cent of the increase in the level of employment. This means that the local labor supply in terms of flow is sufficient i) to fully replace definitive exits from the market (RD), and ii) to satisfy 22.8 per cent of the Additional demand. When we reach the 2030-35 interval, the ratio between the manpower needs and the growth in employment is equal to 101 per cent. In substance, at that time the local labor supply will not be sufficient even to fully cover Replacement demand.

7 MANPOWER NEEDS AND MIGRATION FLOWS

7.1 The stock of migrants in ASEAN countries

The presence of a structural need of migrants is by now extremely evident in Singapore, Thailand, Malaysia and Brunei. Table 12 reports the data on the stock of migrants present in ASEAN countries according to the latest United Nations estimates.

Table 12 - ASEAN countries; stock of migrants, percentage of migrants 20 and above, percentage of female migrants; 2010

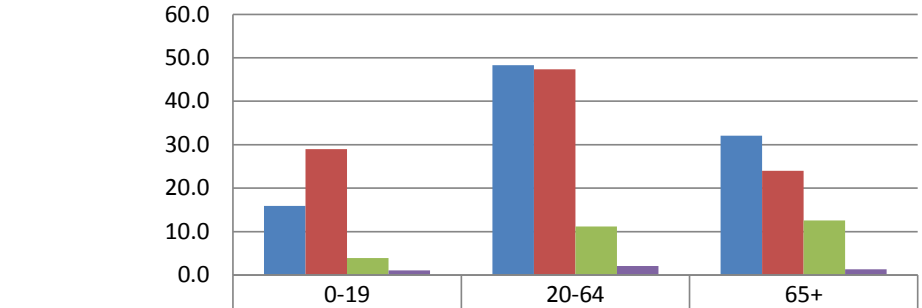
	Number of migrants		% of migrants 20 years old and above	F/T
	Abs. Value	% comp.		
Malaysia	2,358	35.2	82.0	45.2
Singapore	1,967	29.4	83.4	56.0
Thailand	1,157	17.3	81.9	48.4
Philippines	435	6.5	57.1	51.1
Cambodia	336	5.0	62.9	51.7
Brunei	148	2.2	84.7	45.5
Indonesia	123	1.8	78.3	44.5
Myanmar	89	1.3	75.8	48.7
Viet Nam	69	1.0	72.1	36.6
Laos	19	0.3	72.0	48.0
Total	6,701	100.0	79.6	49.6

Source - Author elaboration on Population Division data, 2011b

According to this source, of the 6.7 million migrants present in ASEAN 84 per cent are in the four arrival countries and, more specifically, 35.2 per cent in Malaysia, 29.4 per cent in Singapore, 17.3 per cent in Thailand and 2.2 per cent in Brunei. Since these migrations have been determined by economic reasons, the four countries are also characterized by the highest percentages (all well above 80 per cent) of migrants in working age. In Brunei and Singapore migrants (or more specifically foreign citizens in Brunei and foreign born population in Singapore) represent almost 50 per cent of the population in the 20-64 age group, the value for Malaysia being 11.2 per cent, while according to the same source in Thailand the foreign born population in this age group represent only 2 per cent of the total (Graph. 8). It is also interesting to observe that Brunei has the highest incidence of foreign elderly (a fact that signal that immigration in this country is a old phenomenon), while Singapore has the highest percentage of children showing that recent immigration is made up mainly of young people in reproductive age.

As a matter of fact available information suggests that while estimates for Singapore are sufficiently correct, the data for Thailand and Malaysia largely underestimate the number of migrants.

Graph 8 - Brunei, Singapore, Thailand and Malaysia; percentage of migrants on local population by main age group; 2010



	0-19	20-64	65+
Brunei Darussalam	15.9	48.3	32.1
Singapore	29.0	47.3	24.0
Malaysia	3.9	11.2	12.5
Thailand	1.0	2.0	1.3

Source – our elaboration on Population Division 2011b

According to the 2011 Thailand Migration Report[25], the foreign population working and residing in Thailand is in excess of 3.5 million, three times as much as the Population Division estimate[26]. This would bring

[25] "There are more than 3.5 million persons without Thai nationality living in the country, including many long-term residents and children of migrants born in Thailand. More than 3.0 million of them are working in the country; "Jerrold W. Huguet and Aphichat Chamratrithirong (eds), 2011; p. XII

[26] According to the Report: "In recent decades Thailand has evolved into a regional migration hub in South-East Asia, and is concurrently a country of origin, transit and destination for large numbers of both regular and irregular international migrants. With a dynamic economy, there is also a great deal

the percentage of the foreign population to around 4 per cent. More specifically, according to the Thai Ministry of Interior (MOI), there are a total of 2.46 million low-skilled migrants from the three neighboring countries (Myanmar, Cambodia and Laos). According to the same source, some two million migrants are currently enrolled at some stage of the country's complex registration process for migrant workers and an estimated one million migrants and family members are unregistered. Women account for around 45 per cent and children for 11 per cent of the migrant population.

For what relates to Malaysia the figure presented above refers to legal immigrants. There is however a general consensus that at present Malaysia hosts around two million migrants that should be legalized by an ongoing procedure that started in July 2011. Also in this case the number of migrants would then double with respect to the official figures.

7.2 The migration scenarios

The previous data provide the necessary background for an evaluation of the migration scenarios. As we have already suggested, the number of migrants that a country receives does depend not only on the number of jobs that cannot be covered by the local Labor force, but also on the number of dependents that will accompany, or join in a second moment, the workers. We can, at one extreme, imagine that the number of migrants will be exactly equal to the amount of workers needed by the arrival country. This situation characterizes the initial phase of the immigration process and also subsequent phases if the migration quotas set by the arrival country are not coherent with labor markets needs and, therefore, a very large number of arrivals takes place in risky, illegal situations. Subsequently, when more proper quotas are decided or workers start to be legalized and the possibility of family reunion allowed by the local legislation, the number of dependants tends to increase. It has been estimated that at present in developed countries we can expect 1.5 arrivals[27] for each job position that needs to be covered by an immigrant worker.

Since Southeast Asia countries can be considered in the initial phase of the migration process, the number of immigrants has been computed, both for Scenario A and B, on three alternative hypothesis:

i) B=1
ii) B=1.15
iii) B=1.3

Considering the six cases reported in table 13, the number of immigrants will range:

- In Singapore, from 3.6 million (B1) to 6.7 million (A3)
- In Thailand, from 10.2 million (B1) to 18 million (A3)
- In Malaysia, from a slightly negative value with positive inflows starting in 2025 (B1) to 2.2 million (A3)

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of internal migration, including circular and seasonal migration. However, the highly dynamic nature of migration trends and patterns in Thailand makes the timely formation of comprehensive and coherent migration policies very challenging."

[27] M. Bruni, 2009

Table 13 - Singapore, Thailand, Malaysia; number of migrants (thousand) in alternative scenarios of manpower needs and international labour supply reactivity; 2010-2035

	Migrants											
	Singapore	Thailand	Malaysia	Total	Singapore	Thailand	Malaysia	Total	Singapore	Thailand	Malaysia	Total
	B=1				B=1.15				B=1.3			
	Scenario A											
2010-15	535	1,452	-43	1,944	615	1,670	-50	2,235	696	1,888	-56	2,527
2015-20	768	2,043	68	2,879	883	2,350	78	3,311	998	2,656	89	3,743
2020-25	1,026	2,775	358	4,159	1,180	3,191	412	4,783	1,334	3,607	466	5,407
2025-30	1,272	3,444	559	5,275	1,462	3,960	643	6,066	1,653	4,477	727	6,857
2030-35	1,587	4,138	788	6,512	1,825	4,758	906	7,489	2,063	5,379	1,024	8,466
Total	5,188	13,851	1,730	20,769	5,966	15,929	1,990	23,885	6,744	18,007	2,249	27,000
	B=1				B=1.15				B=1.3			
	Scenario B											
2010-15	743	1,233	-160	1,815	855	1,418	-184	2,088	966	1,603	-209	2,360
2015-20	623	1,588	-178	2,032	716	1,826	-205	2,337	810	2,064	-232	2,642
2020-25	698	2,064	-32	2,730	803	2,373	-37	3,140	908	2,683	-41	3,549
2025-30	763	2,457	10	3,231	878	2,826	12	3,715	992	3,195	13	4,200
2030-35	772	2,854	62	3,688	887	3,283	72	4,242	1,003	3,711	81	4,795
Total	3,599	10,196	-298	13,497	4,139	11,726	-343	15,522	4,679	13,255	-388	17,546

Source - Author elaboration on National data

The net inflow in the three countries over the next 25 years is therefore forecasted between 13.5 (B1) and 27 million (A3). Since at this point of the game, the supply of local labor cannot be manipulated by state intervention and our Labor force forecast has been designed in such a way to represent an over-estimate, the amount of immigrants will depend on two variables: the development path chosen by each country and the growth in employment that will be generated.

We can, moreover, observe that the amount of immigrants we are forecasting is basically on line with what has happened in the last 25 years once we take into consideration that local WAP was expanding at that time, while in the next 25 it will decline.

It could be objected that the most important international Institution that provides demographic forecasts, the Population Division, has published much lower migration estimates. These data that we have reported in Table 14 deserve some comments.

Table 14 -ASEAN countries; number of migrants 1985-2010 and estimates 2010-35, medium variant scenario of the Population Division; thousand; 1985-2035

	Malaysia	Thailand	Singapore	Brunei	Indonesia	Philippines	Vietnam	Myanmar	Laos	Cambodia	ASEAN		
											Arrival countr.	Depat. countr.	Balance
1985-90	460	505	120	5	-265	-300	-330	-135	0	150	1,090	-880	210
1990-95	320	-1,110	230	5	-720	-695	-315	-125	-30	155	-555	-1,730	-2,285
1995-00	420	595	255	5	-775	-775	-285	5	-85	95	1,275	-1,820	-545
2000-05	395	1,105	230	5	-1,185	-1,130	-430	-1,000	-115	-120	1,735	-3,980	-2,245
2005-10	85	490	720	5	-1,295	-1,235	-430	-500	-75	-255	1,300	-3,790	-2,490
1985-2010	1,680	1,585	1,555	25	-4,240	-4,135	-1,790	-1,755	-305	25	4,845	-12,200	-7,355
2010-15	85	395	175	5	-1,005	-1,000	-210	-100	-75	-130	660	-2,520	-1,860
2015-20	85	390	125	5	-950	-940	-200	-50	-75	-65	605	-2,280	-1,675
2020-25	85	385	125	5	-895	-890	-200	-50	-75	-35	600	-2,145	-1,545
2025-30	85	385	120	5	-805	-800	-200	-50	-75	-10	595	-1,940	-1,345
2030-35	85	380	120	5	-720	-720	-200	-50	-75	-10	590	-1,775	-1,185
2010-2035	425	1,935	665	25	-4,375	-4,350	-1,010	-300	-375	-250	3,050	-10,660	-7,610
Diff.	-1,255	350	-890	0	-135	-215	780	1,455	-70	-275	-1,795	1,540	-255

Source - United Nations, 2011a

We observe, first of all that the Migration balance for ASEAN as a whole, with respect to the 2010-2035 period, is slightly higher in absolute value than that registered between 1985 and 2010 (-7.6 million versus -7.4 million), but the overall mobility is forecasted to decline as a result of a sharp contraction of both the inflows in arrival countries and the outflows from departures countries. The firsts decline from 4.8 million to 3 million, the seconds from 12.2 to 10.7 million. More specifically for what relates to arrival countries, inflows are expected to decline in Malaysia (-1.3 million)

and Singapore (-0.9 million), and to increase, although very marginally, in Thailand (+350,000). Outflows are expected to decline in all departure countries, but Vietnam.

In order to understand these data, we must keep in mind that they are not a forecasts based on a model or an extrapolation of past values, but a hypothesis (an educated guess) made on the basis of two considerations: 1) past international migration estimates, and 2) consideration of the policy stance of each country with regard to future international migration flows. It is also evident that in the case of Singapore and Malaysia the policy stands of the two governments have been given a bigger weight than economic considerations.

7.3 The impact of migration on total population

We have just seen that, over the next 25 years, the Population Division forecasts the arrival of 3 million migrants in Singapore, Thailand, Malaysia and Brunei, while our scenarios suggest that the value will be between 13 and 27 million, depending on the rate of employment growth. As a consequence, we also forecast very different demographic trends

It has been stated (and the demographic scenarios proposed by the Population Division endorse this statement as shown in Table 15) that the drop in fertility below replacement level that is affecting an increasing number of developed and developing countries will produce a decline in Total population, an even more pronounced decline in Working Age Population and progressive ageing phenomena that will seriously threaten the sustainability of the present level of production and of the welfare systems of these countries.

Table 15 - Singapore, Thailand and Malaysia; population by main age group; Medium variant projection; 2010 and 2060

		0-14	15-64	65+	totale
Singapore	2010	884	3,742	454	5,080
	2060	854	3,196	1,962	6,012
Thailand	2010	14,195	48,786	6,002	68,983
	2060	9,900	39,871	18,357	68,128
Malaysia	2010	8,617	18,432	1,368	28,417
	2060	8,421	29,032	7,924	45,377
Source - United Nations, 2011a					

This does necessarily happen in a closed population or in a situation in which the migration balance is not assumed (or allowed) to cover the manpower needs created by the contraction in labor supply and the expansion in demand generated by economic growth.

The demographic forecasts for Singapore and Thailand, whose fertility is already below replacement level, are in line with this position.

WAP (15-64) is expected to notably decline in both countries, while the percentage of elderly is expected to dramatically increase. The situation is obviously different for Malaysia where the TFR is still largely above replacement.

The experience of developed countries does, on the contrary, show that the end result of fertility decline is to prompt unprecedented and above replacement net migration flows that increase WAP, raise fertility, and therefore determine significant Total population growth[28].

The model we have proposed, coherently with empirical evidence, brings to the conclusion that the WAP of ASEAN arrival countries will increase, the change being directly related to the rate of growth of employment and inversely related to the rate of natural decline of local WAP (Tables A5, A7, and A9).

8 HUMAN RESOURCES AND ECONOMIC DEVELOPMENT

Education and training have always been considered a fundamental factor in promoting economic growth and social development. However, alternative growth theories have given industrial policies as well as education and vocational training different importance and role[29].

Classical growth models focus on the productivity-enhancing role of technology and human capital. They assume that investments in education and training result in skills, competences and increased capabilities of the workforce and that developing countries have the same capabilities to absorb technologies as the developed countries. The process does automatically take place through spillovers, trade and FDI, learning and increased productivity being a function of the time spent in production (learning by doing). In this context industrial policies play a very limited role, **liberalization** of the product market representing the main drive to growth. No specific educational or vocational training policies are called for to foster economic growth, education and training being only functional to match the skills supply and demand.

In the **institutional approach**[30] the key factor to reach high growth is **diversification** of the production structure, a structural transformation from low productivity, traditional (rural) activities to high productivity, (urban) modern activities, mostly, although not exclusively, in the industrial sector. Productivity grows not because of productivity increases within sectors, but as a result of shifting resources from low productivity to high productivity activities[31]. It has also been argued that the product space and the structure of goods produced determine the capabilities a country has developed, and these capabilities indicate which products or industries a country may easily develop in the future[32]. Industrial policies are, therefore, called upon to

[28] M. Bruni, 2009

[29] For the drafting of this paragraph I am strongly indebted to the following papers: I. Nubler, 2011; M. Cimoli, G. Dosi, and J.E. Stiglitz (eds), 2009, and the presentation of the same book by J. M. Salazar-Xirinachs and I. Nubler, 2010; pp 135-140.

[30] W. Lewis 1954; J. Fei and G. Ranis, 1964.

[31] D. Rodrik, 2009.

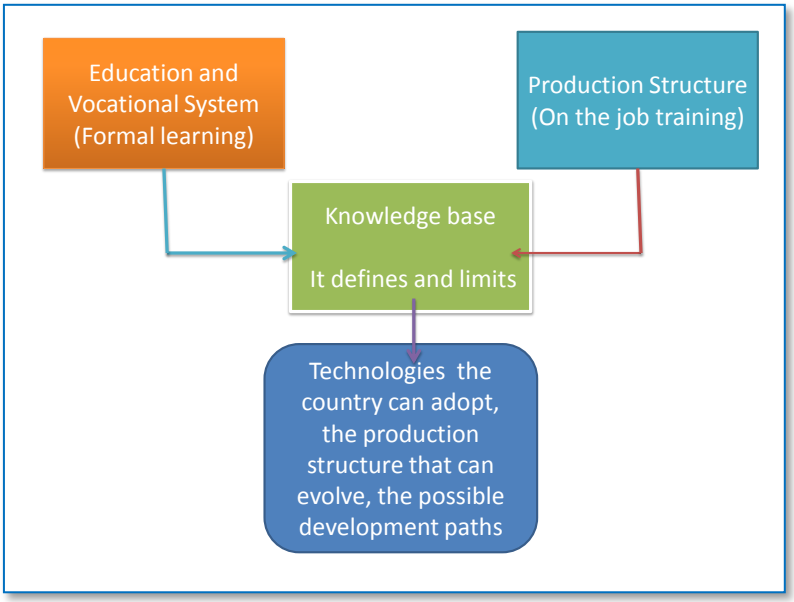
[32] C.A. Hidalgo, and R. Hausmann, 2009.

facilitate a "growth enhancing structural transformation". The challenge is getting the policy approach right by adopting an experimental and creative approach to institutional reforms[33].

According to **New evolutionary economics,** economic development is defined as a process of technological upgrading, of diversification and structural change driven, on one hand, by the accumulation of capabilities and, on the other, by the transformation of the production structure. It is the accumulation of domestic capabilities (that include the development of workers competences, the accumulation of technological and organizational know how in firms, training institutes and governments), which allows moving from the existing knowledge clusters to new knowledge clusters. [34] It is then evident that, according to this approach, not only industrial policies and educational policies can play a central role in fostering economic growth and social development, but they must be designed and implemented in a coordinated way.

In every moment of time the Labor force of a country disposes of a given **knowledge structure.** The knowledge structure is the result of past formal learning processes inside the education and vocational training system and of the training on the job provided by the production structure. In any given moment of time, the knowledge structure defines, the dynamic capabilities of an economy, i.e. determines and limits the technologies the country can adopt, the production structure that may evolve, and therefore the possible paths to economic growth and social development (Figure 1).

Figure 1



[33] It is however been suggested that: "Although this approach recognizes the role of learning and capabilities they are not integrated into the analytical framework and therefore fail to raise policy issues". I. Nubler, 2011; p.8.
[34] M. Cimoli, G. Dosi, and J.E. Stiglitz, 2009 (eds), R. Nelson (2007).

In a first phase economic development can be based upon the incremental diversification of production inside the existing knowledge clusters, i.e. producing more products that require available competences or complementary competences that can be easily acquired.

However, this is not sufficient to speed up development or to start a process of rapid catching up. In order to do so, a country must be able to shift production from low quality activities into "high quality activities", to jump into new knowledge clusters. Empirical and theoretical arguments suggest that the evolution of the knowledge base can play a fundamental role in the catching up process and that successful countries have been able to drive productive transformation by deliberately driving their knowledge structure toward higher diversity and complexity.

Some countries have been inspired by egalitarian principles and have focused on equal access to education, while others have produced polarized educational patterns**.** The countries of the first type have first increased the share of primary, then of lower and higher secondary and finally of post-secondary education. More importantly they have developed a significant share of higher and post-secondary education even at low levels of economic development. In so doing they have been able to shift production into medium technology manufacturing, then diversify production within clusters and finally move to higher technology goods[35]. The second type of countries[36] have generated an educational structure with high shares of people with no-schooling or primary education, on one hand, and of people with post secondary education, on the other. This educational structure provides options in the development of high technology products or advanced services, but limited options for the development of medium technologies. It is also evident that this kind of educational structure cannot produce a relevant economic middle class.

9 THE EDUCATIONA ATTAINMENTS OF ASEAN COUNTRIES

As we have just seen, it is the knowledge structure of the country that defines the options and the dynamic capabilities of an economy, determining which production structure can evolve. The education structure of the population can be used as a proxy of the available capabilities since it provides an indication of the technologies and of the level of complexities that the Labor force can manage.

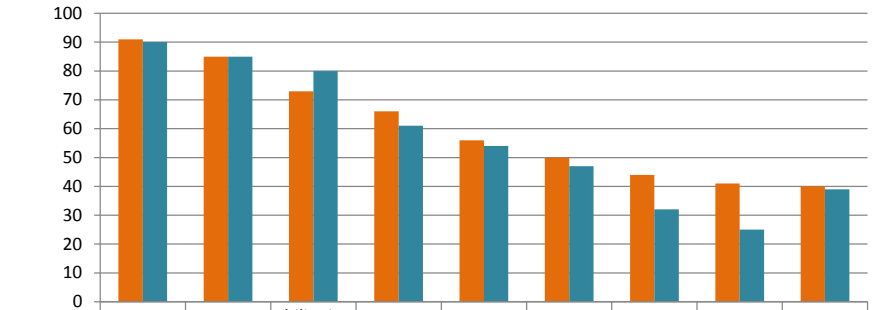
More specifically, we can assume that a country with a strong share of (young) population with lower or upper secondary education embodies strong options to shift its production structure into low and medium technology products since this educational level provides the basis for training craft people, machine operators, technician and clerks which are required by more complex manufacturing sectors. However, it is only a high share of post-secondary education that will allow developing the economic, administrative, technical competencies together with the managerial skills

[35] China and Korea belong to this group.
[36] This group includes many Latin America countries including Argentina, Brazil and Chile, but also India and Thailand.

and business leadership required to shift the economy toward medium and high technology goods and advanced services

The different levels of economic development reached by ASEAN countries have been fostered and reflect their different educational attainment. Graph 9 reports for all ASEAN countries, with the exception of Brunei[37], the percentage of men and women in the age group 15-44 with at least secondary education[38]. The ranking is lead by Singapore followed by Malaysia and Philippines. Intermediate positions are occupied by Indonesia and Thailand. At the bottom of the ranking we find Myanmar, Laos, Cambodia and Vietnam[39].

Graph 9 - ASEAN countries; men and women (15-44) with at least secondary education; percentage values; 2007



	Singapore	Malaysia	Philippines	Indonesia	Thailand	Myanmar	Laos	Cambodia	Vietnam
Men	91	85	73	66	56	50	44	41	40
Women	90	85	80	61	54	47	32	25	39

Source – IIASA 2008

Men register higher values in all countries with the only notable exception of Philippines where women percentage is 7 points higher than that of men. In Singapore, Malaysia, Thailand, Myanmar, and Vietnam the gender differential is absent or extremely low. A gender differential equal or higher than 5 percentage points is registered by Indonesia, Laos and Cambodia.

In order to better evaluate the knowledge structure of each country and the different options it opens for the future, it is important to consider separately the percentages of men and women with secondary and tertiary education (Graphs 10 and 11).

The two rankings suggest that Singapore[40] and Philippines (and in some measure also Laos) have been specializing in tertiary education, while Malaysia and Indonesia have directed their efforts mainly toward secondary

[37] The source we have used (IIASA) does not provide data for Brunei and similar data are not available at the national level.

[38] More data for men and women, in 1970 and 2007, together with mean number of year of study is reported in table 10 of the Statistical Annex.

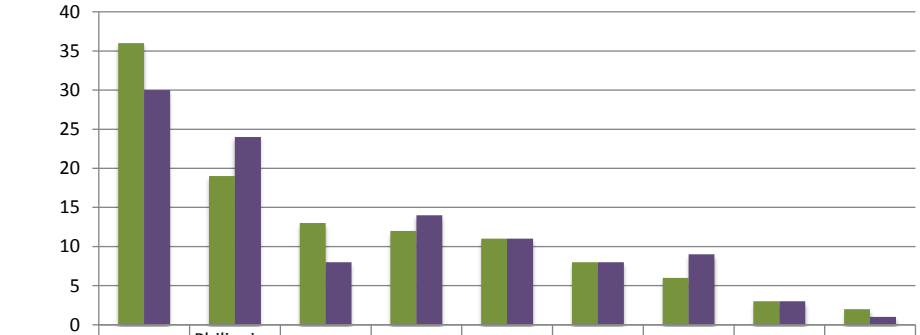
[39] The ranking of Vietnam is penalized by its gender unbiased approach to education. Laos and Cambodia are in fact characterized by a slight higher percentage of men, but by a much lower percentage of women with at least secondary education.

[40] To better evaluate the attainment of Singapore we recall that in Korea and Japan the percentages of men with tertiary education are 39 and 42 per cent.

education. Thailand and Myanmar are slightly behind, but seem to be proceeding in a balanced way, while Cambodia and Vietnam are still characterized by a heavy delay particularly relevant for tertiary education.

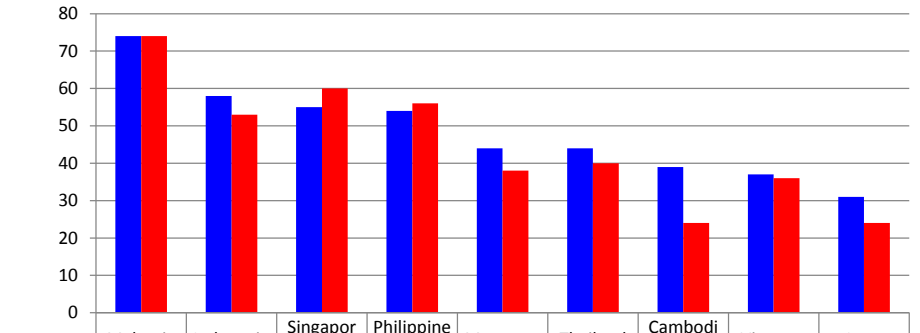
In conclusion, these data suggest that in Cambodia, Laos, and Vietnam the Labor force is still characterized by capabilities that provide options mainly in low and medium technology clusters, while Malaysia and also, although in a more limited way, Indonesia have already shifted or are ready to shift to higher technology cluster. The educational attainment of Singapore and Philippines suggests that tertiary activities are the best options for both countries that however are also equipped for high technology manufacturing clusters. Finally, Thailand and possibly Myanmar seem to have the option to operate in services and manufacturing sectors adopting intermediate technologies.

Graph 10 - ASEAN countries; men and women (15-44) with tertiary education; percentage values; 2007



	Singapore	Philippines	Laos	Thailand	Malaysia	Indonesia	Myanmar	Vietnam	Cambodia
Men	36	19	13	12	11	8	6	3	2
Women	30	24	8	14	11	8	9	3	1

Graph 11 - ASEAN countries; men and women (15-44) with secondary education; percentage values; 2007



	Malaysia	Indonesia	Singapore	Philippines	Myanmar	Thailand	Cambodia	Vietnam	Laos
Men	74	58	55	54	44	44	39	37	31
Women	74	53	60	56	38	40	24	36	24

Source – IIASA, 2008

Although not too recent, UNIDO data on competitiveness and on the share of medium-high tech value added in manufacturing give support to this analysis (Table 16). Singapore (that is world leader in competiveness) has by far the largest share of high technology products, followed in both ranking by Malaysia. The next two countries are Philippines and Thailand, followed by Indonesia. It is of interest to observe that these ranking correspond to the ranking by educational attainment.

Table 16 - ASEAN countries; Competitive Industrial Performance Index and Share of medium-high tech Value Added in manufacturing; 2007

Country	Competitive industrial Performance Index	World ranking	Country	Share of medium-high tech Value Added in Manufacturing
Singapore	0.895	1	Singapore	77.58
Malaysia	0.474	19	Malaysia	49.85
Thailand	0.407	28	Philippines	40.09
Philippines	0.400	32	Thailand	37.84
Indonesia	0.264	47	Indonesia	29.79
Viet Nam	0.193	72	Viet Nam	21.86
Cambodia	0.155	90	Cambodia	0.26
Source - UNIDO				

A final element to complete the picture of educational attainment and its future evolution is offered by public expenditure on education and its distribution by educational level (table 17). Malaysia is the country that at present devotes it largest share of GDP to education, followed by Vietnam, both countries boasting a percentage above 5 per cent. With percentages between 4 and 5 we find Indonesia and Thailand, the only two ASEAN countries that devote more than 1/5 of government expenditures to education.

To appreciate the countries' perception of their educational needs we can also observe that Cambodia, whose primary schools are affected by a very high dropout rate, are giving high priority to this educational level. A similar balanced vision of an education structure progressively built from the bottom, seems to be followed also by Indonesia and Philippine. Brunei and Malaysia are now concentrating their effort primarily on secondary education, while Singapore continues its efforts to create a highly educated work force.

Table 17 - ASEAN countries; Public expenditure on education and distribution by educational level; 2007

	Public expenditure on education as % of		Percentage of Public Expenditure by Educational Level				
	GDP	Gov. Expend.	Pre-primary	Primary	Secondary	Tetiary	Unknown
Malaysia	5.8	18.9	1	35	46	18	
Viet Nam	5.3	19.8	5	38	26	22	9
Indonesia	4.6	26.0	1	57	32		10
Thailand	4.1	20.8	7	48	16	17	13
Laos	3.3	13.2	3	46			51
Singapore	3.1	11.6	0	20	33	36	11
Philippines	2.7	16.9	2	52	27	10	10
Cambodia	2.6	12.4	1	73	21	5	
Brunei Darussalam	2.1	13.7	0	29	47	24	
Myanmar	1.3	18.1	0	48	40	12	
Source - IIASA							

10 SUMMARY AND POLICY SUGGESTIONE

10.1 The main conclusions

In the first part of the paper we have shown that the demographic revolution has already been affecting all ASEAN countries for a considerable period of time. The different intensity of economic growth, historical circumstances, prevailing values and customs have, however, interacted with demographic trends so that each country is at a different stage of this complex process. From our perspective the most interesting element is that Singapore, Thailand, Malaysia and Brunei have already been characterized by a relevant lack of labor supply that has provoked -and has been compensated by- the arrival of at least 10 million migrants, many of them from other ASEAN countries. At the same time, other migrants have left ASEAN countries, mainly Indonesia and Philippines, for non-ASEAN arrival countries.

We have also argued that in ASEAN arrival countries the need of foreign labor will progressively increase. This will depend both on the supply and on the demand side of the labor market. In the first place, the supply of local labor will necessarily decline for at least thirty, forty years. This will be caused by the decline in WAP brought about, on one hand, by the contraction in generational entries and, on the other, by the increase in generational exits. Both trends are unavoidable, being generated by structural phenomena, respectively the decline in fertility and ageing[41]. The exact dimension of the manpower needs and of the amount of migrants will, however, depend on the rate of growth of GDP that each economy will register and on the development path they will choose, which will determine the employment-income elasticity.

[41] The young people that will enter the Labor force in the next 20 years are already born and not big changes in the number of births can be forecasted in the next 10-15 years. The age structure of the Labor force is known and therefore generational exits from the labor market can also be easily estimated.

Finally, we have shown that in Singapore, Thailand and Malaysia the structural lack of labor supply:

- In the short run, cannot be counterbalanced by absorbing unemployment or increasing labor market participation, since unemployment is very low and participation very high or not expandable for cultural reasons;
- In the long run, it cannot be dealt with by delocalizing production and/or by increasing productivity, given the size and the expected duration of the phenomenon.

On the basis of the previous line of reasoning we have proposed and estimated labor market and demographic scenarios in which the migration flows and the demographic evolution of the arrival countries depend on their manpower needs. The results project a demographic future very different from that proposed by the Population Division, whose estimates appear to be more sensitive to the political stance of the interested countries than to economic logic.

The main conclusion is rather straightforward: the higher the rate of economic growth that will be attained by Singapore, Thailand, Malaysia, and Brunei, the higher their need of foreign labor, not only in absolute terms, but also as a percentage of the labor demand in terms of flow. [42] Our model shows that in a very near future the local supply of labor will not be sufficient even to offset Replacement demand. In substance, the paper supports the idea that growing workers mobility within the ASEAN community will represent an unavoidable precondition for economic growth and social development.

In the following section of the paper, a survey of the relevant literature has brought us to support the idea that economic growth is the result of a process of technological upgrading, of diversification and structural change driven by the accumulation of capabilities, on one hand, and the transformation of the production structure, on the other. In substance, according to this perspective, it is the knowledge base of a country that defines and limits the technologies a country can adopt, the production structure it may evolve, and therefore the possible paths to economic growth and social development. More specifically, speeding up economic growth and triggering successful catching up processes does require shifting production from low quality activities into "high quality activities", in other words to *jump* into new knowledge clusters. In order to do so a country needs to drive its knowledge structure toward higher diversity and complexity; in other words to endow its incoming labor force with the expertise and competences that will be required by the economic development triggered by industrial policies, and this in coordination with the necessary industrial policies.

Finally the paper has provided some information on the educational attainment of the younger components of WAP in each ASEAN country. Data show that, also in this case, ASEAN presents a very articulated reality,

[42] The labor demand in terms of flow is measured by the new entries in the labor market necessary i) to substitute the people that leave the Labor force for good and ii) to occupy the additional jobs generated by economic growth

but also a remarkable coherence between, on one hand, the educational attainment structure and, on the other, the level of development as well as the structure of the industrial and service sectors. The percentage of people between 15-44 with secondary and tertiary education spans between the maximum of Singapore (around 90 per cent) and the minimum values that characterize Laos, Cambodia, and Vietnam (between 40 and 45 per cent). Coherently, while Singapore has the world highest ranking in Industrial performance, Malaysia and Indonesia have already shifted their production structure to high quality activities and new knowledge cluster, or are ready to do so. On the other end, Cambodia and Vietnam are still attracting foreign investments mainly in labor intensive, low technology sectors.

In conclusion, the paper contends that, in a very near future, workers mobility within ASEAN will not be a choice, but a necessity imposed by demographic tendencies and economic growth. The pace of economic growth and the typology of development will determine the amount of Labor force that will be needed and the competencies and skills requested by the arrival countries. At the same time, the other ASEAN countries will have a structural excess of labor supply that will not be able to find a productive occupation in the national markets because the rate of growth requested to absorb it will remain out of reach.

It could be ASEAN goal to transform these weaknesses into strong points.

10.2 Some policy suggestions

The structural lack of labor supply that will affect Singapore, Thailand and, in a lesser measure, Malaysia can be faced only in two ways: migration and delocalization of production. The second approach, although viable from an economic perspective, can provide only a very partial solution to the expansion of production, given its risks and serious political drawbacks.

A correct migration policy can be based only upon a serious evaluation of the amount and typology of workers needed by the arrival countries[43]. It must be underlined that the more economically and socially developed economies do not need *only* skilled labor, but on the contrary - especially at the beginning of the migration process- they need *mainly* unskilled labor. The reason is quite obvious. As income per-capita increases, families will tend to provide more education to their children. The result is that the young generations that will enter the labor market in the near future in the most developed areas of ASEAN will not be willing to accept low-paid menial jobs, which remain abundant also in developed economies, especially in the service sectors. However, with time, the percentage of qualified workers and university graduates needed by these economies will progressively grow, as the percentage of migrants requested in order to face local labor demand will increase[44].

[43] Another extremely important element will be represented by a system of recognition of skill certificates and credentials within and among countries in the ASEAN region.
[44] For Singapore, see Brenda S.A. Yeoh, 2007

The other side of the coin is that migrations have both positive and negative impacts on the socio-economic systems of departure countries. On one hand, it can reduce the pressure on the supply side of the labor market and provide remittances that could, if properly directed, support productive investments. On the other hand, migration depletes the knowledge structure and the capabilities of departure countries because migrants are by definition the most dynamic elements of their societies.

As it has already been suggested, a correct approach to economic growth and catching up requires that educational policies and industrial policies be called to play a fundamental role. At national level, this implies that education and training policies should have both a short-run and a long-run objective: 1) in the short-run, provide a correct response to the local labor demand in terms of skills; 2) in the long-run, endow the incoming generations with the knowledge and the skills necessary to move the national production structure toward higher quality products. In order to avoid unemployment and frustrations, this second objective does however need a coordinated set of industrial policies that will create the demand for graduates with higher skills. In substance, education and vocational training policies should prepare the people for the production structure that is going to be promoted by industrial policies.

At ASEAN level the implication is that the educational policies of the departures countries should be coordinated also with the industrial policies of the arrival countries so that the unavoidable structural excess of labor of departures countries will find productive employment or in the arrival countries or in their investment in departures countries. These coordinated efforts will progressively lead toward a common market of the factors of production[45].

A basic element for designing and implementing the previous complex set of measures is information. Many ASEAN countries still lack the statistical information on demography, education, vocational training, labor market and migration[46] that represents the necessary prerequisite to design and implement the policies we have just outlined. Moreover, this information needs to be comparable and based upon best international practices.

This suggests that a fist important measure that could be implemented by ASEAN is the creation of an ASEAN Labor Market Information System[47]. As shown in Figure 2, a LMIS can be thought as:

- A network of producers and consumers of Labor Market Information
- A store of Labor Market Information

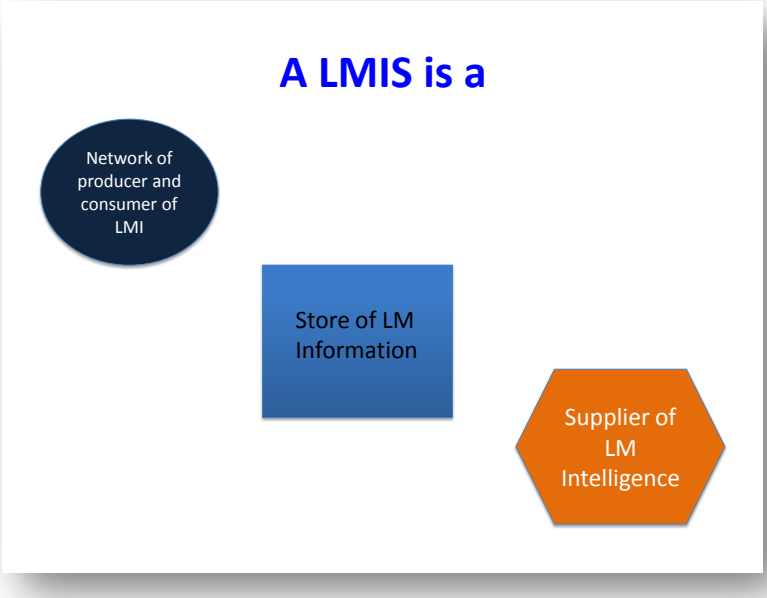
[45] Already the "**ASEAN Labor Ministers' Work Program 2000 to 2005"** stated that ASEAN countries need to enhance capacity for formulating and implementing a comprehensive and integrated human resource development (HRD) strategy on a continuous basis in order to adjust to global competition. This will include, among other things, a coordinated employment, manpower education and training programs, planning, labor policy measures and labor market information programs.

[46] The problem is fully recognized by the ALM last Work program that states: "Although human resource development planning and labor market information and analysis is a stated priority area for ASEAN, comprehensive information on the structure of ASEAN Member States' labor sectors remains of limited availability.

[47] The ASEAN LMIS would also respond to one of the priorities of the ALM work program, labor market monitoring.

- A supplier of Labor Market Intelligence

Figure 2



The first element put the accent on the fact that the ASEAN LMIS should be the expression of its stakeholders, i.e. the national producers and consumers of data. The former will provide the necessary statistical information and support their correct interpretation; the latter will indicate their needs and cooperate in directing the collection of data and the management of the system.

The second element indicates that the ASEAN LMIS should be the physical place where all the relevant national labor market information will be mapped, collected, evaluated, organized and stored.

Finally, the real justification of the ASEAN LMIS is that of providing a flow of structural and short-run analyses needed to design, implement and monitor the educational, industrial, and migration policies of ASEAN countries. Between the more relevant areas of analysis we can indicate:

- The education and vocational training systems of the ASEAN countries: in order to assess their structural characteristics and their evolution; estimate their production in terms of students outflows classified in regular and irregular, and by educational level;
- The transition process from the Educational and Vocational Training System, on one hand, and the Labor Market, on the other;
- The labor markets of the ASEAN countries in a comparative perspective;
- Internal and external migration flows.

In a more specific way the LMIS should provide the necessary inputs

- To design a framework of educational policies and industrial policies to be proposed to member countries for approval and implementation;
- To create and up-keep labor market and demographic scenarios of the type we have just shown;
- To design a map of the excess of labor supply in departures countries;
- To define the manpower needs of arrival countries, by occupations and skills.

In particular, the scenarios should provide estimates, over a 5-10 year sliding horizon, of the level and skill structure of the manpower needs of arrival countries, on one hand, and of the structural excess of labor supply of departures countries, on the other.

10.3 The Education Migration Fund

There is a final suggestion we deem relevant to advance on the eve of the creation of an integrated economic community that will progressively allow the free movement of capital and labor.

A migrant bring with him a "capital" of capabilities that is the result not only of its personal investment, but also of the public investments of its country of origin. In substance, the arrival of a migrant corresponds for the production system of the receiving country to the free acquisition of a factor of production. This is obviously true only if and when the migrant worker is needed, i.e. his services are essential and do not have a substitute in the arrival country. The paper has strongly argued that this situation will exist and persist for at last four ASEAN countries and for a number of workers largely in excess of those "forecasted" by international Institutions.

This aspect of migration has been largely overlooked by the literature because migrations are still predominantly explained from the supply side, migrants being seen as people running away from misery and deprivation, if unskilled and with low education, and as people in search of a higher income and better life, if educated and skilled. This brings to stress the cost that the countries of arrival have to bear or to promote ideas of brotherhood toward the migrants and their needs.

If we abandon this perspective to realistically accept that in an increasing number of countries labor internally produced is not sufficient to carry on and expand production, and therefore that these countries need to acquire labor from other countries in the same way as they need to acquire raw materials and capital goods, then it logically follows that arrival countries should pay for each migrant that is going to have a job position a price proportional to its education and skill level and at least equal to the cost the departure country has supported to educate and train him[48].

Keeping in mind that:

- Migrants represent a depletion of the knowledge base of the departures countries;

[48] This would also eliminate market distortion deriving from the free acquisition of factors of production by arrival countries.

- A more educated and better trained labor force is the key for economic growth;
- The need for foreign labor will dramatically increase at least for the next forty years;
- Population explosion will make more and more difficult if not impossible the development of the poorest countries in the world where the excess of labor supply will be progressively concentrated;

the creation and correct utilization of an Education Migration Fund could activate a relevant, correct, and equitable transfer of money from the rich to the poor countries to be invested in the most important factor of economic growth and social development: ***education***[49].

It is evident that even if accepted the implementation of this proposal would have to face a series of complicated issues that cannot be confronted in this paper. Here we can limit ourselves to a few suggestions.

In a global perspective we could envisage the constitution of an **Education Migration Fund** (EMF) with UNESCO that could be in charge to collect the payments from arrival countries and route them toward departure countries. This should be done in a fast and efficient way, and following a plan agreed upon with departure countries. The money should be directed to build new schools, improve the existing building, train the teachers, provide equal opportunities, and promote gender equality, in coordination with the industrial and macroeconomic policies required to start effective catching up processes.

ASEAN countries are committed to "enhance and improve the capacity of ASEAN human resources through strategic programs, and to develop a qualified competent and well-prepared ASEAN labor force that would benefit from as well as cope with the challenges of regional integration"[50]. It is evident that in the less developed countries the necessary improvement of the educational and vocational training system finds an upper limit in the existing, largely insufficient resources. The adoption of the previous proposal could provide a correct and equitable solution to this problem. Moreover it could be argued that in the growth perspective we have adopted, arrival countries would be a final beneficiary of the transfers because the same transfers would foster the process of catching up of the weaker economies, increase their level of per-capita income and therefore expand their market for foreign high quality products and services.

In this perspective ASEAN could represent an ideal testing ground of this measure. A specific working group of ASEAN experts could be entrusted with the development and implementation of the idea. Also in this case, the final goal would be the constitution of a EMF to which arrival

[49] What we propose is totally different from the so-called Bhagwati tax. In the first place, the argument advanced, almost 40 years ago by Bhagwaty and Dellafar (Bhagwati, Jagdish N., and Dellafar, 1973) calls for a tax on the incomes of "professional emigrants" from developing countries into developed countries. In the second place, the Bhagwati proposal refers only to the so called brain drain. Finally it is a typical expression of a supply side vision of the migration process. It can also be reminded that initially, also Bhagwati discussed methods for transferring income from developed countries to developing countries to compensate the latter for losses caused by the brain drain (Bhagwati and Hamada, 1974, 1975). For a more detailed discussion of the Bhagwati tax, see Wilson John Douglas, 2005

[50] ASEAN Socio-Cultural Community Blueprint

countries would transfer their payments that would then be directed toward the departure countries, in accordance with educational plans agreed upon by ASEAN and the individual countries and in coherence with the national and ASEAN training needs.

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Statistical Annex

Table A1 - Number of arrival and departure countries; emigration and immigration by continent and area; values in milion: 1950-60 and 2000-10

	N. countries	N. countries with positive migration balances	N. countries with negative migration balances	Positive migration balances	Negative migration balances	Net migration balance
	1950-1960					
Europe	40	13	26	3.0	-7.8	-4.9
New World countries	4	4		5.1		5.1
Asia	50	20	21	3.8	-2.2	1.6
South America and Carebbean	37	11	22	1.4	-1.9	-0.5
Africa	55	13	29	0.8	-2.1	-1.3
Oceania	10	1	7	0.0	0.0	0.0
Total	196	62	105	14.1	-14.1	0.0
Intercontinenatal flows, ab. value				6.7		
Intercontinenatal flows, %				47.7		
	2000-2010					
Europe	40	27	13	20.1	-1.8	18.3
New world countres	4	4	0	15.3		15.3
Asia	50	21	27	14.2	-30.6	-16.4
Gulf countries	*6*	*6*		*8.7*		
South America and Carebbean	37	8	28	0.4	-11.6	-11.2
Africa	55	16	36	3.9	-10.2	-6.3
Oceania	10	2	5	0.0	-0.2	-0.1
Total	196	78	109	53.9	-54.3	-0.4
Intercontinenatal flows, ab. value				33.7		
Intercontinenatal flows, %				62.4		

Source: our elaboration on data PD, 2011

Table. A2 -Migration balance of the first 25 arrival and departure countries; 2000-2010; thousand

Departure countries	Migration balance	Arrival countries	Migration balance
United States of America	11,150	India	-4,923
Spain	5,079	Mexico	-4,401
United Arab Emirates	3,857	Bangladesh	-4,401
Italy	3,853	China	-4,182
Saudi Arabia	2,781	Pakistan	-3,750
Russian Federation	2,700	Indonesia	-2,477
Canada	2,187	Philippines	-2,361
United Kingdom	1,989	Zimbabwe	-1,600
Australia	1,786	Myanmar	-1,500
Thailand	1,595	Peru	-1,350
South Africa	1,400	Morocco	-1,289
Germany	1,319	Uzbekistan	-1,274
France	1,266	Brazil	-1,000
Qatar	1,027	Côte d'Ivoire	-870
Singapore	954	Viet Nam	-863
Afghanistan	585	Iraq	-730
Burundi	570	Guinea	-725
Sierra Leone	560	Tajikistan	-718
Syrian Arab Republic	492	Egypt	-718
Malaysia	481	El Salvador	-647
Bahrain	473	United Republic of Tanzania	-645
Kuwait	439	Ethiopia	-640
Sweden	421	Somalia	-500
Belgium	396	Guatemala	-500
Austria	380	Republic of Moldova	-492
Total	47,741	Total	-42,558

Table. A3 - Asia; arrival and daparture countries; migration balance; 2000-2010; thousand			
Departure countries	Migration balance	Arrival countries	Migration balance
United Arab Emirates	3,857	India	-4,923
Saudi Arabia	2,781	Bangladesh	-4,401
Thailand	1,595	China	-4,182
Qatar	1,027	Pakistan	-3,750
Singapore	954	Indonesia	-2,477
Afghanistan	585	Philippines	-2,361
Syrian Arab Republic	492	Myanmar	-1,500
Malaysia	481	Uzbekistan	-1,274
Bahrain	473	Viet Nam	-863
Kuwait	439	Iraq	-730
Israel	377	Tajikistan	-718
Japan	322	Georgia	-459
China, Hong Kong SAR	165	Kyrgyzstan	-381
Jordan	109	Cambodia	-373
Azerbaijan	107	Sri Lanka	-350
Cyprus	106	Occupied Palestinian Territory	-280
Oman	103	Yemen	-235
China, Macao SAR	93	Kazakhstan	-214
Lebanon	88	Nepal	-200
Bhutan	52	Lao People's Democratic Republic	-190
Brunei Darussalam	7	Armenia	-175
Dem. People's Republic of Korea	0	Turkmenistan	-168
Maldives	0	Turkey	-150
Total	14,213	Republic of Korea	-128
PdG	8,681	Iran (Islamic Republic of)	-60
		Mongolia	-30
		Timor-Leste	-10
		Total	-30,583
Source: our elaboration on data PD, 2011			

Table A4 - Thailand - Labour market and demographic sceanarios 2010-35

	WAP		WAP change	Migr 5 year UNPD hypothesis)	WAP change - Migration	rate of participation	Change in LF	Rate of change in employment	Change in employment level	Employment	Total Manpower Needs (5 years)	Total Manpower Needs (yearly average)
		Scenario A										
2005	48942									35257		
2010	52856	2005-2010	3914	490	3424	72.7	2490	7.9	2780	38037	290	58
2015	55379	2010-2015	2,523	395	2,128		1,547	7.9	2,999	41,037	1,452	290
2020	57408	2015-2020	2,030	390	1,640		1,193	7.9	3,236	44,273	2,043	409
2025	58778	2020-2025	1,370	385	985		716	7.9	3,491	47,764	2,775	555
2030	59607	2025-2030	829	385	444		323	7.9	3,766	51,530	3,444	689
2035	59885	2030-2035	278	380	-102		-74	7.9	4,063	55,593	4,138	828
			7,029	1,935	5,094		3,705		17,556		13,851	554
									0.461549178		36.41538221	
	WAP		WAP change	Migr 5 year UNPD hypothesis)	WAP change - Migration Balance	rate of participation	Change in LF	Rate of change in employment over a 5 year period	Change in employment level	Employment	Total Manpower Needs (5 years)	Total Manpower Needs (yearly average)
		Scenario B										
2005	48942									35257		
2010	52856	2005-2010	3914	490	3424	72.7	2490	7.9	2780	38037	290	58
2015	55379	2010-2015	2523	395	2128		1547	7.3	2780	40818	1233	247
2020	57408	2015-2020	2030	390	1640		1193	6.8	2780	43598	1588	318
2025	58778	2020-2025	1370	385	985		716	6.4	2780	46378	2064	413
2030	59607	2025-2030	829	385	444		323	6.0	2780	49158	2457	491
2035	59885	2030-2035	278	380	-102		-74	5.7	2780	51938	2854	571
			7029	1935	5094		3705		13901		10196	408

Table A5 - Thailand; population by main age group and rate of employment in alternative scenarios of migration; 2010-2035													
Scenario A	0-14	15 +			Total population			Percentage of people 0-14			Rate of employment		
		B=1	B=1.15	B=1.30	B=1	B=1.15	B=1.30	B=1	B=1.15	B=1.30	B=1	B=1.15	B=1.30
2010	14,195	52,856	52,856	52,856	67,051	67,051	67,051	21.2	21.2	21.2	72.0	72.0	72.0
2015	13,326	56,436	56,973	57,510	69,762	70,299	70,836	19.1	19.0	18.8	72.7	72.0	71.4
2020	12,359	60,119	61,208	62,298	72,478	73,567	74,657	17.1	16.8	16.6	73.6	72.3	71.1
2025	11,592	63,879	65,532	67,185	75,471	77,124	78,777	15.4	15.0	14.7	74.8	72.9	71.1
2030	11,093	67,766	70,002	72,239	78,859	81,095	83,332	14.1	13.7	13.3	76.0	73.6	71.3
2035	10,831	71,801	74,643	77,485	82,632	85,474	88,316	13.1	12.7	12.3	77.4	74.5	71.7
Diff.	-3,364	18,945	21,787	24,629	15,581	18,423	21,265						
Scenario B													
2010	14,195	52,856	52,856	52,856	67,051	67,051	67,051	21.2	21.2	18.9	72.0	72.0	72.0
2015	13,326	56,216	56,720	57,225	69,542	70,046	70,551	19.2	19.0	18.9	72.6	72.0	71.3
2020	12,359	59,444	60,432	61,420	71,803	72,791	73,779	17.2	17.0	16.8	73.3	72.1	71.0
2025	11,592	62,493	63,938	65,384	74,085	75,530	76,976	15.6	15.3	15.1	74.2	72.5	70.9
2030	11,093	65,394	67,275	69,155	76,487	78,368	80,248	14.5	14.2	13.8	75.2	73.1	71.1
2035	10,831	68,146	70,440	72,733	78,977	81,271	83,564	13.7	13.3	13.0	76.2	73.7	71.4
Diff.	-3,364	15,290	17,584	19,877	11,926	14,220	16,513						

Table A6 - Singapore - Labour market and demographic sceanarios 2010-35

	WAP		WAP change	Migr 5 year UNPD hypothesis)	WAP change - Migration Balance	rate of participation	Change in LF	Rate of change in employment over a 5 year period	Change empl	Employment	Total Manpower Needs (5 years)	Total Manpower Needs (yearly average)
		Scenario A										
2005	3426		353	230	123							
2010	4196	2005-2010	770	720	50	74.7	37.3		781	3047	743.2	
2015	4582	2010-2015	386	175	211		158	22.7	693	3740	535	107
2020	4817	2015-2020	235	125	110		82	22.7	850	4590	768	154
2025	4965	2020-2025	148	125	23		17	22.7	1043	5634	1026	205
2030	5097	2025-2030	132	120	12		9	22.7	1281	6914	1272	254
2035	5197	2030-2035	100	120	-20		-15	22.7	1572	8486	1587	317
			1001	665	336		251		5439		5188	208

	WAP		WAP change	Migr 5 year UNPD hypothesis)	WAP change - Migration	rate of participation	Change in LF	Rate of change in employment over a 5 year	Change empl	Employment	Total Manpower Needs (5	Total Manpower Needs (yearly
		Scenario B										
2005	3426		353	230	123							
2010	4196	2005-2010	770	720	50	74.7	37.3		781	3047	743.2	
2015	4582	2010-2015	386	175	211		158	25.6	781	3828	623	125
2020	4817	2015-2020	235	125	110		82	20.4	781	4608	698	140
2025	4965	2020-2025	148	125	23		17	16.9	781	5389	763	153
2030	5097	2025-2030	132	120	12		9	14.5	781	6169	772	154
2035	5197	2030-2035	100	120	-20		-15	12.7	781	6950	795	159
			1001	665	336		251		3903		3652	146

	WAP		WAP change	Migr 5 year UNPD hypothesis)	WAP change - Migration	rate of participation	Change in LF	Rate of change in employment over a 5 year	Change empl	Employment	Total Manpower Needs (5	Total Manpower Needs (yearly
		Scenario C										
2005	3426		353	230	123							
2010	4196	2005-2010	770	720	50	74.7	37.3		781	3047	743.2	
2015	4582	2010-2015	386	175	211		158	22.7	693	3740	535	107
2020	4817	2015-2020	235	125	110		82	11.4	425	4165	343	69
2025	4965	2020-2025	148	125	23		17	5.7	237	4402	220	44
2030	5097	2025-2030	132	120	12		9	2.8	125	4527	116	23
2035	5197	2030-2035	100	120	-20		-15	1.4	64	4591	79	16
			1001	665	336		251		1544		1293	52

Table A7 - Singapore; population by main age group and rate of employment in alternative scenarios of migration; 2010-2035													
Scenario A	0-14	15 +			Total population			Percentage of people 0-14			Rate of employment		
		B=1	B=1.15	B=1.30	B=1	B=1.15	B=1.30	B=1	B=1.15	B=1.30	B=1	B=1.15	B=1.30
2010	884	4,196	4,196	4,196	5,080	5,080	5,080	17.4	17.4	17.4	72.6	72.6	72.6
2015	783	4,942	5,054	5,166	5,725	5,837	5,949	13.7	13.4	13.2	75.7	74.0	72.4
2020	772	5,820	6,064	6,307	6,592	6,836	7,079	11.7	11.3	10.9	78.9	75.7	72.8
2025	821	6,869	7,270	7,671	7,690	8,091	8,492	10.7	10.1	9.7	82.0	77.5	73.4
2030	866	8,153	8,747	9,340	9,019	9,613	10,206	9.6	9.0	8.5	84.8	79.0	74.0
2035	886	9,720	10,548	11,377	10,606	11,434	12,263	8.4	7.7	7.2	87.3	80.4	74.6
Diff.	2	5,524	6,352	7,181	5,526	6,354	7,183						
Scenario B													
2010	884	4,196	4,196	4,196	5,080	5,080	5,080	17.4	17.4	12.9	72.6	72.6	72.6
2015	783	5,030	5,155	5,280	5,813	5,938	6,063	13.5	13.2	12.9	76.1	74.3	72.5
2020	772	5,838	6,085	6,331	6,610	6,857	7,103	11.7	11.3	10.9	78.9	75.7	72.8
2025	821	6,625	6,989	7,353	7,446	7,810	8,174	11.0	10.5	10.0	81.3	77.1	73.3
2030	866	7,408	7,890	8,372	8,274	8,756	9,238	10.5	9.9	9.4	83.3	78.2	73.7
2035	886	8,184	8,782	9,380	9,070	9,668	10,266	9.8	9.2	8.6	84.9	79.1	74.1
Diff.	2	3,988	4,586	5,184	3,990	4,588	5,186						
Scenario C													
2010	884	4,196	4,196	4,196	5,080	5,080	5,080	17.4	17.4	13.2	72.6	72.6	72.6
2015	783	4,942	5,054	5,166	5,725	5,837	5,949	13.7	13.4	13.2	75.7	74.0	72.4
2020	772	5,395	5,575	5,755	6,167	6,347	6,527	12.5	12.2	11.8	77.2	74.7	72.4
2025	821	5,638	5,854	6,070	6,459	6,675	6,891	12.7	12.3	11.9	78.1	75.2	72.5
2030	866	5,766	6,001	6,237	6,632	6,867	7,103	13.1	12.6	12.2	78.5	75.4	72.6
2035	886	5,825	6,069	6,314	6,711	6,955	7,200	13.2	12.7	12.3	78.8	75.6	72.7
Diff.	2	1,629	1,873	2,118	1,631	1,875	2,120						

Table A8 - Malaysia - Labour market and demographic sceanarios 2010-35

	WAP		WAP change	Migr 5 year UNPD hypothesis)	WAP change - Migration Balance	rate of participation	Change in LF	Rate of change in employment over a 5 year period	Change empl	Employment	Total Manpower Needs (5 years)	Total Manpower Needs (yearly average)
2000	14612	**Scenario A**										
2005	16451		1839	395	1444	63.3	857		776.2	10045	-81	-16
2010	18369	2005-2010	1918	85	1833	62.7	1103.8	10.8	1084	11129	-19.8	-4
2015	20438	2010-2015	2070	85	1985		1244	10.8	1201	12330	-43	-9
2020	22537	2015-2020	2098	85	2013		1262	10.8	1331	13661	68	14
2025	24402	2020-2025	1865	85	1780		1116	10.8	1474	15135	358	72
2030	26200	2025-2030	1798	85	1713		1074	10.8	1633	16768	559	112
2035	27914	2030-2035	1714	85	1629		1022	10.8	1809	18578	788	158
			9545	425	9120		5718		7448		1730	326
									66.9254611			

Malaysia

Scenario contant employmnt growth = value last 5 years

	WAP		WAP change	Migr 5 year UNPD hypothesis)	WAP change - Migration Balance	rate of participation	Change in LF	Rate of change in employment over a 5 year period	Change empl	Employment	Total Manpower Needs (5 years)	Total Manpower Needs (yearly average)
		Scenario B										
2005	16451		1839	395	1444	63.3	857		776	10045	-81	-16
2010	18369	2005-2010	1918	85	1833	62.7	1103.8	10.8	1084	11129	-19.8	-4
2015	20438	2010-2015	2070	85	1985		1244	9.7	1084	12233	-160	-32
2020	22537	2015-2020	2098	85	2013		1262	8.9	1084	13337	-178	-36
2025	24402	2020-2025	1865	85	1780		1116	8.1	1084	14441	-32	-6
2030	26200	2025-2030	1798	85	1713		1074	7.5	1084	15545	10	2
2035	27914	2030-2035	1714	85	1629		1022	7.0	1084	16648	62	12
			9545	425	9120		5718		5420		-399	-80

Table A9 - Malaysia; population by main age group and rate of employment in alternative scenarios of migration; 2010-2035													
Scenario A	0-14	15 +			Total population			Percentage of people 0-14			Rate of employment		
		B=1	B=1.15	B=1.30	B=1	B=1.15	B=1.30	B=1	B=1.15	B=1.30	B=1	B=1.15	B=1.30
2010	8,617	18,369	18,369	18,369	26,986	26,986	26,986	31.9	31.9	31.9	60.6	60.6	60.6
2015	8,671	20,310	20,601	20,892	28,981	29,272	29,563	29.9	29.6	29.3	60.7	59.9	59.0
2020	8,674	22,392	22,995	23,598	31,066	31,669	32,272	27.9	27.4	26.9	61.0	59.4	57.9
2025	8,848	24,530	25,454	26,378	33,378	34,302	35,226	26.5	25.8	25.1	61.7	59.5	57.4
2030	8,971	26,802	28,067	29,332	35,773	37,038	38,303	25.1	24.2	23.4	62.6	59.7	57.2
2035	9,006	29,219	30,847	32,474	38,225	39,853	41,480	23.6	22.6	21.7	63.6	60.2	57.2
Diff.	389	10,850	12,478	14,105	11,239	12,867	14,494						
Scenario B													
2010	8,617	18,369	18,369	18,369	26,986	26,986	26,986	31.9	31.9	31.9	60.6	60.6	60.6
2015	8,671	20,193	20,467	20,740	28,864	29,138	29,411	30.0	29.8	29.5	60.6	59.8	59.0
2020	8,674	22,028	22,577	23,126	30,702	31,251	31,800	28.3	27.8	27.3	60.5	59.1	57.7
2025	8,848	23,776	24,587	25,398	32,624	33,435	34,246	27.1	26.5	25.8	60.7	58.7	56.9
2030	8,971	25,499	26,568	27,638	34,470	35,539	36,609	26.0	25.2	24.5	61.0	58.5	56.2
2035	9,006	27,191	28,514	29,837	36,197	37,520	38,843	24.9	24.0	23.2	61.2	58.4	55.8
Diff.	389	8,822	10,145	11,468	9,211	10,534	11,857						

Table A10 - ASEAN countries; Men and women aged 25-44; educational attainment by sex; 2007											
		Women aged 25-44					Men aged 25-44				
		No education	Primary	Secondary	Tertiary	Mean year of schooling	No education	Primary	Secondary	Tertiary	Mean year of schooling
Cambodia	1970	66	30	3	0	1.7	25	57	18	0	4.5
	2007	20	55	24	1	5	11	47	39	2	6.4
	Diff	*-46*	*25*	*21*	*1*	*3.3*	*-14*	*-10*	*21*	*2*	*1.9*
Indonesia	1970	42	38	20	0	3.9	18	51	29	2	5.6
	2007	2	37	53	8	8.6	1	33	58	8	8.9
	Diff	*-40*	*-1*	*33*	*8*	*4.7*	*-17*	*-18*	*29*	*6*	*3.3*
Laos	1970	75	23	1	0	1.2	36	48	15	2	4
	2007	28	40	24	8	5.4	15	41	31	13	7.1
	Diff	*-47*	*17*	*23*	*8*	*4.2*	*-21*	*-7*	*16*	*11*	*3.1*
Malaysia	1970	39	30	30	1	4.8	19	38	40	2	6.5
	2007	4	11	74	11	10.5	3	12	74	11	10.5
	Diff	*-35*	*-19*	*44*	*10*	*5.7*	*-16*	*-26*	*34*	*9*	*4*
Myanmar	1970	39	44	16	1	3.3	20	53	26	1	4.7
	2007	14	39	38	9	6.6	9	40	44	6	6.9
	Diff	*-25*	*-5*	*22*	*8*	*3.3*	*-11*	*-13*	*18*	*5*	*2.2*
Philippines	1970	7	50	37	7	6.8	6	49	39	6	6.9
	2007	1	19	56	24	10	2	25	54	19	9.3
	Diff	*-6*	*-31*	*19*	*17*	*3.2*	*-4*	*-24*	*15*	*13*	*2.4*
Singapore	1970	47	12	39	2	4.5	30	15	50	5	6.2
	2007	4	6	60	30	10.5	3	6	55	36	10.8
	Diff	*-43*	*-6*	*21*	*28*	*6*	*-27*	*-9*	*5*	*31*	*4.6*
Thailand	1970	23	55	21	1	5.5	15	58	25	2	6.3
	2007	4	42	40	14	9.1	3	41	44	12	9.1
	Diff	*-19*	*-13*	*19*	*13*	*3.6*	*-12*	*-17*	*19*	*10*	*2.8*
Vietnam	1970	24	61	14	0	3.8	8	65	25	2	5.5
	2007	5	56	36	3	6.4	5	54	37	3	6.5
	Diff	*-19*	*-5*	*22*	*3*	*2.6*	*-3*	*-11*	*12*	*1*	*1*
China	1970	39	32	29	1	4.5	15	39	44	2	6.7
	2007	3	23	69	5	8.6	1	16	76	7	9.3
	Diff	*-36*	*-9*	*40*	*4*	*4.1*	*-14*	*-23*	*32*	*5*	*2.6*
Japan	1970		34	60	6	8.9		32	55	13	9.4
	2007		5	50	45	13.1		7	51	42	12.8
	Diff		*-29*	*-10*	*39*	*4.2*	*0*	*-25*	*-4*	*29*	*3.4*
Korea	1970	20	36	42	2	6.3	7	26	59	7	8.7
	2007	0	3	65	32	12.4	0	3	58	39	12.9
	Diff	*-20*	*-33*	*23*	*30*	*6.1*	*-7*	*-23*	*-1*	*32*	*4.2*
Source: International Institute for Applied System Analysis; Asian and Human Capital Data, Data sheet, 2008											

Statistical Annex

Table A1 - Number of arrival and departure countries; emigration and immigration by continent and area; values in milion: 1950-60 and 2000-10

	N. countries	N. countries with positive migration balances	N. countries with negative migration balances	Positive migration balances	Negative migration balances	Net migration balance
	1950-1960					
Europe	40	13	26	3.0	-7.8	-4.9
New World countries	4	4		5.1		5.1
Asia	50	20	21	3.8	-2.2	1.6
South America and Carebbean	37	11	22	1.4	-1.9	-0.5
Africa	55	13	29	0.8	-2.1	-1.3
Oceania	10	1	7	0.0	0.0	0.0
Total	196	62	105	14.1	-14.1	0.0
Intercontinenatal flows, ab. value				6.7		
Intercontinenatal flows, %				47.7		
	2000-2010					
Europe	40	27	13	20.1	-1.8	18.3
New world countres	4	4	0	15.3		15.3
Asia	50	21	27	14.2	-30.6	-16.4
Gulf countries	*6*	*6*		*8.7*		
South America and Carebbean	37	8	28	0.4	-11.6	-11.2
Africa	55	16	36	3.9	-10.2	-6.3
Oceania	10	2	5	0.0	-0.2	-0.1
Total	196	78	109	53.9	-54.3	-0.4
Intercontinenatal flows, ab. value				33.7		
Intercontinenatal flows, %				62.4		

Source: our elaboration on data PD, 2011

Table. A2 -Migration balance of the first 25 arrival and departure countries; 2000-2010; thousand

Departure countries	Migration balance	Arrival countries	Migration balance
United States of America	11,150	India	-4,923
Spain	5,079	Mexico	-4,401
United Arab Emirates	3,857	Bangladesh	-4,401
Italy	3,853	China	-4,182
Saudi Arabia	2,781	Pakistan	-3,750
Russian Federation	2,700	Indonesia	-2,477
Canada	2,187	Philippines	-2,361
United Kingdom	1,989	Zimbabwe	-1,600
Australia	1,786	Myanmar	-1,500
Thailand	1,595	Peru	-1,350
South Africa	1,400	Morocco	-1,289
Germany	1,319	Uzbekistan	-1,274
France	1,266	Brazil	-1,000
Qatar	1,027	Côte d'Ivoire	-870
Singapore	954	Viet Nam	-863
Afghanistan	585	Iraq	-730
Burundi	570	Guinea	-725
Sierra Leone	560	Tajikistan	-718
Syrian Arab Republic	492	Egypt	-718
Malaysia	481	El Salvador	-647
Bahrain	473	United Republic of Tanzania	-645
Kuwait	439	Ethiopia	-640
Sweden	421	Somalia	-500
Belgium	396	Guatemala	-500
Austria	380	Republic of Moldova	-492
Total	47,741	Total	-42,558

Table. A3 - Asia; arrival and daparture countries; migration balance; 2000-2010; thousand			
Departure countries	Migration balance	Arrival countries	Migration balance
United Arab Emirates	3,857	India	-4,923
Saudi Arabia	2,781	Bangladesh	-4,401
Thailand	1,595	China	-4,182
Qatar	1,027	Pakistan	-3,750
Singapore	954	Indonesia	-2,477
Afghanistan	585	Philippines	-2,361
Syrian Arab Republic	492	Myanmar	-1,500
Malaysia	481	Uzbekistan	-1,274
Bahrain	473	Viet Nam	-863
Kuwait	439	Iraq	-730
Israel	377	Tajikistan	-718
Japan	322	Georgia	-459
China, Hong Kong SAR	165	Kyrgyzstan	-381
Jordan	109	Cambodia	-373
Azerbaijan	107	Sri Lanka	-350
Cyprus	106	Occupied Palestinian Territory	-280
Oman	103	Yemen	-235
China, Macao SAR	93	Kazakhstan	-214
Lebanon	88	Nepal	-200
Bhutan	52	Lao People's Democratic Republic	-190
Brunei Darussalam	7	Armenia	-175
Dem. People's Republic of Korea	0	Turkmenistan	-168
Maldives	0	Turkey	-150
Total	14,213	Republic of Korea	-128
PdG	8,681	Iran (Islamic Republic of)	-60
		Mongolia	-30
		Timor-Leste	-10
		Total	-30,583
Source: our elaboration on data PD, 2011			

Table A4 - Thailand - Labour market and demographic sceanarios 2010-35

	WAP		WAP change	Migr 5 year UNPD hypothesis)	WAP change - Migration	rate of participation	Change in LF	Rate of change in employment	Change in employment level	Employment	Total Manpower Needs (5 years)	Total Manpower Needs (yearly average)
		Scenario A										
2005	48942									35257		
2010	52856	2005-2010	3914	490	3424	72.7	2490	7.9	2780	38037	290	58
2015	55379	2010-2015	2,523	395	2,128		1,547	7.9	2,999	41,037	1,452	290
2020	57408	2015-2020	2,030	390	1,640		1,193	7.9	3,236	44,273	2,043	409
2025	58778	2020-2025	1,370	385	985		716	7.9	3,491	47,764	2,775	555
2030	59607	2025-2030	829	385	444		323	7.9	3,766	51,530	3,444	689
2035	59885	2030-2035	278	380	-102		-74	7.9	4,063	55,593	4,138	828
			7,029	1,935	5,094		3,705		17,556		13,851	554
									0.461549178		36.41538221	
	WAP		WAP change	Migr 5 year UNPD hypothesis)	WAP change - Migration Balance	rate of participation	Change in LF	Rate of change in employment over a 5 year period	Change in employment level	Employment	Total Manpower Needs (5 years)	Total Manpower Needs (yearly average)
		Scenario B										
2005	48942									35257		
2010	52856	2005-2010	3914	490	3424	72.7	2490	7.9	2780	38037	290	58
2015	55379	2010-2015	2523	395	2128		1547	7.3	2780	40818	1233	247
2020	57408	2015-2020	2030	390	1640		1193	6.8	2780	43598	1588	318
2025	58778	2020-2025	1370	385	985		716	6.4	2780	46378	2064	413
2030	59607	2025-2030	829	385	444		323	6.0	2780	49158	2457	491
2035	59885	2030-2035	278	380	-102		-74	5.7	2780	51938	2854	571
			7029	1935	5094		3705		13901		10196	408

Table A5 - Thailand; population by main age group and rate of employment in alternative scenarios of migration; 2010-2035													
Scenario A	0-14	15 +			Total population			Percentage of people 0-14			Rate of employment		
		B=1	B=1.15	B=1.30	B=1	B=1.15	B=1.30	B=1	B=1.15	B=1.30	B=1	B=1.15	B=1.30
2010	14,195	52,856	52,856	52,856	67,051	67,051	67,051	21.2	21.2	21.2	72.0	72.0	72.0
2015	13,326	56,436	56,973	57,510	69,762	70,299	70,836	19.1	19.0	18.8	72.7	72.0	71.4
2020	12,359	60,119	61,208	62,298	72,478	73,567	74,657	17.1	16.8	16.6	73.6	72.3	71.1
2025	11,592	63,879	65,532	67,185	75,471	77,124	78,777	15.4	15.0	14.7	74.8	72.9	71.1
2030	11,093	67,766	70,002	72,239	78,859	81,095	83,332	14.1	13.7	13.3	76.0	73.6	71.3
2035	10,831	71,801	74,643	77,485	82,632	85,474	88,316	13.1	12.7	12.3	77.4	74.5	71.7
Diff.	-3,364	18,945	21,787	24,629	15,581	18,423	21,265						
Scenario B													
2010	14,195	52,856	52,856	52,856	67,051	67,051	67,051	21.2	21.2	18.9	72.0	72.0	72.0
2015	13,326	56,216	56,720	57,225	69,542	70,046	70,551	19.2	19.0	18.9	72.6	72.0	71.3
2020	12,359	59,444	60,432	61,420	71,803	72,791	73,779	17.2	17.0	16.8	73.3	72.1	71.0
2025	11,592	62,493	63,938	65,384	74,085	75,530	76,976	15.6	15.3	15.1	74.2	72.5	70.9
2030	11,093	65,394	67,275	69,155	76,487	78,368	80,248	14.5	14.2	13.8	75.2	73.1	71.1
2035	10,831	68,146	70,440	72,733	78,977	81,271	83,564	13.7	13.3	13.0	76.2	73.7	71.4
Diff.	-3,364	15,290	17,584	19,877	11,926	14,220	16,513						

Table A6 - Singapore - Labour market and demographic sceanarios 2010-35

	WAP		WAP change	Migr 5 year UNPD hypothesis)	WAP change - Migration Balance	rate of participation	Change in LF	Rate of change in employment over a 5 year period	Change empl	Employment	Total Manpower Needs (5 years)	Total Manpower Needs (yearly average)
		Scenario A										
2005	3426		353	230	123							
2010	4196	2005-2010	770	720	50	74.7	37.3		781	3047	743.2	
2015	4582	2010-2015	386	175	211		158	22.7	693	3740	535	107
2020	4817	2015-2020	235	125	110		82	22.7	850	4590	768	154
2025	4965	2020-2025	148	125	23		17	22.7	1043	5634	1026	205
2030	5097	2025-2030	132	120	12		9	22.7	1281	6914	1272	254
2035	5197	2030-2035	100	120	-20		-15	22.7	1572	8486	1587	317
			1001	665	336		251		5439		5188	208

	WAP		WAP change	Migr 5 year UNPD hypothesis)	WAP change - Migration	rate of participation	Change in LF	Rate of change in employment over a 5 year	Change empl	Employment	Total Manpower Needs (5	Total Manpower Needs (yearly
		Scenario B										
2005	3426		353	230	123							
2010	4196	2005-2010	770	720	50	74.7	37.3		781	3047	743.2	
2015	4582	2010-2015	386	175	211		158	25.6	781	3828	623	125
2020	4817	2015-2020	235	125	110		82	20.4	781	4608	698	140
2025	4965	2020-2025	148	125	23		17	16.9	781	5389	763	153
2030	5097	2025-2030	132	120	12		9	14.5	781	6169	772	154
2035	5197	2030-2035	100	120	-20		-15	12.7	781	6950	795	159
			1001	665	336		251		3903		3652	146

	WAP		WAP change	Migr 5 year UNPD hypothesis)	WAP change - Migration	rate of participation	Change in LF	Rate of change in employment over a 5 year	Change empl	Employment	Total Manpower Needs (5	Total Manpower Needs (yearly
		Scenario C										
2005	3426		353	230	123							
2010	4196	2005-2010	770	720	50	74.7	37.3		781	3047	743.2	
2015	4582	2010-2015	386	175	211		158	22.7	693	3740	535	107
2020	4817	2015-2020	235	125	110		82	11.4	425	4165	343	69
2025	4965	2020-2025	148	125	23		17	5.7	237	4402	220	44
2030	5097	2025-2030	132	120	12		9	2.8	125	4527	116	23
2035	5197	2030-2035	100	120	-20		-15	1.4	64	4591	79	16
			1001	665	336		251		1544		1293	52

Table A7 - Singapore; population by main age group and rate of employment in alternative scenarios of migration; 2010-2035													
Scenario A	0-14	15 +			Total population			Percentage of people 0-14			Rate of employment		
		B=1	B=1.15	B=1.30	B=1	B=1.15	B=1.30	B=1	B=1.15	B=1.30	B=1	B=1.15	B=1.30
2010	884	4,196	4,196	4,196	5,080	5,080	5,080	17.4	17.4	17.4	72.6	72.6	72.6
2015	783	4,942	5,054	5,166	5,725	5,837	5,949	13.7	13.4	13.2	75.7	74.0	72.4
2020	772	5,820	6,064	6,307	6,592	6,836	7,079	11.7	11.3	10.9	78.9	75.7	72.8
2025	821	6,869	7,270	7,671	7,690	8,091	8,492	10.7	10.1	9.7	82.0	77.5	73.4
2030	866	8,153	8,747	9,340	9,019	9,613	10,206	9.6	9.0	8.5	84.8	79.0	74.0
2035	886	9,720	10,548	11,377	10,606	11,434	12,263	8.4	7.7	7.2	87.3	80.4	74.6
Diff.	2	5,524	6,352	7,181	5,526	6,354	7,183						
Scenario B													
2010	884	4,196	4,196	4,196	5,080	5,080	5,080	17.4	17.4	12.9	72.6	72.6	72.6
2015	783	5,030	5,155	5,280	5,813	5,938	6,063	13.5	13.2	12.9	76.1	74.3	72.5
2020	772	5,838	6,085	6,331	6,610	6,857	7,103	11.7	11.3	10.9	78.9	75.7	72.8
2025	821	6,625	6,989	7,353	7,446	7,810	8,174	11.0	10.5	10.0	81.3	77.1	73.3
2030	866	7,408	7,890	8,372	8,274	8,756	9,238	10.5	9.9	9.4	83.3	78.2	73.7
2035	886	8,184	8,782	9,380	9,070	9,668	10,266	9.8	9.2	8.6	84.9	79.1	74.1
Diff.	2	3,988	4,586	5,184	3,990	4,588	5,186						
Scenario C													
2010	884	4,196	4,196	4,196	5,080	5,080	5,080	17.4	17.4	13.2	72.6	72.6	72.6
2015	783	4,942	5,054	5,166	5,725	5,837	5,949	13.7	13.4	13.2	75.7	74.0	72.4
2020	772	5,395	5,575	5,755	6,167	6,347	6,527	12.5	12.2	11.8	77.2	74.7	72.4
2025	821	5,638	5,854	6,070	6,459	6,675	6,891	12.7	12.3	11.9	78.1	75.2	72.5
2030	866	5,766	6,001	6,237	6,632	6,867	7,103	13.1	12.6	12.2	78.5	75.4	72.6
2035	886	5,825	6,069	6,314	6,711	6,955	7,200	13.2	12.7	12.3	78.8	75.6	72.7
Diff.	2	1,629	1,873	2,118	1,631	1,875	2,120						

Table A8 - Malaysia - Labour market and demographic sceanarios 2010-35

	WAP		WAP change	Migr 5 year UNPD hypothesis)	WAP change - Migration Balance	rate of participation	Change in LF	Rate of change in employment over a 5 year period	Change empl	Employment	Total Manpower Needs (5 years)	Total Manpower Needs (yearly average)
2000	14612	**Scenario A**										
2005	16451		1839	395	1444	63.3	857		776.2	10045	-81	-16
2010	18369	2005-2010	1918	85	1833	62.7	1103.8	10.8	1084	11129	-19.8	-4
2015	20438	2010-2015	2070	85	1985		1244	10.8	1201	12330	-43	-9
2020	22537	2015-2020	2098	85	2013		1262	10.8	1331	13661	68	14
2025	24402	2020-2025	1865	85	1780		1116	10.8	1474	15135	358	72
2030	26200	2025-2030	1798	85	1713		1074	10.8	1633	16768	559	112
2035	27914	2030-2035	1714	85	1629		1022	10.8	1809	18578	788	158
			9545	425	9120		5718		7448		1730	326
									66.9254611			

Malaysia

Scenario contant employmnt growth = value last 5 years

	WAP		WAP change	Migr 5 year UNPD hypothesis)	WAP change - Migration Balance	rate of participation	Change in LF	Rate of change in employment over a 5 year period	Change empl	Employment	Total Manpower Needs (5 years)	Total Manpower Needs (yearly average)
		Scenario B										
2005	16451		1839	395	1444	63.3	857		776	10045	-81	-16
2010	18369	2005-2010	1918	85	1833	62.7	1103.8	10.8	1084	11129	-19.8	-4
2015	20438	2010-2015	2070	85	1985		1244	9.7	1084	12233	-160	-32
2020	22537	2015-2020	2098	85	2013		1262	8.9	1084	13337	-178	-36
2025	24402	2020-2025	1865	85	1780		1116	8.1	1084	14441	-32	-6
2030	26200	2025-2030	1798	85	1713		1074	7.5	1084	15545	10	2
2035	27914	2030-2035	1714	85	1629		1022	7.0	1084	16648	62	12
			9545	425	9120		5718		5420		-399	-80

Table A9 - Malaysia; population by main age group and rate of employment in alternative scenarios of migration; 2010-2035													
Scenario A	0-14	15 +			Total population			Percentage of people 0-14			Rate of employment		
		B=1	B=1.15	B=1.30	B=1	B=1.15	B=1.30	B=1	B=1.15	B=1.30	B=1	B=1.15	B=1.30
2010	8,617	18,369	18,369	18,369	26,986	26,986	26,986	31.9	31.9	31.9	60.6	60.6	60.6
2015	8,671	20,310	20,601	20,892	28,981	29,272	29,563	29.9	29.6	29.3	60.7	59.9	59.0
2020	8,674	22,392	22,995	23,598	31,066	31,669	32,272	27.9	27.4	26.9	61.0	59.4	57.9
2025	8,848	24,530	25,454	26,378	33,378	34,302	35,226	26.5	25.8	25.1	61.7	59.5	57.4
2030	8,971	26,802	28,067	29,332	35,773	37,038	38,303	25.1	24.2	23.4	62.6	59.7	57.2
2035	9,006	29,219	30,847	32,474	38,225	39,853	41,480	23.6	22.6	21.7	63.6	60.2	57.2
Diff.	389	10,850	12,478	14,105	11,239	12,867	14,494						
Scenario B													
2010	8,617	18,369	18,369	18,369	26,986	26,986	26,986	31.9	31.9	31.9	60.6	60.6	60.6
2015	8,671	20,193	20,467	20,740	28,864	29,138	29,411	30.0	29.8	29.5	60.6	59.8	59.0
2020	8,674	22,028	22,577	23,126	30,702	31,251	31,800	28.3	27.8	27.3	60.5	59.1	57.7
2025	8,848	23,776	24,587	25,398	32,624	33,435	34,246	27.1	26.5	25.8	60.7	58.7	56.9
2030	8,971	25,499	26,568	27,638	34,470	35,539	36,609	26.0	25.2	24.5	61.0	58.5	56.2
2035	9,006	27,191	28,514	29,837	36,197	37,520	38,843	24.9	24.0	23.2	61.2	58.4	55.8
Diff.	389	8,822	10,145	11,468	9,211	10,534	11,857						

Table A10 - ASEAN countries; Men and women aged 25-44; educational attainment by sex; 2007											
		Women aged 25-44					Men aged 25-44				
		No education	Primary	Secondary	Tertiary	Mean year of schooling	No education	Primary	Secondary	Tertiary	Mean year of schooling
Cambodia	1970	66	30	3	0	1.7	25	57	18	0	4.5
	2007	20	55	24	1	5	11	47	39	2	6.4
	Diff	*-46*	*25*	*21*	*1*	*3.3*	*-14*	*-10*	*21*	*2*	*1.9*
Indonesia	1970	42	38	20	0	3.9	18	51	29	2	5.6
	2007	2	37	53	8	8.6	1	33	58	8	8.9
	Diff	*-40*	*-1*	*33*	*8*	*4.7*	*-17*	*-18*	*29*	*6*	*3.3*
Laos	1970	75	23	1	0	1.2	36	48	15	2	4
	2007	28	40	24	8	5.4	15	41	31	13	7.1
	Diff	*-47*	*17*	*23*	*8*	*4.2*	*-21*	*-7*	*16*	*11*	*3.1*
Malaysia	1970	39	30	30	1	4.8	19	38	40	2	6.5
	2007	4	11	74	11	10.5	3	12	74	11	10.5
	Diff	*-35*	*-19*	*44*	*10*	*5.7*	*-16*	*-26*	*34*	*9*	*4*
Myanmar	1970	39	44	16	1	3.3	20	53	26	1	4.7
	2007	14	39	38	9	6.6	9	40	44	6	6.9
	Diff	*-25*	*-5*	*22*	*8*	*3.3*	*-11*	*-13*	*18*	*5*	*2.2*
Philippines	1970	7	50	37	7	6.8	6	49	39	6	6.9
	2007	1	19	56	24	10	2	25	54	19	9.3
	Diff	*-6*	*-31*	*19*	*17*	*3.2*	*-4*	*-24*	*15*	*13*	*2.4*
Singapore	1970	47	12	39	2	4.5	30	15	50	5	6.2
	2007	4	6	60	30	10.5	3	6	55	36	10.8
	Diff	*-43*	*-6*	*21*	*28*	*6*	*-27*	*-9*	*5*	*31*	*4.6*
Thailand	1970	23	55	21	1	5.5	15	58	25	2	6.3
	2007	4	42	40	14	9.1	3	41	44	12	9.1
	Diff	*-19*	*-13*	*19*	*13*	*3.6*	*-12*	*-17*	*19*	*10*	*2.8*
Vietnam	1970	24	61	14	0	3.8	8	65	25	2	5.5
	2007	5	56	36	3	6.4	5	54	37	3	6.5
	Diff	*-19*	*-5*	*22*	*3*	*2.6*	*-3*	*-11*	*12*	*1*	*1*
China	1970	39	32	29	1	4.5	15	39	44	2	6.7
	2007	3	23	69	5	8.6	1	16	76	7	9.3
	Diff	*-36*	*-9*	*40*	*4*	*4.1*	*-14*	*-23*	*32*	*5*	*2.6*
Japan	1970		34	60	6	8.9		32	55	13	9.4
	2007		5	50	45	13.1		7	51	42	12.8
	Diff		*-29*	*-10*	*39*	*4.2*	*0*	*-25*	*-4*	*29*	*3.4*
Korea	1970	20	36	42	2	6.3	7	26	59	7	8.7
	2007	0	3	65	32	12.4	0	3	58	39	12.9
	Diff	*-20*	*-33*	*23*	*30*	*6.1*	*-7*	*-23*	*-1*	*32*	*4.2*
Source: International Institute for Applied System Analysis; Asian and Human Capital Data, Data sheet, 2008											

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Executive summary

ASEAN countries have been moving at different speeds along the path of the so called Demographic transition and are at present at different stages of this complex process. As a consequence, starting in the very near future, some ASEAN countries will be affected by an increasing structural lack of labor supply, while in other a structural excess of labor supply will persist for at least 30-40 years. This situation has already contributed to divide ASEAN countries into two groups: departure countries and arrival countries. Data show that both departures and arrivals have been steadily increasing as well as labor mobility within ASEAN.

Building on this demographic background, the paper proposes alternative labor market and demographic scenarios for the period 2010-35. The scenarios outline manpower needs, migration flows and population growth on the basis of the trends in WAP and alternative hypothesis on employment growth. The main conclusion is that the higher the rate of economic growth that will be attained by Singapore, Thailand, Malaysia, and Brunei (already relevant arrival countries), the higher their need of foreign labor. In fact, in a very near future the local labor supply of these countries will not be even sufficient to replace the workers that will leave for good the labor force due to retirement or death. In substance, the paper supports the idea that growing workers mobility within ASEAN countries will represent an unavoidable precondition for economic growth and social development.

A survey of economic growth model brings us to support the idea that economic growth is the result of a process of technological upgrading, of diversification and structural change driven by the accumulation of capabilities, on one hand, and the transformation of the production structure, on the other. It is the knowledge base of a country that defines and limits the technologies a country can adopt, the production structure that may evolve, and therefore the possible paths to economic growth and social development. Speeding up economic growth and triggering successful catching up processes does require shifting production from low quality activities into "high quality activities", to "jump" into new knowledge clusters. In order to do so a country also needs to drive the knowledge structure toward higher diversity and complexity, to endow its incoming labor force with new expertise and competences.

The different levels of economic development reached by ASEAN countries have been fostered and reflect their different knowledge base. The percentage of people between 15-44 with secondary and tertiary education spans between the maximum of Singapore (91 per cent) and the minimum values that characterize Laos, Cambodia, and Vietnam (between 40 and 45 per cent). A more detailed analysis of the national educational attainments shows that beside Singapore -that has the world highest ranking in Industrial performance- only Malaysia and Indonesia have already shifted their production structure to high quality activities and new knowledge cluster or are ready to do so. The more polarized education structure of Thailand and possibly Myanmar suggest that these two countries have limited options to

start the production of intermediate technology products, but could develop directly toward high technology sectors.

In conclusion, the paper contends that in a very near future workers mobility within the ASEAN region will not be a choice, but a necessity imposed by demographic tendencies and economic growth. The pace of economic growth and the typology of development will determine the amount of labor force that will be needed and the competencies and skills that will be required by arrival countries. At the same time, the other ASEAN countries will be characterized by a structural excess of labor supply that will not be able to find a productive occupation in the national markets, since the rate of economic growth requested to absorb it will remain out of reach.

It could be ASEAN goal to transform these weaknesses into strong points.

The structural lack of labor supply that will affect Singapore, Thailand and, although in a lesser measure, Malaysia can be faced only in two ways: migration and delocalization of production. The second approach, although viable from an economic perspective, can provide only a very partial solution to the expansion of production, given its risks and serious political drawbacks.

In this situation the papers proposes a series of policy options.

In the first place, a correct migration policy can be based only upon a serious evaluation of the amount and typology of workers needed by arrival countries. The paper stresses the fact that the more developed economies do not need only skilled labor, but on the contrary -especially at the beginning of the migration process- they need mainly unskilled labor and only with time qualified workers and university graduates will become predominant.

The other side of the coin is that the outflow of migrants presents both positive and negative aspects for departure countries. On one hand, it reduces the pressure on the labor market and provides remittances that could support productive investments. On the other hand, it depletes the knowledge structure and the capabilities of the departure countries because migrants are always, by definition, the most dynamic element of their societies.

A correct approach to economic growth and catching up suggests that educational policies and industrial policies can play a fundamental role. In order to do so educational policies must be designed and implemented in relations to the training needs of both departures and arrival countries, while industrial policies should provide a production structure capable of promoting economic growth and a labor demand coherent with the exits from the educational system.

More specifically, at national level, education and training policies should: 1) in the short run, provide a correct response to the local labor demand in terms of skills; 2) in the long run, endow the incoming generations with the knowledge and the skills necessary to move the national production structure toward higher quality products. Moreover, the

educational policies of the departures countries should be coordinated also with the industrial policies of the arrival countries so that the structural excess of labor supply of departures countries will find productive employment or in the arrival countries or in their investment in departures countries.

In order to face such complex set of task, ASEAN countries will need, as already clearly suggested by the last ALM Working Program, a Labor Market Information System providing comparable information on the main aspects of human resources management, from demography to education and vocational training, from macroeconomic to employment, unemployment and migration, together with a broad comparative view of their labor market legislation.

Therefore, an extremely important objective of ASEAN could be the constitution of an **ASEAN Labor Market Information System** aimed to collects, store and analyze the data produced at the national level, better their quality, and promote their comparability.

The paper proposes a second important measure that responds not only to principles of equity and competitiveness but could also foster economic growth and social development: the creation of an **Employment Migration Fund**.

A migrant brings with him a set of capabilities that are the result not only of its personal investment, but also of the investment in education made by its country of origin. In substance, the arrival of a migrant corresponds for the production system of the receiving country to the free acquisition of a factor of production. This is obviously true only if and when the migrant worker is needed, i.e. his services are essential and do not have a substitute in the arrival country. The paper has strongly argued that this situation will exist and persist for at last four ASEAN countries and will affect a number of workers largely in excess of those "forecasted" by international Institutions.

This aspect of migration has been largely overlooked by the literature because migrations are still predominantly explained from the supply side, migrants being represented as people running away from misery and deprivation or just looking for higher wages and a better life. This perspective has brought to the proposal, almost 40 years ago, of the so-called Bhagwati tax.

If we abandon this point of view and more in tune with reality and empirical evidence we realize that many developed economies that have been affected already for long time by below replacement fertility do not have enough internally "produced" labor not only to expand, but even to keep the present level of production, then we have also to change our image of the migrants.

The first obvious implication is that the arrival country should pay to the departure country for each migrant employed in a productive job a price proportional to the cost supported by the government of the country of origin for its education and training.

The proposal is that these contributions be collected in an **Education Migration Fund** managed by ASEAN to be used only to improve the

education and training system of member countries by intervening on the infrastructures, training the teachers, providing equal opportunities, and promoting gender equality, in coordination with the industrial and macroeconomic policies required to start effective catching up processes.

This measure would not only respond to a principle of equity, eliminate market distortions deriving from the free acquisition of factors of production by arrival countries, but in the growth perspective we have introduced, it would also be beneficial to arrival countries by fostering the process of catching up of the weaker economies, increasing their level of income and therefore expanding the market for the products coming from the more developed neighbors.

JEL Classification: F22, I25, J11, J24, 053

Keywords: ASEAN; Labor market; Demography; Scenarios; Migration; Education; Growth

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We shall work closely with workers, employers, civil society, and other organizations to provide a favorable environment for economic growth and employment creation, as a key strategy to accelerate economic recovery and growth.

We shall give priority to capacity-building in order to develop a productive, competent, and competitive workforce. This will enable the people of ASEAN to meet the changing job demands and challenges in the face of the integration of regional and global labor markets.

ASEAN Labor Ministers' Vision Statement, 2000

1 INTRODUCTION [1]

1.1 The Institutional background

ASEAN countries are committed to "enhance and improve the capacity of ASEAN human resources through strategic programs, and to develop a qualified competent and well-prepared ASEAN labor force that would benefit from as well as cope with the challenges of regional integration"[2].

Since 2000, ASEAN's activities on labor and human resources have been guided by ASEAN Labor Ministers (ALM) Work Programs. The first Work Program set five broad priorities in the areas of employment generation, labor market monitoring, labor mobility, social protection, and tripartite cooperation. In the ALM Joint Statement of 2006 a sixth priority area, namely occupational safety and health (OSH), was added to in the Work Program. Since then new areas of work have emerged, including protection and promotion of the rights of migrant workers, HIV prevention and control in the work place, employment and labor law, as expressed in the ASEAN community blueprints.

A *Ad-hoc Working Group on Progressive Labor Practices to Enhance the Competitiveness of ASEAN* was established in 2006. In 2009, the ASEAN leaders adopted the Cha Am Hua Hin Declaration on Strengthening Cooperation on Education to Achieve a Caring and Sharing Community. The 17th ASEAN summit, held in Hanoi in 2010, focused on skills development and life-long learning. In that occasion the Leaders of ASEAN adopted a *Joint Statement on Human resources and Skills Development for Economic Recovery and Growth*.

The Joint Statement affirmed that: "HR development should be an integral part of a country's development strategy", the rational being that "Human resources development correlates with productivity and higher productivity leads to higher economic growth." It suggested that in the

[1] The paper has been written in the context of the project STVET (Strengthening Technical Vocational Education and Training) of the Ministry of Labor and Vocational Training (MOLVT) financed by the Asian Development Bank (ADB Grant Number: 0178-CAM) in which the author acted as Labor Market Information and Statistic Specialist. The views and opinions expressed in the paper are strictly those of the author.

[2] ASEAN Socio-Cultural Community Blueprint.

medium-and long-term regional countries should take measures, among others, to upgrade the quality of the workforce through improving the relevance and quality of education and training. It further suggested that the gradual shift from an export-oriented economy to a more internal consumption base economy that many ASEAN countries will experience will need a greater capacity to rapidly intervene in the development of HR. Finally it reminded that the social dialogue between employers and employees should be strengthened to better the matching between the skill needed by the employers and the training provided to the workers. The document concluded stating that the " ... globalization, technological development and demographic change have added a sense of urgency to improving quality of HR as they change the workplace, the nature and organization of work."

According to the last ALM Work Program covering the period 2010-2015: " The overall objective of ASEAN cooperation on labor is to build towards the vision of a better quality of life, productive employment, and adequate social protection for ASEAN peoples through enhancing workforce competitiveness, creating a harmonious and progressive workplace, and promotion of decent work for all." The work plan indicates four strategic priorities: i) Legal foundation; ii) Institutional capacity; iii) Social partners; iv) Labor market and workforce development.

The first priority implies the protection of labor right and conditions, including those of migrant workers; the second the capacity of the Government bodies to oversee the enforcement of labor laws and regulation; the third the establishment of informed social dialogue among labor sector partners at the national and regional level. The fourth priority includes a set of goals that will be at the center of the present paper:

1. Creating systems that will promote the mobility of skilled labor within ASEAN;
2. Anticipating, analyzing, monitoring and communicating to labor sector stakeholders and the public the impact of trade liberalization and of other global economic challenges on employment, wages, working condition, skills demand, etc.;
3. Promoting progressive labor practices with regard to workforce development, skills training and standards, labor productivity, and labor law in order to enhance the competitiveness of firms and workforces, and thus of the ASEAN Member States and the region overall;
4. Generating, regularly updating, and effectively disseminating labor market information.

1.2 The structure of the paper

The paper is structured in four parts. The first part analyses the impact of the Demographic transition (that we will prefer to call Demographic revolution) on the demographic tendencies and indicators of ASEAN countries. It will document the fact that the members of ASEAN have proceeded at different speeds along the path of the Demographic revolution

and have reached different stages of this complex process. As a consequence, while some countries are already (or will be soon) characterized by a declining Working Age Population (WAP), in other WAP will continue to grow. This will create a structural lack of labor supply in some countries and an excess of labor supply in the others.

In the second part of the paper a model is introduced that allows estimating manpower needs, migration flows, and population trends as a function of the evolution in WAP and alternative hypothesis on employment growth. The model is used to build alternative labor market and demographic scenarios for ASEAN arrival countries. The exercise clearly shows that the future economic growth of Singapore, Thailand, and Malaysia will hinge on the arrival of very relevant numbers of foreign workers. The results are discussed on the basis of the tendencies exhibited in previous periods by migration flows in the Asian continent and more specifically in ASEAN countries and of a critical appraisal of the projections made by the United Nations Population Division.

The third part of the paper discusses alternative growth theories and their implications in terms of industrial and educational policies. It will be shown that according to the New evolutionary economics, growth is lead by the accumulation of capabilities that allows, in a first phase, to diversify production inside a given knowledge cluster, and then to jump to new knowledge clusters, i.e. to move to higher quality products.

The fourth part of the paper reviews the educational attainments of ASEAN countries. It then discusses the relationship between their education structure and the stage of growth they have reached and outlines their present options for technology and product diversification.

The conclusion will bring together the main results reached in the four parts of the paper and spell out a series of policy suggestions.

2 THE DEMOGRAPHIC BACKGROUND

In 1950 the total population of ASEAN countries amounted to around 172 million; after 60 years it reached almost 593 million and by now it should have passed the 600 million mark[3]. The average growth of 7 million per year registered in this long time interval is the result of 11 million births, 4 million deaths, and of around 150,000 net migrants per year (Table 1).

[3] Percentage rates of growth above the regional average (243.7 per cent) have been registered by the four smallest countries (Brunei, Singapore, Laos and Malaysia), together with Philippines, that register an astonishing demographic growth of 407%. As a consequence, Philippines are now the second most populous country in ASEAN after Indonesia that remains the most populous one with 240 million inhabitants, but ahead of Vietnam and Thailand.

Table 1 - ASEAN countries; population, births, deaths and migration balance; absolute values; 1950 - 2010

	Population 1950	Birth	Death	Natural Balance	Migration balance	Total balance	Population 2010
Brunei	47	345	35	310	496	806	853
Cambodia	4,346	18,650	8,055	10,595	-803	9,792	14,138
Indonesia	74,838	271,095	101,475	169,620	-4,590	165,030	239,868
Laos	1,683	7,910	2,850	5,060	-540	4,520	6,203
Malaysia	6,112	26,105	5,670	20,435	1,855	22,290	28,402
Myanmar	17,156	58,600	25,970	32,630	-1,810	30,820	47,976
Philippines	18,395	102,395	22,400	79,995	-5,135	74,860	93,255
Singapore	1,025	3,010	815	2,195	1,865	4,060	5,085
Thailand	20,608	67,210	21,340	45,870	2,615	48,485	69,093
Vietnam	28,263	101,205	38,440	62,765	-3,170	59,595	87,858
Total	172,473	656,525	227,050	429,475	-9,218	420,258	592,731
Yearly average		10,942	3,784	7,158	-154	7,004	
Source - United Nations, 2011a							

Rather surprisingly, these long-run yearly average values are almost identical to those of the 2005-2010 period, the only notable difference being represented by the average number of net migrants that has soared to almost half a million (Table 2).

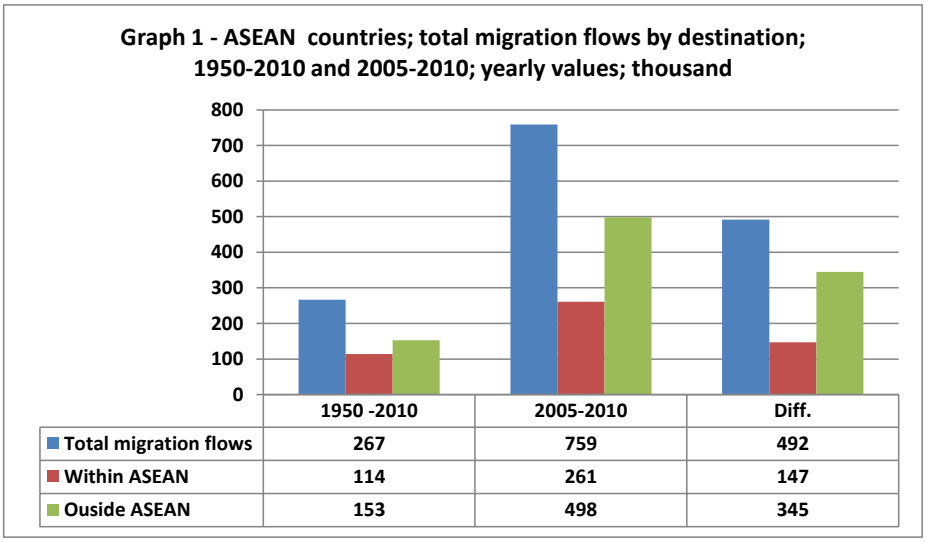
Table 2 - ASEAN countries; population, births deaths and migration balance; absolute values; 2005-2010

	Population 2005	Birth	Death	Natural Balance	Migration balance	Total balance	Population 2010
Brunei	809	40	5	35	9	44	853
Cambodia	13,358	1,605	565	1,040	-260	780	14,138
Indonesia	227,303	22,320	8,460	13,860	-1,295	12,565	239,868
Laos	5,753	720	195	525	-75	450	6,203
Malaysia	26,097	2,855	635	2,220	85	2,305	28,402
Myanmar	46,331	4,230	2,085	2,145	-500	1,645	47,976
Philippines	85,540	11,590	2,640	8,950	-1,235	7,715	93,255
Singapore	4,270	205	110	95	720	815	5,085
Thailand	66,668	4,365	2,430	1,935	490	2,425	69,093
Vietnam	83,168	7,360	2,240	5,120	-430	4,690	87,858
Total	559,297	55,290	19,365	35,925	-2,491	33,434	592,731
Yearly average		11,058	3,873	7,185	-498	6,687	
Source - United Nations, 2011a							

Between 1950 and 2010 the largest migration flows were originated by Philippines (more than 5 million), followed by Indonesia (4.6 million), Vietnam (3.2 million), Myanmar (1.8 million), Cambodia (0.8 million) and Laos (0.5 million). Positive migration balances were registered by Thailand (2.6 million), Malaysia and Singapore, with 1.8 million each, and Brunei with 0.5 million[4]. Therefore, in 60 years six ASEAN countries have generated a little more than 16 million migrants (267,000 per year); of these 6.8 million (42.6 per cent) have

[4] The realism of these values will be discussed in a later paragraph.

moved to other ASEAN countries[5]), while 9.2 million have left the ASEAN region (57.4 per cent).



	1950 -2010	2005-2010	Diff.
Total migration flows	267	759	492
Within ASEAN	114	261	147
Ouside ASEAN	153	498	345

Source - Author elaboration on United Nations data, United Nations, 2011a

In the last 5 years, the yearly average number of migrants has grown to 759,000, 261,000 of which headed toward some ASEAN countries, while the other 498,000 left the region (Graph.1). The departure countries have remained the same, but out-migration is now very concentrated, with Indonesia and Philippines accounting respectively for 34.1% and 32.5% of the total. At the same time two countries, Singapore and Thailand, accounted for 92.8 per cent of the total positive migration balance. It must also be underlined that the percentage of migrants that have moved within ASEAN has diminished from 42.7 per cent over the total period to 34.4 per cent in the last 5-year period.

The demographic boom registered by all ASEAN countries has been the result of the so-called "demographic transition" that is also going to have a very strong impact on their demographic future. The demographic transition has been defined as the passage from a traditional demographic regime, characterized by high fertility and high mortality, to a modern demographic regime, characterized by low fertility and low mortality. The drop in fertility below replacement level that by now has already taken place in around 50 developed and developing countries puts in serious doubt that what we are witnessing is a transition, i.e. the passage from an equilibrium regime to another equilibrium regime. Therefore, from now on we will use the terminology demographic revolution that is much more suggestive of the creative demographic disorder that is presently affecting the world.

In 1950-55, in all ASEAN countries, the Total Fertility Rate (TFR) – that we can loosely define as the total number of children per woman- was well above world average (4.95) (Table 3). Only two countries, Laos and Indonesia, registered a TFR below 6, while in the Philippines the TFR was

[5] In this context, it should be underlined that 62% of the extraordinary demographic growth of Brunei is due to immigration.

above 7 and in Brunei exactly 7. In the other six countries the TFR ranged from 6.61, registered by Singapore, and 6 registered by Myanmar. After 60 years only Philippines and Laos register TFR above 3 and four countries (Myannar, Vietnam, Thailand and Singapore) are already below replacement level[6], while Indonesia and Brunei could reach this historical borderline during the present decade. In all these countries the TFR has dimished by more than 60%, with record values registered by Singapore (-81.1%) and Thailand (-73.5%).

Table 3 - ASEAN countries; total fertility rate; 1950-55 and 2005-10

	1950-55	2005-10	Abs. change	% change
Philippines	7.42	3.27	4.15	55.9
Laos	5.94	3.02	2.92	49.2
Cambodia	6.29	2.80	3.49	55.5
Malaysia	6.23	2.72	3.51	56.3
Indonesia	5.49	2.19	3.30	60.1
Brunei	7.00	2.11	4.89	69.9
Myanmar	6.00	2.08	3.92	65.3
Vietnam	6.20	1.89	4.31	69.5
Thailand	6.14	1.63	4.51	73.5
Singapore	6.61	1.25	5.36	81.1
Source - United Nations, 2011a				

A declining trend has characterized also mortality. Life expectancy has increased in all ASEAN countries, the most spectacular results having being achieved by Vietnam and Indonesia whose life expectancy at birth has increased respectively by 6.8 and 5.8 months per year. The spread between the maximum value (80.6, Singapore) and the minimum value (61.5, Cambodia) remains, however, very large[7] (Table 4).

Table 4 - ASEAN countries; life expectancy at birth; 1950 and 2010; years

	1950	2010	Absolute change (years)	Average yearly increase (months)
Cambodia	39.4	61.5	22.1	4.4
Myanmar	36.0	63.5	27.5	5.5
Laos	42.4	66.1	23.7	4.7
Philippines	55.4	67.8	12.4	2.5
Indonesia	38.8	67.9	29.1	5.8
Malaysia	55.4	73.4	18.0	3.6
Thailand	50.7	73.6	22.9	4.6
Vietnam	40.4	74.3	33.9	6.8
Brunei	57.7	77.5	19.8	4.0
Singapore	60.2	80.6	20.4	4.1
Max - Min	-18.3	-19.1	0.8	0.2
Source - United Nations, 2011a				

[6] The replacement level is the level at which total population remains constant and is approximately 2.1children per woman

[7] The main determinant of this large difference is represented by infant mortality.

These data do clearly show that ASEAN countries have been moving along the path of the demographic revolution at different speed, due to the political, economic and social events that have characterized their history in the second half of the XX century and in the beginning of the XXI century. The different position of each ASEAN country along the path of the demographic revolution can be captured and further documented with the help of other demographic indicators such as the Infant mortality rate and the structure of population by main age group.

The Infant mortality rate (IMR) plays a very important role in determining the level and the trend of life expectancy at birth (Table 5). In 1950, the Infant mortality rate (the number of children that die before reaching one year of age per thousand) presented a wide range of values that were reflected by life expectancy data. The most dramatic situation was that of Myanmar, where more than one child out of 5 died before age one; Singapore presented the best situation, but also in Singapore 1 child out of 16 died before age one.

Table 5 -ASEAN countries; Infant mortality rate; 1950 and 2010

	2010	1950	Dff.
Singapore	1.9	60.7	-58.8
Brunei	4.8	90.2	-85.4
Malaysia	7.7	96.4	-88.7
Thailand	12.4	130.3	-117.9
Vietnam	20.4	157.9	-137.5
Philippines	23.0	96.8	-73.8
Indonesia	28.8	191.9	-163.1
Laos	44.5	167.1	-122.6
Myannar	55.0	212.8	-157.8
Cambodia	62.4	165.1	-102.7
Max-Min	60.5	152.1	-91.6

Source - United Nations, 2011a

In the following 60 years, all ASEAN countries have made substantial improvements so that the worst-case scenario registered in 2010 is similar to the best-case scenario in 1950. Infant mortality has been completely eradicated in Singapore, and values of the IMR below 10 per thousand are registered in Brunei and Malaysia, with Thailand at 12.4. Vietnam, Philippines and Indonesia present values between 20 and 30, Vietnam and Indonesia being between the countries that have accomplished the biggest improvements, and Philippines the one with the worst performance. Laos, Myanmar, and Cambodia occupy the last three positions in the ranking.

In a first phase, the demographic revolution generates waves of births of increasing magnitude and then waves of declining magnitude. The passage of time makes each cohort move orderly along the path of life,

determining first a huge expansion of the proportion of children and then an increasing proportion of people in working age.

The different stage reached by each ASEAN countries along the path of the demographic revolution is therefore illustrated also by the percentage of young people and of WAP (Table 6). The percentage of the former is included between a minimum of 17.4 per cent in Singapore and a maximum of 35.5 per cent in the Philippines, with other three countries registering values above 30 per cent: Laos, Cambodia, and Malaysia. At the same time Singapore presents the highest percentage of WAP (73.6 per cent), and other three countries (Thailand, Vietnam, and Brunei) are characterized by values above 70 per cent. At the opposite end of the ranking we find as expected the Philippines, where WAP weights only 60.9 per cent, preceded by Laos, Cambodia, and Malaysia

Table 6 - ASEAN countries; total population; percentage composition by main age group; 2010

	0-14	15-64	65+	80+
Singapore	17.4	73.6	9.0	1.8
Thailand	20.5	70.6	8.9	1.7
Vietnam	23.6	70.4	6.0	1.2
Brunei	26.2	70.2	3.6	0.7
Myanmar	25.8	69.2	5.0	0.8
Indonesia	27.0	67.4	5.6	0.7
Malaysia	30.3	64.9	4.8	0.6
Cambodia	31.9	64.3	3.8	0.4
Laos	34.5	61.6	3.9	0.5
Philippines	35.5	60.9	3.6	0.4
Max - Min	18.1	12.7	5.4	1.4

Source - author elaboration on United Nations data, United Nation. 2011a

3 THE EVOLUTION OF WORKING AGE POPULATION

3.1 ASEAN

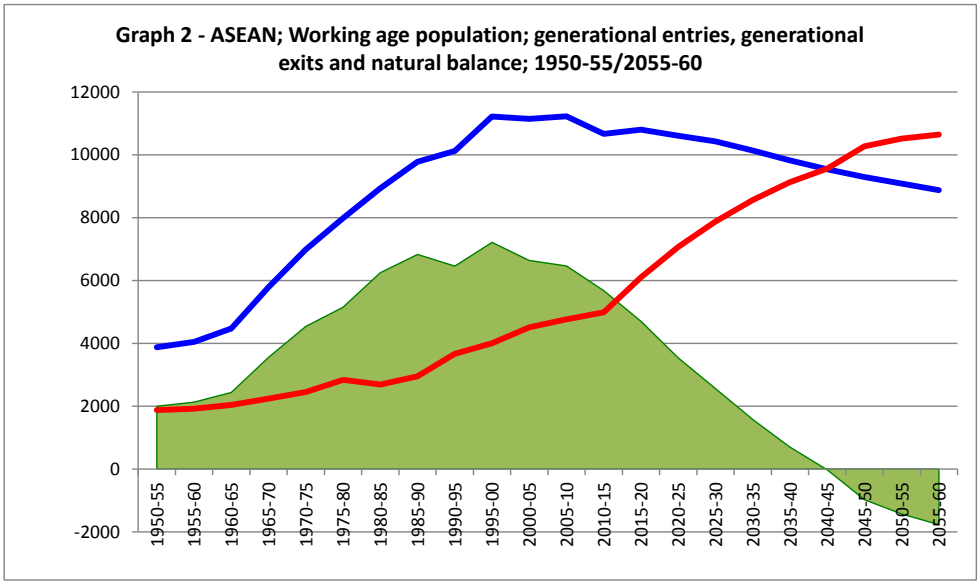
Given the scope of this paper, we will now concentrate our attention on the effects of the Demographic revolution on WAP that is the source of labor supply, a first necessary step to analyze labor mobility and the role of education and vocational training.

As we have already seen, from this perspective, one of the first impacts of the Demographic revolution is that of provoking an extremely relevant increase in WAP[8], a phenomenon that has initially characterized the

[8] The first manifestation of the demographic transition is the reduction of the infant mortality rate that will then be translated into an increase in the size of the cohorts entering reproductive age, while the TFR is still at the traditional level. This will, in its turn, provoke a progressive increase in the number of yearly births, a trend that will continue also when the fertility rate will start to drop, due to the increasing dimension of the cohorts in reproductive age. This is the chain of events that has

developed countries -the firsts to enter the demographic revolution in the XVIII and XIX century- then the developing countries from the middle of the XIX century, and is now starting to affect the least developed countries.

Graph 2 shows the impact of the demographic revolution on the total WAP of ASEAN. Initially, the expansion in WAP has been driven by an extraordinary increase in generational entries[9] that grew from an average yearly value of around 4 million in the fifties to record values of above 11 million between 1995 and 2010. Generational exits have started to register relevant increases only at the beginning of the '90s when bigger cohorts have reached "retirement age". As a consequence of these events as well of the migration flows we have previously documented, the WAP of ASEAN has increased from 100 million in 1950 to 398 million in 2010. We can, therefore, safely assume that at present the ASEAN WAP is above 400 million.



Source - Author elaboration on United Nations data, United Nations, 2011a

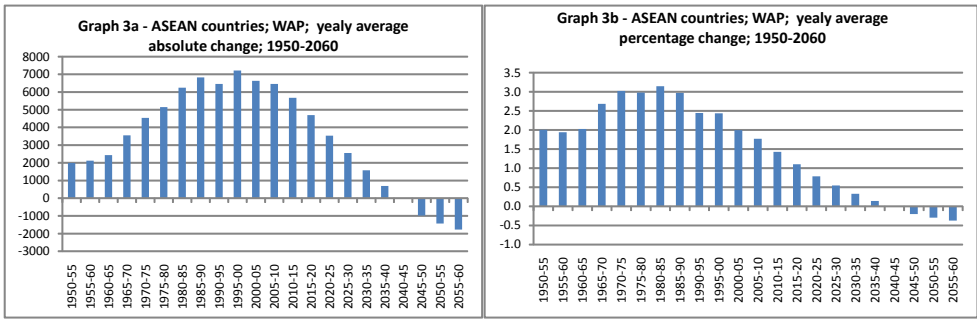
At the beginning of the new century ASEAN WAP starts to exhibit the second effect of the demographic revolution: a progressive, but rather fast slowdown in its rate of growth, due mainly to the increase in generational exits, but also to the smaller number of young people reaching working age. According to the U.N. Population Division, in about 30 year, generational exits from WAP will begin to exceed generational entries and WAP will start to decline. On the basis of the hypotheses adopted by the Population Division for the Medium variant scenario, inclusive of the assumptions on migration that we will discuss in a later paragraph, ASEAN

determined the explosion of WAP in developed countries in the second half of the XIX century and at the beginning of the XX.

[9] Generational entries are equal to the number of people who become 15 in the time interval considered, while generational exits are equal to the number of people who become 65 in the same period plus the people who died.

WAP is expected to peak at 491 million in 2040, to then decline to 470 million in 2060[10].

Graphs 3a and 3b present the evolution of the yearly average absolute change and of the yearly average rate of growth of WAP registered between 1950 and 2010 and the values forecasted for the following 50 years.



Source - Author elaboration on United Nations data, United Nations, 2011a

The absolute growth of ASEAN WAP did reach a maximum value of 7.2 million in the 1995-2000 interval, and is now down to around 6 million; it is expected to decline to 3.5 million at the beginning of the 2020s, to 1.5 million at the beginning of the 2030s, and to become negative in the 2040s. The percentage rate of growth did peak earlier, in the 1980-85 period, at 3.1 per cent. It is now down to 1.4 per cent, and is expected to decline by around 60 per cent every ten years.

These data show that the pressure to create additional jobs in order to accommodate the incoming generations is already declining and it will continue to do so in the foreseeable future. This trend will, on one hand, facilitate the ongoing process of modernization, i.e. the substitution of employment in the agricultural sector with employment in the modern sectors, but on the other will make unavoidable a marked increase in the exchange of Labor force within ASEAN.

3.2 The country level

As we have already discussed, the ten countries that constitute ASEAN have been moving along the path of the demographic revolution at different speed and, therefore, they are presently located in different stages of this process. As we will discuss in the following paragraphs, this has very important implications with respect to internal and external mobility.

WAP, net of migrations, is forecasted to continue to grow until 2060 in only two of the ten ASEAN countries, Malaysia and Philippines. In all the other eight, an historical maximum will be reached at or before 2050. The first country whose WAP would peak in absence of migration is Singapore, in 2015; Thailand will follow in 2020; Myanmar, Vietnam and Indonesia in 2035; Brunei in 2040; Cambodia in 2045; Laos in 2050 (Table 7).

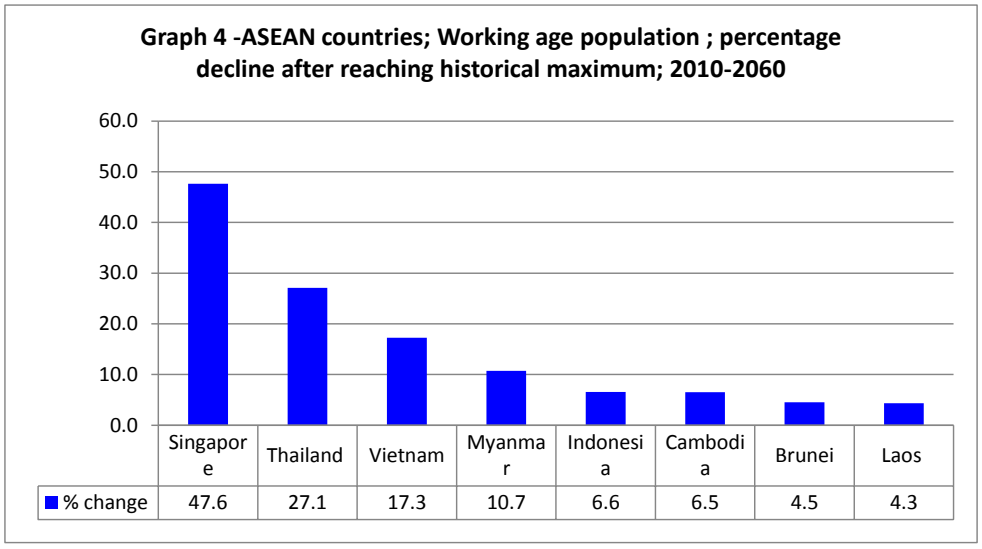
[10] See United Nations, 2011a

Table 7 -ASEAN countries; Working age population; absolute values; 1950 -2060

	Singapore	Thailand	Myanmar	Vietnam	Indonesia	Brunei	Cambodia	Laos	Malaysia	Philippines	ASEAN
1950	585	11,257	10,704	18,063	42,561	29	2,395	966	3,305	9,717	99,582
1960	897	14,770	11,709	19,520	51,944	43	2,980	1,174	4,167	12,985	120,189
1970	1,202	19,395	14,241	22,891	63,349	68	3,746	1,481	5,666	18,085	150,124
1980	1,647	27,045	18,301	29,361	83,461	112	3,778	1,699	7,946	25,188	198,538
1990	2,200	37,259	23,418	38,242	110,202	157	5,086	2,209	10,796	34,334	263,903
2000	2,791	43,654	28,970	49,079	137,966	218	6,893	2,873	14,715	45,079	332,238
2005	3,068	46,417	31,053	55,554	150,282	247	8,058	3,287	16,572	50,877	365,415
2010	3,742	48,786	33,206	61,842	161,699	282	9,090	3,821	18,432	56,819	397,719
2015	3,783	49,935	35,428	65,930	173,599	302	10,083	4,389	20,191	64,315	427,955
2020	3,669	50,071	36,773	68,438	184,564	320	10,892	4,872	21,799	71,721	453,119
2025	3,421	49,211	37,799	70,570	192,514	335	11,641	5,296	23,044	78,505	472,336
2030	3,176	47,794	38,519	71,714	197,661	345	12,308	5,669	24,117	85,162	486,465
2035	2,898	45,855	38,792	71,924	199,921	353	12,884	6,004	25,203	91,690	495,524
2040	2,705	43,870	38,484	70,955	199,899	355	13,339	6,272	26,191	97,971	500,041
2045	2,529	41,918	37,950	69,193	198,032	352	13,775	6,440	27,031	103,607	500,827
2050	2,356	39,966	37,063	66,263	194,648	351	13,500	6,493	27,623	108,480	496,743
2055	2,201	38,084	35,827	62,866	190,939	345	13,275	6,408	28,010	112,377	490,332
2060	1,981	36,171	34,632	59,515	186,766	339	12,876	6,212	28,207	115,439	482,138
1950-2010	3,157	37,529	22,502	43,779	119,138	253	6,695	2,855	15,127	47,102	298,137
2010 -2060	-1,761	-12,615	1,426	-2,327	25,067	57	3,786	2,391	9,775	58,620	84,419
Max - 2010	41	1,285	5,586	10,082	38,222	73	4,685	2,672	9,775	58,620	103,108
2060-Max	-1,802	-13,900	-4,160	-12,409	-13,155	-16	-899	-281	9,775	58,620	-18,689

Source - Author elaboration on United Nations data, United Nations, 2011a

As a consequence, in absence of migration, these eight countries will register very substantial declines in WAP although over different time intervals, the duration of the interval obviously playing a central role in determining the amount of the decline. Singapore, the most advanced country along the demographic revolution and the first to register the historical peak of WAP, is forecasted to lose almost 50 per cent of its WAP, Thailand 27.1 per cent, Vietnam 17.3 per cent, Myanmar 10.7 per cent and the other countries percentages between 4 and 7 per cent (Graph 4) All together the WAP of these countries is expected to decline by around 45 million.



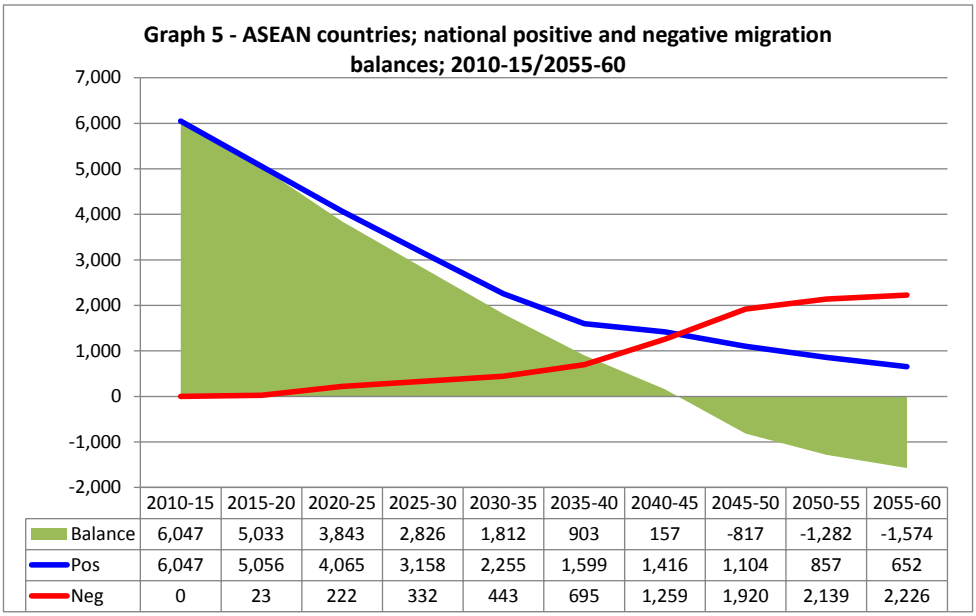
Source - Author elaboration on United Nations data, United Nations, 2011a

The most suggestive aspect is, however, that from 2015 ASEAN will start to include an increasing number of countries that will be characterized by a declining WAP and others where WAP will still be growing, but at a diminishing pace.

Table 8 - ASEAN countries; Working age population; absolute yearly change; 2010-2060; thousand

	Singapore	Thailand	Myanmar	Vietnam	Indonesia	Brunei	Cambodia	Laos	Malaysia	Philippines	ASEAN
	Absolute yearly change										
2010-2015	8	230	444	818	2,380	4	199	114	352	1,499	6,047
2015-2020	-23	27	269	502	2,193	4	162	97	322	1,481	5,033
2020-2025	-50	-172	205	426	1,590	3	150	85	249	1,357	3,843
2025-2030	-49	-283	144	229	1,029	2	133	75	215	1,331	2,826
2030-2035	-56	-388	55	42	452	2	115	67	217	1,306	1,812
2035-2040	-39	-397	-62	-194	-4	0	91	54	198	1,256	903
2040-2045	-35	-390	-107	-352	-373	-1	87	34	168	1,127	157
2045-2050	-35	-390	-177	-586	-677	0	-55	11	118	975	-817
2050-2055	-31	-376	-247	-679	-742	-1	-45	-17	77	779	-1,282
2055-2060	-44	-318	-239	-670	-835	-1	-80	-39	39	612	-1,574

Source - Author elaboration on Population Division data, United Nations, 2011a



	2010-15	2015-20	2020-25	2025-30	2030-35	2035-40	2040-45	2045-50	2050-55	2055-60
Balance	6,047	5,033	3,843	2,826	1,812	903	157	-817	-1,282	-1,574
Pos	6,047	5,056	4,065	3,158	2,255	1,599	1,416	1,104	857	652
Neg	0	23	222	332	443	695	1,259	1,920	2,139	2,226

Source - Author elaboration on United Nations data, United Nations, 2011a

Graph 5 shows how the progressive reduction in ASEAN WAP growth and its becoming negative starting in 2040 will be brought about by the fact that an increasing number of countries will register a negative trend in their WAP.

4 THE CAUSES OF ECONOMIC MIGRATIONS

International migration flows are largely explained by the co-presence of countries characterized by a structural lack of labor supply and countries characterized by a structural excess of labor supply[11], the thesis being that migrations are demand driven, but take place only when excess supply is present in other countries[12].

[11] For a detailed presentation of the model and an application to a series of countries and areas with below replacement fertility see M. Bruni, 2009; for an application to China see M. Bruni 2013 and 2011, and M. Bruni and C. Tabacchi, 2011.

[12] According to this perspective the Migration Balance of arrival countries are determined by their Total Manpower Needs. As a consequence the world total migration flows are largely determined by the need of labor in arrival countries.

We will say that a country is characterized by a structural lack of labor supply, when a relevant share of the available jobs cannot be covered by the local labor supply. Analogously, we will say that a country is characterized by a structural excess of labor supply when a relevant and growing share of its labor supply cannot find employment. The countries characterized by a structural lack of labor supply are potential countries of arrival, while the countries characterized by a structural excess of labor supply are potential countries of departure.

Let's define Total Manpower Needs as the difference between the increase in labor supply and the increase in labor demand, over a given time interval. Taking an operational perspective, the change in labor supply can be identified with the change in the level of the local Labor force (ΔLF) registered or forecasted over a given interval (t, t+1). The increase in labor demand can be identified with the change in the level of employment (ΔE) registered or forecasted over a given interval (t, t+1).

The absolute change in the Labor force is the results of two components, one of demographic origin, the second connected to the propensity of the people in working age to participate in labor market activities. The former is identified in the change of the level of the Labor force due to the change in the level of Working age population, keeping the participation rate constant. Therefore, it is equal to the product between the change in WAP (ΔWAP) [13] and the rate of participation (rop) at the beginning of the period. The latter is the result of the change in participation behavior taking place during the interval considered, and it is equal to the product between the change in the rate of participation and the level of the Labor force at the end of the period.

$$1]\ {}_tTMN_{(t+1)} = {}_t\Delta LF_{(t+1)} - {}_t\Delta E_{(t+1)}$$
$$= [(rop_t * {}_t\Delta WAP_{(t+1)}) + ({}_t\Delta rop_{t+1} * LF_{(t+1)})] - {}_t\Delta E_{(t+1)}$$

All three components of [1] can be positive or negative, depending on the trends in Employment, Labor force and Rate of participation. This implies that also Manpower Needs can be positive or negative.

A negative value of TMN implies that the growth in labor supply has been (or is forecasted to be) smaller than the growth in employment. As we have already stated, a negative difference between the change in labor supply and labor demand identifies a situation of structural lack of labor supply if it is a growing, and long-lasting phenomenon. In a first phase the difference can be, at least partially, satisfied by the unemployed, by an increase in Labor force participation, especially women, by internal migrations from more underdeveloped internal areas. Sooner or later, these additional sources of labor supply will necessarily be exhausted and international migrations will represent the only possible solution.

By converse, a positive value does imply that the country is accumulating an excess of labor supply that cannot be satisfied by local

[13] What we will consider is in fact the natural balance of WAP, which is equal to the difference between generational entries and generational exits inclusive of the deaths registered during the period.

demand[14]. As in the previous case, this situation can be identified as Structural excess of labor supply if it is a growing, and long-lasting phenomenon. In this case, the situation initially can be dealt with by an expansion of the informal economy, a widening of the average dimension of the family and by a reduction in the participation rate, especially of women. However, in the long run, only massive migration flows can solve the problem. In their absence, a growing number of young people will find themselves without any perspective for the future, and could be willing to do anything because a life without job is also a life without value. Also in this case, in the long run only migration can provide a solution to the problem

A few final considerations are needed. In the first place what we are considering are the very special situations that have been created, are created and will inevitably be created by the demographic revolution. They are characterized by changes in the level of WAP of such a dimension that cannot be dealt with, on one hand, by wage adjustments or increases in productivity and, on the other, by high rates of growth of employment.

The declines in WAP brought about by the demographic revolution have often such a dimension and will span over such a long period that it is totally unrealistic to assume that labor productivity could grow enough to both offset the decline in labor supply and allow production to grow. Let's for instance consider the case of Japan. According to the Population Division medium variant scenario, between 2010 and 2060, the WAP (15-64) of Japan is expected to decline by 34.8 per cent, from 81 to 53 million. The direct implication is that in order to avoid more immigrants than the 2.8 million hypothesized by the UNPD, labor productivity should increase by 34.8 percentage points more[15] than the percentage growth in production[16].

Given that the increase in labor productivity does not represent a viable alternative to migration, do other alternatives exist? The only economically viable alternative is to move production abroad. However it has been rightly observed: "As its economy matured and its population aged, a country could safely become a rentier state, boosting its economic product, and in particular paying its pensions, with the income from its international investments. The more youthful countries on the receiving end would no doubt prefer the inflow of capital to an outflow of labor. In the world as it is, however, that may be a less prudent portfolio diversification by an ageing society of retirees than an hostage to fortune." [17] In practice, the delocalization of production is a viable economic solution, but it presents risks that a country could not be willing to take.

[14] It should be obvious that in all the countries that find themselves in this situation the real wage already at or below the subsistence level cannot be an answer to the problem.

[15] In the last 50 years production has increased more than productivity in all industrialized countries as shown by the fact that in the long run employment has increased in all of them, declining only in periods of heavy restructuring of the production structure or of economic crisis. It must also be recalled that the larger the service sector the more difficult is to achieve high rate of growth of productivity or, stated in another way, the employment-income elasticity tends to be low in post industrial economies.

[16] This is implicit in the fact that the growth in employment is identically equal to the difference between the rate of growth in production an the rate of growth in productivity.

[17] McNicoll, D. 2000

The situation of excess labor supply generated by the Demographic revolution normally takes place in countries still largely dominated by the agricultural sector and in which the process of modernization requires not only the expansion in the employment level of Industry and Services, but also a growth in the employment level of these two sectors sufficient to replace non productive jobs in agriculture. Initially, the most probable outcome is that agriculture absorbs the excess of labor supply determining the situation described in Lewis seminal article in which the real wage is at subsistence level. However, with time large migration flows could be the only available mean to avoid the spread of poverty and income inequality.

The last point we have to consider is the relationship between Manpower needs and migration flows. In general we can say that the level of migration is positively related to manpower needs:

$$2] \quad Migr = B\ TMN$$

where B is equal to or greater than 1. At the beginning of any economic emigration process, only workers will move to the destination country. With time, they will be eventually reached by some members of the family. Therefore, at the initial stage B is equal to 1 and will then progressively increase. Previous analyses have shown that at present, in countries of old migration, B is equal to approximately 1.5[18].

5 ASEAN MIGRATION IN THE INTERNATIONAL CONTEXT

ASEAN includes countries like Philippines and Indonesia whose workers are migrating not only within ASEAN and to other Asian countries, but also to Europe, America and Australia, while Singapore, Thailand and Malaysia are becoming prominent arrival countries. To provide some more solid reference points to the forecasting exercise we are going to present in the following paragraphs, we deem relevant to present a concise overview of the tendencies in international migrations and project the migratory behavior of ASEAN countries against the general background of the Asian continent.

Between 1950 and 2010, international migration flows have been characterized by three main trends: i) a substantial increase in the total level; ii) a notable increase in the percentage of intercontinental flows; iii) very relevant changes in the structures of both arrival and departures flows by area and continent.

Between 1950-55 and 1990-95 international migration flows have increased almost fourfold, from 6 to 28.6 million, a value that still marks the historical maximum. After a small contraction registered in the last five years of the century, between 2000 and 2010, around 54 million people have left their native countries, bringing the total number of world migrants in the last sixty years above the 200 million mark (Table A1).

Between 1950 and 1960, intercontinental migration flows represented 48 per cent of total international migration flows (6.7 million out of 14 million); between 2000 and 2010 the percentage has increased to 62 per cent (34 out of 54 million) (Table A1).

[18] M. Bruni, 2009

In the former period, intercontinental migration flows were generated, in order of importance, by Europe, Africa and South America, while the main areas of arrival were the New World Countries (NWC: USA, Canada, Australia, and New Zealand) and Asia. In the latter period, departures were generated mostly by Asia, Central and South America, and Africa, while the main areas of arrival were Europe, NWC and Gulf Countries (GC). Therefore, in only sixty years, Europe has become the main area of arrival, while Asia has become the world major supplier of labor.

Between 1950 and 1960, the NWC were the main pole of attraction of international migration flows. They received around half a million migrants per year, i.e. 36.4 per cent of total migration flows. Western Europe (with France and Germany, but also Switzerland, Belgium and Sweden) was the second pole of attraction. Brazil, Argentina and Venezuela represented the third pole of attraction (Table A2).

Fifty years later the situation has radically changed. As we have already seen, Europe has become the main port of arrival, while the Countries of the Gulf have become the third largest pole of attraction after the NWC. Eastern, Central and especially Southern Asia, Central and Southern America, Northern, Eastern and Western Africa are now the areas that provide labor to the rest of the world. More specifically, on one hand:

- Europe has received 20.1 million migrants [19];
- Arrivals in the NWC have been in excess of 15 million; 72.8 per cent have chosen the US, 11.7 per cent Australia, 4.3 per cent Canada and 1.3 per cent New Zealand;
- The GCs have attracted 8.7 million immigrants, 3.9 million of which went to the Arab Emirates and 2.8 million to Saudi Arabia.

On the other hand, both Latin America and Africa had negative migration balances of respectively 11.2 million[20] and 6.3 million[21].

Beside the six Gulf countries, other 15 Asian countries have registered positive migration balances so that the total number of arrivals has exceeded 14 million, while 27 countries have been affected by negative migration balances for a total amount of 30.6 million. Therefore, the continental migration balance has been negative and equal to around 16 million (Table A3).

After the two largest gulf countries (Arab Emirates and Saudi Arabia), the main arrival country has been Thailand, followed by Qatar and Singapore. The list of Asian arrival countries includes other 5 countries in

[19] Of the 40 European countries 27 are arrival countries and 13 departure countries. The main arrival countries have been, in order of relevance, Spain, Italy, the Russian Federation, and the United Kingdom, followed by the more traditional arrival countries such as France and Germany, together with Sweden, Belgium and Austria. Exits from the departures countries have been only 1.8 million.

[20] Between 2000 and 2010 only 8 Latin America countries have registered a positive migration balance, and for a very modest total value of 0.4 million. Negative migration balances, for a total value of 11,6 million, have been registered by the other 28 countries. Mexico with 4.4 million (37.9 per cent of the total) leads the ranking followed by Peru, Brazil, El Salvador and Guatemala.

[21] In Africa 16 countries have registered positive migration balances for a total value of almost 4 million; 36 have registered negative migration balances summing to more than 10 million. South Africa (1.6 million) has been the most important arrival country followed by Burundi and Sierra Leone, both accounting for more than half a million immigrants. The ranking of arrival countries is lead by Zimbabwe, followed by Morocco, Ivory Cost, Guinea and Egypt.

Eastern Asia, (Azerbaijan, Cyprus, Israel, Jordan, and Lebanon), but also Afghanistan and Bhutan, Hong Kong and Macao, Malaysia, Brunei and Japan. If the main country of departure has been India -that has generated almost half a million migrants per year- other 5 countries have registered more or about 250,000 departures per year: Bangladesh, China, Pakistan, Indonesia and Philippines. These six countries are between the seven most important departure countries, the other being Mexico, that ranks second after India (Table A2).

In conclusion, of the 21 Asian arrival countries, 4 are ASEAN countries, Thailand and Singapore being respectively the third and fifth more relevant arrival countries in Asia. At the same time, other two ASEAN countries, Philippines and Indonesia, are fifth and sixth in the Asian ranking of departures countries and sixth and seventh in the world ranking[22].

6 LABOR MARKET AND DEMOGRAPHIC SCENARIOS

We will now propose some Manpower Needs and Migration scenarios for the three ASEAN countries that have registered the largest positive migration balances during the 2005-2010 period: Singapore, Thailand and Malaysia[23]. The scenarios have been constructed on the basis of the model we have previously introduced.

The scenarios are relevant not only because Singapore and Thailand are the two ASEAN countries that have reached the most advanced stage of the demographic revolution, but because they will be the firsts to register a negative natural balance of WAP (15-64) that will then progressively increase in absolute value. Malaysia, while having progressed a lot in terms of life expectancy and infant mortality is still characterized by a rather high TFR and, according to the Population Division, its TFR is expected to decline at much lower speed than those of the other ASEAN countries. However, as we have already seen, Malaysia has already been receiving a relevant, although smaller than in the past, number of migrants.

6.1 Main tendencies of the labor market in Singapore, Thailand and Malaysia

Between 2005 and 2010, Singapore, Thailand and Malaysia have registered notable percentage increases in the level of employment (Table 9), the record value (34.4 per cent) being that of Singapore, followed by Malaysia (10.8 per cent), and Thailand (7.9 per cent). Despite the positive migration flows registered during the same period, in Singapore and Thailand the Labor force has grown less than employment. Therefore, both countries have registered a decline in the level of unemployment, and obviously an even more pronounced decline in the rate of unemployment. In Malaysia, Labor force has increased slightly more than employment, but the unemployment rate has declined. Taken together, the 3 countries have

[22] The average yearly values have been: 144,000 (Singapore), 98,000 (Thailand) and 17,000 (Malaysia).
[23] The other country to register a positive migration balance has been Brunei.

generated, over the five-year period, 4.6 million jobs, equal to a percentage increase of 9.8 per cent, while the Labor force has expanded by 4.4 million.

Table 9 - Singapore, Thailand and Malaysia; main labour market variables and indicators; 2005 ad 2010

	2005	2010	Abs. change	% change	2005	2010	Abs. change	% change
	Singapore				Thailand			
Employment	2,267	3,047	781	34.4	35,257	38,037	2780	7.9
Unemploymen	101	89	-12	-11.6	663	402	-261	-39.3
Labour force	2,367	3,136	769	32.5	35,920	38,440	2519	7.0
WAP (65 +)	3,376	4,198	822	24.4	48,942	52,856	3914	8.0
roa	70.1	74.7	4.6	6.5	73.4	72.7	-0.7	-0.9
roe	67.1	72.6	5.4	8.1	72.0	72.0	-0.1	-0.1
rou	4.2	2.8	-1.4	-33.3	1.8	1.0	-0.8	-43.3
	Malaysia				Total			
Employment	10,045	11,129	1084	10.8	47,569	52,214	4645	9.8
Unemploymen	368	388	20	5.4	1,132	879	-253	-22.3
Labour force	10,414	11,517	1104	10.6	48,701	53,093	4392	9.0
WAP (65 +)	16,451	18,369	1918	11.7	68,769	75,423	6654	9.7
roa	63.3	62.7	-0.6	-0.9	70.8	70.4	-0.4	-0.6
roe	61.1	60.6	-0.5	-0.8	69.2	69.2	0.1	0.1
rou	3.5	3.4	-0.2	-4.7	2.3	1.7	-0.7	-28.8

Sources - National data from various sources

As we have already seen, according to the United Nation Population Division, between 2005 and 2010, Singapore, Thailand and Malaysia have registered net migration balances of respectively 720,000, 490,000 and 85,000 people, for a grand total of 1,295,000, a value that, as we will see later, does probably largely underestimate the real value. It is therefore evident that without migrants the growth in labor supply would have been insufficient to face the growth in labor demand: in Singapore migrants have covered almost the total increase in labor demand (95.2 per cent), in Thailand 17.6 per cent and in Malaysia around 11 per cent. Therefore, migrants have covered 30 per cent of the 4.6 million total increase in employment registered by the three countries taken together.

6.2 Hypothesis and computational procedures

In order to provide some indications on the probable trends in the number and typology of migrants that will be needed by Singapore, Thailand and Malaysia in the next 25 years, we have proceeded to build for each countries labor market and demographic scenarios for the period 2010-35, articulated on five-year periods. As indicated in a previous paragraph, the future level of the Migration balance of these three countries will depend mainly on their Manpower needs that, in their turn, will be the result of the trends in labor supply and labor demand.

We recall, first of all, that our scenarios will be based on population, employment and labor force 15 years and older. This choice has been imposed by the fact that all three countries are characterized by a large labor market participation of people above 64 years of age, and by the consideration that this segment of potential supply is going to increase enormously in the next 25 years, as shown in table 10.

Due to its high TFR Malaysia has remained the youngest of the three countries we are considering with a percentage of elderly of only 4.8 per

cent versus values of 8.9 and 8.7 per cent in Singapore and Thailand. According to the Medium variant projection of the Population Division, in the next 25 years, the percentage of elderly will reach 14.5 per cent in Malaysia, 19.6 per cent in Thailand and 26.9 per cent in Singapore.

Table 10 -Singapore, Thailand and Malaysia; Population 65 year and older; 2010-35

	Singapore		Thailand		Malaysia	
	Abs. value	%	Abs. value	%	Abs. value	%
2010	454	8.9	6,002	8.7	1,368	4.8
2035	1,634	26.9	14,284	19.6	4,461	14.5
Diff.	1,180	17.9	8,282	10.9	3,093	9.7

Source - Author elaboration on Population Division data, United Nations, 2011a

Coming now to our computations, the absolute change in labor supply for each of the five year period from 2010-2035 has been estimated by i) computing the absolute change in WAP for each period and ii) multiplying it by the 2010 rate of participation. We must point out that:

- We have considered only one demographic scenario based on the Medium variant projection of the Population Division, the reason being that the other scenarios do not present notable differences since: i) the people who will enter WAP in the next fifteen years are already born; ii) those that will enter WAP in the following 10 years are those that will be born in the next 8 years and no dramatic changes in the TFR are at present foreseeable; iii) all the UN scenarios adopt the same hypotheses on mortality.
- According to the previous model, another element that affects the trend in the level of labor supply is the rate of participation, or more specifically its changes over time. As we have already suggested, Singapore and Thailand boost extremely high participation rates (74.7 and 72.7 per cent) that have been increasing under the pressure of and expanding demand. In Malaysia the rate of participation is about ten points lower (62.7 per cent) due to the limited presence of women in the labor market. Are these national rates going to converge? Up to now, in developed countries the process of modernization has brought strong reduction in the labor market presence of the elderly; however, it is already evident that the lengthening of the training phase, the ageing process together with the improvement in health conditions and the restriction in the welfare system imposed by much tighter economic situations are going to push in the opposite direction and keep older people in the labor market longer than at present. This would seem to suggest that in Singapore and Thailand opposite forces could maintain the rate of participation at around the present value. In Malaysia the situation presents an additional factor, the behavior of the cohorts of young girls entering the labor market in the next years. If it is possible that

the rate of participation of the next cohorts will be higher than that of the previous generations, their contribution to labor market participation could be countered by the fact that both boys and girls will tend to remain longer in the training phase of life. In conclusion, due to the lack of strong evidences in one direction or on the other we have assumed a constant rate of participation.

For Thailand and Malaysia, the absolute change in labor demand has been computed on the basis of two alternative hypotheses: i) a constant rate of growth equal to the one registered between 2005 and 2010 (scenario A); ii) a constant employment growth equal to the absolute growth registered in the same period (Scenario B). In scenario A the absolute change in employment increases progressively, in scenario B the percentage rate of growth declines progressively. In substance, the first scenario is more optimistic, but probably less realistic.

In Thailand, in Scenario A, employment increases of around 17.5 million (46.2 per cent) over 25 years, while in Scenario B employment grows by little less than 14 million (36.5 per cent) (Table A4). In Malaysia, in Scenario A, employment grows by 7.5 million (66.9 per cent), in Scenario B by 5.4 million (48.7 per cent) (Table A8).

In the case of Singapore the construction of the scenario had to acknowledge the fact that between 2005 and 2010 employment has grown by an astounding 34.4 per cent. The adoption of such a rate would produce what appears as a totally unrealistic growth in employment (from a little more than 3 million in 2010 to around 11.5 million in 2035). For Scenario A we have therefore assumed a constant average growth rate equal to half that registered between 2000 and 2010. Such a rate, 22.5 per cent, is still more than the double of that adopted for Malaysia (10.8 per cent) and that adopted for Thailand (7.9 per cent). With this assumption Employment grows to around 8.5 million, i.e. 179 per cent.

In analogy with what was done for Thailand and Malaysia, Scenario B assumes a growth in the level of employment equal to that registered between 2005 and 2010 (781,000). In this scenario the rate of growth progressively declines from an initial value of 25.6 per cent during the first five-year period, to 12.7 per cent between 2030 and 2035 and total employment increases from 3 to almost 7 million.

Since in the long run both scenarios could be too optimistic, a third Scenario (Scenario C) is proposed. In this scenario the initial growth rate of employment, taken equal to the one used in Scenario A, is progressively halved down to a value of 1.4 per cent in the last five-year period. In this Scenario the growth in employment is obviously much more limited and equal to 1.5 million over the entire period, a value which however corresponds to a 51 per cent increase over the 2010 value.

The following step has been that of comparing the increase in supply with the increase in labor demand proposed by each scenario in order to estimate whether and how much of the additional labor demand can be covered by the local labor supply, over the next 25 years.

6.3 Manpower Needs

The results of the exercise are summarized in table 11 that presents the Total Manpower Needs that Singapore, Thailand and Malaysia will have to face in the next 25 years in the two scenarios we have previously described. The detailed analysis is presented in the Statistical Annex (Table A4 for Thailand, Table A6 for Singapore, and Table A8 for Malaysia).

Let's observe first of all that in both Singapore and Thailand the absolute changes in labor supply will progressively decrease to become negative in the 2030-35 period. The situation is totally different in Malaysia where the absolute change in Labor force will peak around 2020 and will then decline very slowly in the following years[24].

Table 11 - Singapore, Thailand and Malaysia; Total manpower needs; 2010-2035

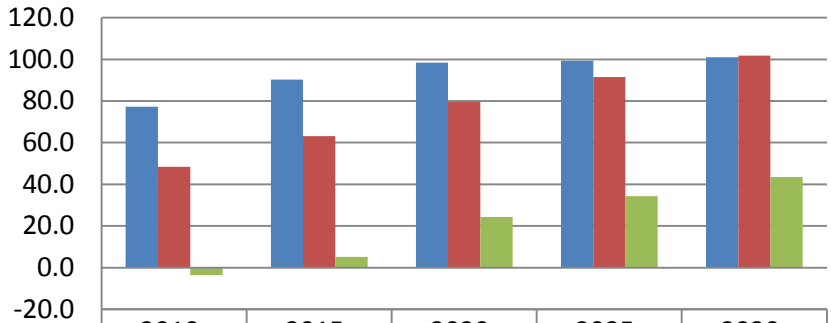
	Singapore	Thailand	Malaysia	Total
	Manpower needs			
2005-2010	-720	-490	-85	-1,295
	enario A: Constant rate of employment grow			
2010-2015	-535	-1,452	43	-1,944
2015-2020	-768	-2,043	-68	-2,879
2020-2025	-1,026	-2,775	-358	-4,159
2025-2030	-1,272	-3,444	-559	-5,275
2030-2035	-1,587	-4,138	-788	-6,512
Total	-5,188	-13,851	-1,730	-20,769
Yearly average value	-208	-554	-69	-831
% distribution	25.0	66.7	8.3	100.0
	Manpower needs			
	Scenario B: Constant employ. growth			
2010-2015	-623	-1,233	160	-1,695
2015-2020	-698	-1,588	178	-2,108
2020-2025	-763	-2,064	32	-2,795
2025-2030	-772	-2,457	-10	-3,239
2030-2035	-795	-2,854	-62	-3,712
Total	-3,652	-10,196	298	-13,549
Yearly average value	-146	-408	12	-542
% distribution	26.9	75.3	-2.2	100.0
Sources - National data from various sources				

[24] If we had used WAP (15-64) the change of sign in Singapore and Thailand would have taken place in the 2015-20 period. The difference we register is due to the ageing process we have previously discussed.

The growth in employment hypothesized in scenario A provokes very large and increasing Manpower needs that sum up to almost 21 million over the 2010-2035 period. Sixty seven per cent would be originated by Thailand (13.9 million), 25 per cent by Singapore (5.2 million), and 8.3 per cent by Malaysia (1.7 million). In Singapore the ratio between Manpower needs (in absolute value) and changes in employment surges from 77.2 per cent in 2010-15 to 90.3 per cent in 2015-20, to then progressively increase to a value of 101 per cent in 2030-35 (Graph 6). In Thailand this ratio is always smaller than in Singapore until the end of the 2020s, but then leaps to 101.8 in the 2030-35 period. As we have already underlined, in Malaysia the growth in labor supply will be relatively much more pronounced since the drop in fertility has been more limited than in Singapore and Thailand. As a consequence, the local Labor force should be more than sufficient to cover the additional jobs created in the 2010-15 period. Manpower needs become negative in the following interval and will then progressively increase to represent 43.5 per cent of additional employment in 2030-35.

Scenario B (that assume a constant growth in the level of employment and therefore a declining rate of growth) generates a lower amount of Manpower needs (13.5 million) and some other qualitative differences. The distribution of Manpower needs between the three countries is more skewed, with Thailand accounting for 75.3 per cent, Singapore for 26.9 per cent and Malaysia presenting an overall negative value.

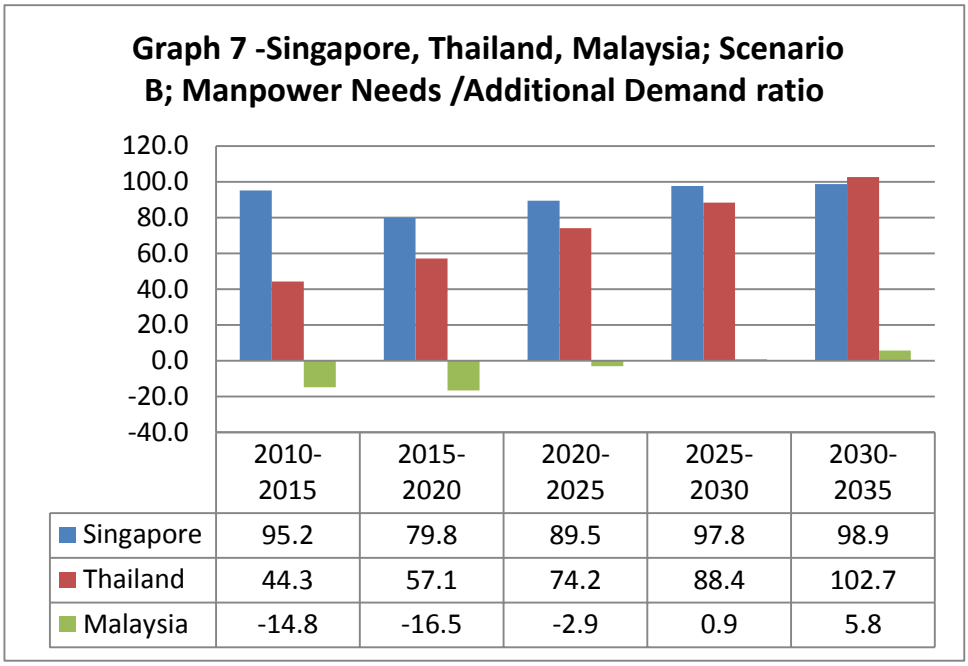
Graph 6 - Singapore, Thailand, Malaysia; Scenario A; Manpower Needs /Additional Demand ratio



	2010-2015	2015-2020	2020-2025	2025-2030	2030-2035
Singapore	77.2	90.3	98.4	99.3	101.0
Thailand	48.4	63.1	79.5	91.4	101.8
Malaysia	-3.6	5.1	24.3	34.2	43.5

In the case of Thailand the results of Scenario B are very similar to those of Scenario A, the percentage of manpower needs with respect to labor demand progressively increasing to reach a value above 100 in 2035. In the case of Malaysia local labor supply appears to be sufficient to face the growth in employment outlined in Scenario B until 2030. Finally, in Singapore manpower needs represent around 95 per cent of the increase in employment in the first period, decline to 80 per cent in the following time

interval to then increase again to almost 100 per cent during the 2030-35 period.



	2010-2015	2015-2020	2020-2025	2025-2030	2030-2035
Singapore	95.2	79.8	89.5	97.8	98.9
Thailand	44.3	57.1	74.2	88.4	102.7
Malaysia	-14.8	-16.5	-2.9	0.9	5.8

Source: Author elaboration on National data

In Singapore, scenario C produces a much more conservative forecast of Manpower needs that would be equal to only around 1.3 million for the entire period. Moreover, they would be decreasing through time in parallel with the rate of growth in employment. Also in this case, however, manpower needs will end up being in excess of the increase in employment in the 2030-35 time-interval.

6.4 A clarification of the previous results from a flow perspective

Before summarizing the conclusion suggested by the previous analysis, it is important to clarify the exact meaning of the percentages of Manpower needs we have just presented and more specifically why this percentage can exceed 100 per cent and what does it mean. In order to do so we have to move from a stock to a flow representation of the labor market. This clarification provides some relevant inputs also for the analysis of the relationship between education and vocational training, on one hand, and economic growth and development, on the other.

The increase in employment represents just one part of the number of "new" young people that are needed in any given interval by the labor market, the total number being equal to the sum of i) the people needed to substitute the employed that have definitely left the Labor force for one of the following three reasons: retirement, death, and migration, and ii) the people needed to cover the additional jobs created by the market as a consequence of the increase in production. In other terms, the Labor demand in terms of flows (LDF) (which is measured by generational entries, i.e. first time entries into employment) is equal to the sum of Replacement demand

(RD) (that is measured by the number of people needed to substitute definitive exits from employment) and Additional demand (AD) (measured by the people needed to cover the Additional jobs created in the interval).

$$3] \quad LDF = RD + AD$$

In substance, the ratio between Manpower needs and increase in employment tells us which quota of Additional demand cannot be covered by the local labor supply in terms of flows, i.e. by the people that have entered the labor market for the first time during the interval we are considering.

To exemplify the previous statements, let's consider Singapore in Scenario A. As we have already seen, in the 2010-15 period manpower needs represent 77.2 per cent of the increase in the level of employment. This means that the local labor supply in terms of flow is sufficient i) to fully replace definitive exits from the market (RD), and ii) to satisfy 22.8 per cent of the Additional demand. When we reach the 2030-35 interval, the ratio between the manpower needs and the growth in employment is equal to 101 per cent. In substance, at that time the local labor supply will not be sufficient even to fully cover Replacement demand.

7 MANPOWER NEEDS AND MIGRATION FLOWS

7.1 The stock of migrants in ASEAN countries

The presence of a structural need of migrants is by now extremely evident in Singapore, Thailand, Malaysia and Brunei. Table 12 reports the data on the stock of migrants present in ASEAN countries according to the latest United Nations estimates.

Table 12 - ASEAN countries; stock of migrants, percentage of migrants 20 and above, percentage of female migrants; 2010

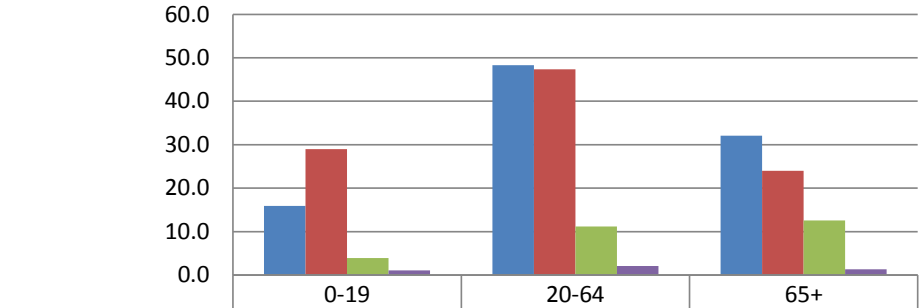
	Number of migrants		% of migrants 20 years old and above	F/T
	Abs. Value	% comp.		
Malaysia	2,358	35.2	82.0	45.2
Singapore	1,967	29.4	83.4	56.0
Thailand	1,157	17.3	81.9	48.4
Philippines	435	6.5	57.1	51.1
Cambodia	336	5.0	62.9	51.7
Brunei	148	2.2	84.7	45.5
Indonesia	123	1.8	78.3	44.5
Myanmar	89	1.3	75.8	48.7
Viet Nam	69	1.0	72.1	36.6
Laos	19	0.3	72.0	48.0
Total	6,701	100.0	79.6	49.6

Source - Author elaboration on Population Division data, 2011b

According to this source, of the 6.7 million migrants present in ASEAN 84 per cent are in the four arrival countries and, more specifically, 35.2 per cent in Malaysia, 29.4 per cent in Singapore, 17.3 per cent in Thailand and 2.2 per cent in Brunei. Since these migrations have been determined by economic reasons, the four countries are also characterized by the highest percentages (all well above 80 per cent) of migrants in working age. In Brunei and Singapore migrants (or more specifically foreign citizens in Brunei and foreign born population in Singapore) represent almost 50 per cent of the population in the 20-64 age group, the value for Malaysia being 11.2 per cent, while according to the same source in Thailand the foreign born population in this age group represent only 2 per cent of the total (Graph. 8). It is also interesting to observe that Brunei has the highest incidence of foreign elderly (a fact that signal that immigration in this country is a old phenomenon), while Singapore has the highest percentage of children showing that recent immigration is made up mainly of young people in reproductive age.

As a matter of fact available information suggests that while estimates for Singapore are sufficiently correct, the data for Thailand and Malaysia largely underestimate the number of migrants.

Graph 8 - Brunei, Singapore, Thailand and Malaysia; percentage of migrants on local population by main age group; 2010



	0-19	20-64	65+
Brunei Darussalam	15.9	48.3	32.1
Singapore	29.0	47.3	24.0
Malaysia	3.9	11.2	12.5
Thailand	1.0	2.0	1.3

Source – our elaboration on Population Division 2011b

According to the 2011 Thailand Migration Report[25], the foreign population working and residing in Thailand is in excess of 3.5 million, three times as much as the Population Division estimate[26]. This would bring

[25] "There are more than 3.5 million persons without Thai nationality living in the country, including many long-term residents and children of migrants born in Thailand. More than 3.0 million of them are working in the country; "Jerrold W. Huguet and Aphichat Chamratrithirong (eds), 2011; p. XII

[26] According to the Report: "In recent decades Thailand has evolved into a regional migration hub in South-East Asia, and is concurrently a country of origin, transit and destination for large numbers of both regular and irregular international migrants. With a dynamic economy, there is also a great deal

the percentage of the foreign population to around 4 per cent. More specifically, according to the Thai Ministry of Interior (MOI), there are a total of 2.46 million low-skilled migrants from the three neighboring countries (Myanmar, Cambodia and Laos). According to the same source, some two million migrants are currently enrolled at some stage of the country's complex registration process for migrant workers and an estimated one million migrants and family members are unregistered. Women account for around 45 per cent and children for 11 per cent of the migrant population.

For what relates to Malaysia the figure presented above refers to legal immigrants. There is however a general consensus that at present Malaysia hosts around two million migrants that should be legalized by an ongoing procedure that started in July 2011. Also in this case the number of migrants would then double with respect to the official figures.

7.2 The migration scenarios

The previous data provide the necessary background for an evaluation of the migration scenarios. As we have already suggested, the number of migrants that a country receives does depend not only on the number of jobs that cannot be covered by the local Labor force, but also on the number of dependents that will accompany, or join in a second moment, the workers. We can, at one extreme, imagine that the number of migrants will be exactly equal to the amount of workers needed by the arrival country. This situation characterizes the initial phase of the immigration process and also subsequent phases if the migration quotas set by the arrival country are not coherent with labor markets needs and, therefore, a very large number of arrivals takes place in risky, illegal situations. Subsequently, when more proper quotas are decided or workers start to be legalized and the possibility of family reunion allowed by the local legislation, the number of dependants tends to increase. It has been estimated that at present in developed countries we can expect 1.5 arrivals[27] for each job position that needs to be covered by an immigrant worker.

Since Southeast Asia countries can be considered in the initial phase of the migration process, the number of immigrants has been computed, both for Scenario A and B, on three alternative hypothesis:

i) B=1
ii) B=1.15
iii) B=1.3

Considering the six cases reported in table 13, the number of immigrants will range:

- In Singapore, from 3.6 million (B1) to 6.7 million (A3)
- In Thailand, from 10.2 million (B1) to 18 million (A3)
- In Malaysia, from a slightly negative value with positive inflows starting in 2025 (B1) to 2.2 million (A3)

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of internal migration, including circular and seasonal migration. However, the highly dynamic nature of migration trends and patterns in Thailand makes the timely formation of comprehensive and coherent migration policies very challenging."

[27] M. Bruni, 2009

Table 13 - Singapore, Thailand, Malaysia; number of migrants (thousand) in alternative scenarios of manpower needs and international labour supply reactivity; 2010-2035

	Migrants											
	Singapore	Thailand	Malaysia	Total	Singapore	Thailand	Malaysia	Total	Singapore	Thailand	Malaysia	Total
	B=1				B=1.15				B=1.3			
	Scenario A											
2010-15	535	1,452	-43	1,944	615	1,670	-50	2,235	696	1,888	-56	2,527
2015-20	768	2,043	68	2,879	883	2,350	78	3,311	998	2,656	89	3,743
2020-25	1,026	2,775	358	4,159	1,180	3,191	412	4,783	1,334	3,607	466	5,407
2025-30	1,272	3,444	559	5,275	1,462	3,960	643	6,066	1,653	4,477	727	6,857
2030-35	1,587	4,138	788	6,512	1,825	4,758	906	7,489	2,063	5,379	1,024	8,466
Total	5,188	13,851	1,730	20,769	5,966	15,929	1,990	23,885	6,744	18,007	2,249	27,000
	B=1				B=1.15				B=1.3			
	Scenario B											
2010-15	743	1,233	-160	1,815	855	1,418	-184	2,088	966	1,603	-209	2,360
2015-20	623	1,588	-178	2,032	716	1,826	-205	2,337	810	2,064	-232	2,642
2020-25	698	2,064	-32	2,730	803	2,373	-37	3,140	908	2,683	-41	3,549
2025-30	763	2,457	10	3,231	878	2,826	12	3,715	992	3,195	13	4,200
2030-35	772	2,854	62	3,688	887	3,283	72	4,242	1,003	3,711	81	4,795
Total	3,599	10,196	-298	13,497	4,139	11,726	-343	15,522	4,679	13,255	-388	17,546

Source - Author elaboration on National data

The net inflow in the three countries over the next 25 years is therefore forecasted between 13.5 (B1) and 27 million (A3). Since at this point of the game, the supply of local labor cannot be manipulated by state intervention and our Labor force forecast has been designed in such a way to represent an over-estimate, the amount of immigrants will depend on two variables: the development path chosen by each country and the growth in employment that will be generated.

We can, moreover, observe that the amount of immigrants we are forecasting is basically on line with what has happened in the last 25 years once we take into consideration that local WAP was expanding at that time, while in the next 25 it will decline.

It could be objected that the most important international Institution that provides demographic forecasts, the Population Division, has published much lower migration estimates. These data that we have reported in Table 14 deserve some comments.

Table 14 -ASEAN countries; number of migrants 1985-2010 and estimates 2010-35, medium variant scenario of the Population Division; thousand; 1985-2035

	Malaysia	Thailand	Singapore	Brunei	Indonesia	Philippines	Vietnam	Myanmar	Laos	Cambodia	ASEAN		
											Arrival countr.	Depat. countr.	Balance
1985-90	460	505	120	5	-265	-300	-330	-135	0	150	1,090	-880	210
1990-95	320	-1,110	230	5	-720	-695	-315	-125	-30	155	-555	-1,730	-2,285
1995-00	420	595	255	5	-775	-775	-285	5	-85	95	1,275	-1,820	-545
2000-05	395	1,105	230	5	-1,185	-1,130	-430	-1,000	-115	-120	1,735	-3,980	-2,245
2005-10	85	490	720	5	-1,295	-1,235	-430	-500	-75	-255	1,300	-3,790	-2,490
1985-2010	1,680	1,585	1,555	25	-4,240	-4,135	-1,790	-1,755	-305	25	4,845	-12,200	-7,355
2010-15	85	395	175	5	-1,005	-1,000	-210	-100	-75	-130	660	-2,520	-1,860
2015-20	85	390	125	5	-950	-940	-200	-50	-75	-65	605	-2,280	-1,675
2020-25	85	385	125	5	-895	-890	-200	-50	-75	-35	600	-2,145	-1,545
2025-30	85	385	120	5	-805	-800	-200	-50	-75	-10	595	-1,940	-1,345
2030-35	85	380	120	5	-720	-720	-200	-50	-75	-10	590	-1,775	-1,185
2010-2035	425	1,935	665	25	-4,375	-4,350	-1,010	-300	-375	-250	3,050	-10,660	-7,610
Diff.	-1,255	350	-890	0	-135	-215	780	1,455	-70	-275	-1,795	1,540	-255

Source - United Nations, 2011a

We observe, first of all that the Migration balance for ASEAN as a whole, with respect to the 2010-2035 period, is slightly higher in absolute value than that registered between 1985 and 2010 (-7.6 million versus -7.4 million), but the overall mobility is forecasted to decline as a result of a sharp contraction of both the inflows in arrival countries and the outflows from departures countries. The firsts decline from 4.8 million to 3 million, the seconds from 12.2 to 10.7 million. More specifically for what relates to arrival countries, inflows are expected to decline in Malaysia (-1.3 million)

and Singapore (-0.9 million), and to increase, although very marginally, in Thailand (+350,000). Outflows are expected to decline in all departure countries, but Vietnam.

In order to understand these data, we must keep in mind that they are not a forecasts based on a model or an extrapolation of past values, but a hypothesis (an educated guess) made on the basis of two considerations: 1) past international migration estimates, and 2) consideration of the policy stance of each country with regard to future international migration flows. It is also evident that in the case of Singapore and Malaysia the policy stands of the two governments have been given a bigger weight than economic considerations.

7.3 The impact of migration on total population

We have just seen that, over the next 25 years, the Population Division forecasts the arrival of 3 million migrants in Singapore, Thailand, Malaysia and Brunei, while our scenarios suggest that the value will be between 13 and 27 million, depending on the rate of employment growth. As a consequence, we also forecast very different demographic trends

It has been stated (and the demographic scenarios proposed by the Population Division endorse this statement as shown in Table 15) that the drop in fertility below replacement level that is affecting an increasing number of developed and developing countries will produce a decline in Total population, an even more pronounced decline in Working Age Population and progressive ageing phenomena that will seriously threaten the sustainability of the present level of production and of the welfare systems of these countries.

Table 15 - Singapore, Thailand and Malaysia; population by main age group; Medium variant projection; 2010 and 2060

		0-14	15-64	65+	totale
Singapore	2010	884	3,742	454	5,080
	2060	854	3,196	1,962	6,012
Thailand	2010	14,195	48,786	6,002	68,983
	2060	9,900	39,871	18,357	68,128
Malaysia	2010	8,617	18,432	1,368	28,417
	2060	8,421	29,032	7,924	45,377
Source - United Nations, 2011a					

This does necessarily happen in a closed population or in a situation in which the migration balance is not assumed (or allowed) to cover the manpower needs created by the contraction in labor supply and the expansion in demand generated by economic growth.

The demographic forecasts for Singapore and Thailand, whose fertility is already below replacement level, are in line with this position.

WAP (15-64) is expected to notably decline in both countries, while the percentage of elderly is expected to dramatically increase. The situation is obviously different for Malaysia where the TFR is still largely above replacement.

The experience of developed countries does, on the contrary, show that the end result of fertility decline is to prompt unprecedented and above replacement net migration flows that increase WAP, raise fertility, and therefore determine significant Total population growth[28].

The model we have proposed, coherently with empirical evidence, brings to the conclusion that the WAP of ASEAN arrival countries will increase, the change being directly related to the rate of growth of employment and inversely related to the rate of natural decline of local WAP (Tables A5, A7, and A9).

8 HUMAN RESOURCES AND ECONOMIC DEVELOPMENT

Education and training have always been considered a fundamental factor in promoting economic growth and social development. However, alternative growth theories have given industrial policies as well as education and vocational training different importance and role[29].

Classical growth models focus on the productivity-enhancing role of technology and human capital. They assume that investments in education and training result in skills, competences and increased capabilities of the workforce and that developing countries have the same capabilities to absorb technologies as the developed countries. The process does automatically take place through spillovers, trade and FDI, learning and increased productivity being a function of the time spent in production (learning by doing). In this context industrial policies play a very limited role, **liberalization** of the product market representing the main drive to growth. No specific educational or vocational training policies are called for to foster economic growth, education and training being only functional to match the skills supply and demand.

In the **institutional approach**[30] the key factor to reach high growth is **diversification** of the production structure, a structural transformation from low productivity, traditional (rural) activities to high productivity, (urban) modern activities, mostly, although not exclusively, in the industrial sector. Productivity grows not because of productivity increases within sectors, but as a result of shifting resources from low productivity to high productivity activities[31]. It has also been argued that the product space and the structure of goods produced determine the capabilities a country has developed, and these capabilities indicate which products or industries a country may easily develop in the future[32]. Industrial policies are, therefore, called upon to

[28] M. Bruni, 2009

[29] For the drafting of this paragraph I am strongly indebted to the following papers: I. Nubler, 2011; M. Cimoli, G. Dosi, and J.E. Stiglitz (eds), 2009, and the presentation of the same book by J. M. Salazar-Xirinachs and I. Nubler, 2010; pp 135-140.

[30] W. Lewis 1954; J. Fei and G. Ranis, 1964.

[31] D. Rodrik, 2009.

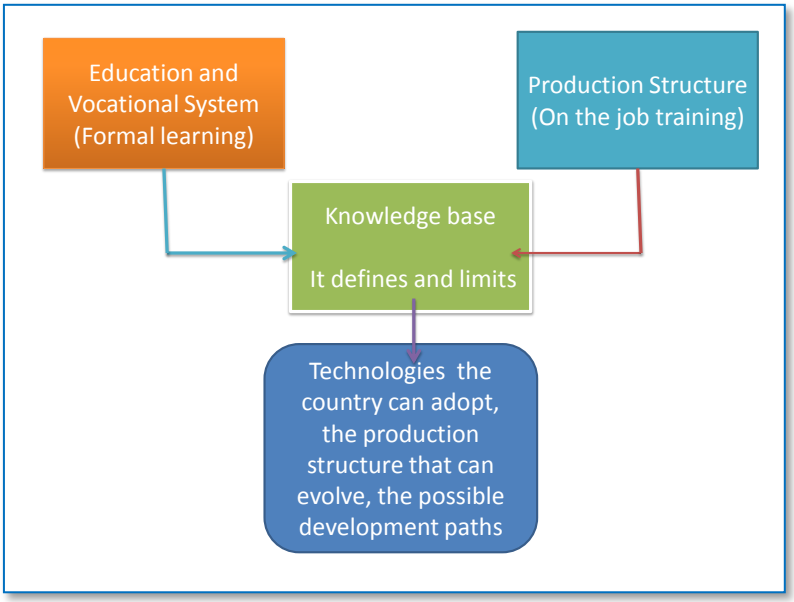
[32] C.A. Hidalgo, and R. Hausmann, 2009.

facilitate a "growth enhancing structural transformation". The challenge is getting the policy approach right by adopting an experimental and creative approach to institutional reforms[33].

According to **New evolutionary economics,** economic development is defined as a process of technological upgrading, of diversification and structural change driven, on one hand, by the accumulation of capabilities and, on the other, by the transformation of the production structure. It is the accumulation of domestic capabilities (that include the development of workers competences, the accumulation of technological and organizational know how in firms, training institutes and governments), which allows moving from the existing knowledge clusters to new knowledge clusters. [34] It is then evident that, according to this approach, not only industrial policies and educational policies can play a central role in fostering economic growth and social development, but they must be designed and implemented in a coordinated way.

In every moment of time the Labor force of a country disposes of a given **knowledge structure.** The knowledge structure is the result of past formal learning processes inside the education and vocational training system and of the training on the job provided by the production structure. In any given moment of time, the knowledge structure defines, the dynamic capabilities of an economy, i.e. determines and limits the technologies the country can adopt, the production structure that may evolve, and therefore the possible paths to economic growth and social development (Figure 1).

Figure 1



[33] It is however been suggested that: "Although this approach recognizes the role of learning and capabilities they are not integrated into the analytical framework and therefore fail to raise policy issues". I. Nubler, 2011; p.8.
[34] M. Cimoli, G. Dosi, and J.E. Stiglitz, 2009 (eds), R. Nelson (2007).

In a first phase economic development can be based upon the incremental diversification of production inside the existing knowledge clusters, i.e. producing more products that require available competences or complementary competences that can be easily acquired.

However, this is not sufficient to speed up development or to start a process of rapid catching up. In order to do so, a country must be able to shift production from low quality activities into "high quality activities", to jump into new knowledge clusters. Empirical and theoretical arguments suggest that the evolution of the knowledge base can play a fundamental role in the catching up process and that successful countries have been able to drive productive transformation by deliberately driving their knowledge structure toward higher diversity and complexity.

Some countries have been inspired by egalitarian principles and have focused on equal access to education, while others have produced polarized educational patterns**.** The countries of the first type have first increased the share of primary, then of lower and higher secondary and finally of post-secondary education. More importantly they have developed a significant share of higher and post-secondary education even at low levels of economic development. In so doing they have been able to shift production into medium technology manufacturing, then diversify production within clusters and finally move to higher technology goods[35]. The second type of countries[36] have generated an educational structure with high shares of people with no-schooling or primary education, on one hand, and of people with post secondary education, on the other. This educational structure provides options in the development of high technology products or advanced services, but limited options for the development of medium technologies. It is also evident that this kind of educational structure cannot produce a relevant economic middle class.

9 THE EDUCATIONA ATTAINMENTS OF ASEAN COUNTRIES

As we have just seen, it is the knowledge structure of the country that defines the options and the dynamic capabilities of an economy, determining which production structure can evolve. The education structure of the population can be used as a proxy of the available capabilities since it provides an indication of the technologies and of the level of complexities that the Labor force can manage.

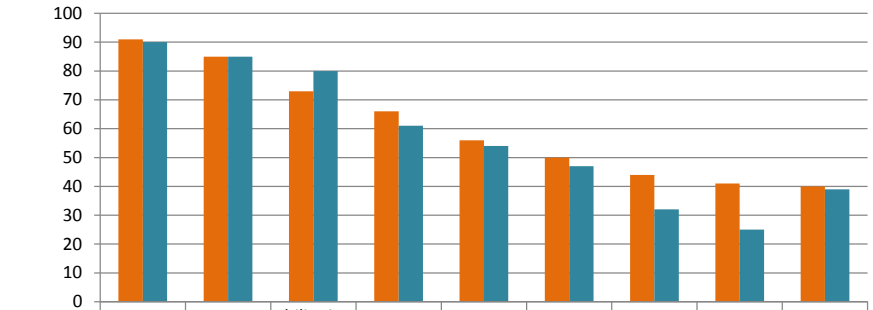
More specifically, we can assume that a country with a strong share of (young) population with lower or upper secondary education embodies strong options to shift its production structure into low and medium technology products since this educational level provides the basis for training craft people, machine operators, technician and clerks which are required by more complex manufacturing sectors. However, it is only a high share of post-secondary education that will allow developing the economic, administrative, technical competencies together with the managerial skills

[35] China and Korea belong to this group.
[36] This group includes many Latin America countries including Argentina, Brazil and Chile, but also India and Thailand.

and business leadership required to shift the economy toward medium and high technology goods and advanced services

The different levels of economic development reached by ASEAN countries have been fostered and reflect their different educational attainment. Graph 9 reports for all ASEAN countries, with the exception of Brunei[37], the percentage of men and women in the age group 15-44 with at least secondary education[38]. The ranking is lead by Singapore followed by Malaysia and Philippines. Intermediate positions are occupied by Indonesia and Thailand. At the bottom of the ranking we find Myanmar, Laos, Cambodia and Vietnam[39].

Graph 9 - ASEAN countries; men and women (15-44) with at least secondary education; percentage values; 2007



	Singapore	Malaysia	Philippines	Indonesia	Thailand	Myanmar	Laos	Cambodia	Vietnam
Men	91	85	73	66	56	50	44	41	40
Women	90	85	80	61	54	47	32	25	39

Source – IIASA 2008

Men register higher values in all countries with the only notable exception of Philippines where women percentage is 7 points higher than that of men. In Singapore, Malaysia, Thailand, Myanmar, and Vietnam the gender differential is absent or extremely low. A gender differential equal or higher than 5 percentage points is registered by Indonesia, Laos and Cambodia.

In order to better evaluate the knowledge structure of each country and the different options it opens for the future, it is important to consider separately the percentages of men and women with secondary and tertiary education (Graphs 10 and 11).

The two rankings suggest that Singapore[40] and Philippines (and in some measure also Laos) have been specializing in tertiary education, while Malaysia and Indonesia have directed their efforts mainly toward secondary

[37] The source we have used (IIASA) does not provide data for Brunei and similar data are not available at the national level.

[38] More data for men and women, in 1970 and 2007, together with mean number of year of study is reported in table 10 of the Statistical Annex.

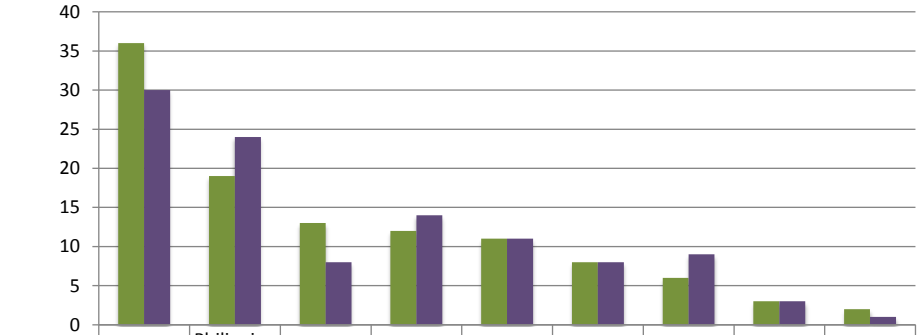
[39] The ranking of Vietnam is penalized by its gender unbiased approach to education. Laos and Cambodia are in fact characterized by a slight higher percentage of men, but by a much lower percentage of women with at least secondary education.

[40] To better evaluate the attainment of Singapore we recall that in Korea and Japan the percentages of men with tertiary education are 39 and 42 per cent.

education. Thailand and Myanmar are slightly behind, but seem to be proceeding in a balanced way, while Cambodia and Vietnam are still characterized by a heavy delay particularly relevant for tertiary education.

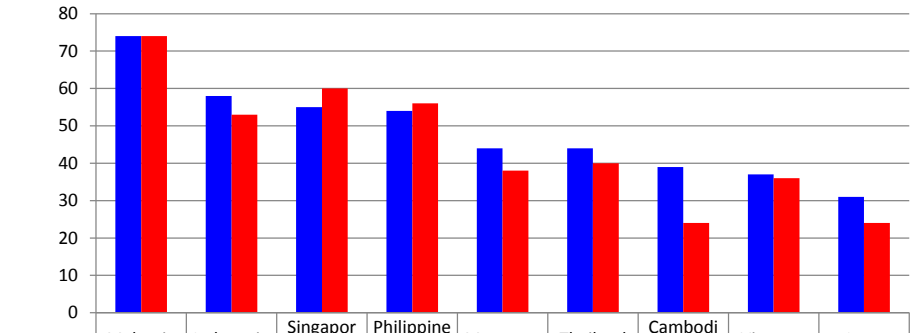
In conclusion, these data suggest that in Cambodia, Laos, and Vietnam the Labor force is still characterized by capabilities that provide options mainly in low and medium technology clusters, while Malaysia and also, although in a more limited way, Indonesia have already shifted or are ready to shift to higher technology cluster. The educational attainment of Singapore and Philippines suggests that tertiary activities are the best options for both countries that however are also equipped for high technology manufacturing clusters. Finally, Thailand and possibly Myanmar seem to have the option to operate in services and manufacturing sectors adopting intermediate technologies.

Graph 10 - ASEAN countries; men and women (15-44) with tertiary education; percentage values; 2007



	Singapore	Philippines	Laos	Thailand	Malaysia	Indonesia	Myanmar	Vietnam	Cambodia
Men	36	19	13	12	11	8	6	3	2
Women	30	24	8	14	11	8	9	3	1

Graph 11 - ASEAN countries; men and women (15-44) with secondary education; percentage values; 2007



	Malaysia	Indonesia	Singapore	Philippines	Myanmar	Thailand	Cambodia	Vietnam	Laos
Men	74	58	55	54	44	44	39	37	31
Women	74	53	60	56	38	40	24	36	24

Source – IIASA, 2008

Although not too recent, UNIDO data on competitiveness and on the share of medium-high tech value added in manufacturing give support to this analysis (Table 16). Singapore (that is world leader in competiveness) has by far the largest share of high technology products, followed in both ranking by Malaysia. The next two countries are Philippines and Thailand, followed by Indonesia. It is of interest to observe that these ranking correspond to the ranking by educational attainment.

Table 16 - ASEAN countries; Competitive Industrial Performance Index and Share of medium-high tech Value Added in manufacturing; 2007

Country	Competitive industrial Performance Index	World ranking	Country	Share of medium-high tech Value Added in Manufacturing
Singapore	0.895	1	Singapore	77.58
Malaysia	0.474	19	Malaysia	49.85
Thailand	0.407	28	Philippines	40.09
Philippines	0.400	32	Thailand	37.84
Indonesia	0.264	47	Indonesia	29.79
Viet Nam	0.193	72	Viet Nam	21.86
Cambodia	0.155	90	Cambodia	0.26
Source - UNIDO				

A final element to complete the picture of educational attainment and its future evolution is offered by public expenditure on education and its distribution by educational level (table 17). Malaysia is the country that at present devotes it largest share of GDP to education, followed by Vietnam, both countries boasting a percentage above 5 per cent. With percentages between 4 and 5 we find Indonesia and Thailand, the only two ASEAN countries that devote more than 1/5 of government expenditures to education.

To appreciate the countries' perception of their educational needs we can also observe that Cambodia, whose primary schools are affected by a very high dropout rate, are giving high priority to this educational level. A similar balanced vision of an education structure progressively built from the bottom, seems to be followed also by Indonesia and Philippine. Brunei and Malaysia are now concentrating their effort primarily on secondary education, while Singapore continues its efforts to create a highly educated work force.

Table 17 - ASEAN countries; Public expenditure on education and distribution by educational level; 2007

	Public expenditure on education as % of		Percentage of Public Expenditure by Educational Level				
	GDP	Gov. Expend.	Pre-primary	Primary	Secondary	Tetiary	Unknown
Malaysia	5.8	18.9	1	35	46	18	
Viet Nam	5.3	19.8	5	38	26	22	9
Indonesia	4.6	26.0	1	57	32		10
Thailand	4.1	20.8	7	48	16	17	13
Laos	3.3	13.2	3	46			51
Singapore	3.1	11.6	0	20	33	36	11
Philippines	2.7	16.9	2	52	27	10	10
Cambodia	2.6	12.4	1	73	21	5	
Brunei Darussalam	2.1	13.7	0	29	47	24	
Myanmar	1.3	18.1	0	48	40	12	
Source - IIASA							

10 SUMMARY AND POLICY SUGGESTIONE

10.1 The main conclusions

In the first part of the paper we have shown that the demographic revolution has already been affecting all ASEAN countries for a considerable period of time. The different intensity of economic growth, historical circumstances, prevailing values and customs have, however, interacted with demographic trends so that each country is at a different stage of this complex process. From our perspective the most interesting element is that Singapore, Thailand, Malaysia and Brunei have already been characterized by a relevant lack of labor supply that has provoked -and has been compensated by- the arrival of at least 10 million migrants, many of them from other ASEAN countries. At the same time, other migrants have left ASEAN countries, mainly Indonesia and Philippines, for non-ASEAN arrival countries.

We have also argued that in ASEAN arrival countries the need of foreign labor will progressively increase. This will depend both on the supply and on the demand side of the labor market. In the first place, the supply of local labor will necessarily decline for at least thirty, forty years. This will be caused by the decline in WAP brought about, on one hand, by the contraction in generational entries and, on the other, by the increase in generational exits. Both trends are unavoidable, being generated by structural phenomena, respectively the decline in fertility and ageing[41]. The exact dimension of the manpower needs and of the amount of migrants will, however, depend on the rate of growth of GDP that each economy will register and on the development path they will choose, which will determine the employment-income elasticity.

[41] The young people that will enter the Labor force in the next 20 years are already born and not big changes in the number of births can be forecasted in the next 10-15 years. The age structure of the Labor force is known and therefore generational exits from the labor market can also be easily estimated.

Finally, we have shown that in Singapore, Thailand and Malaysia the structural lack of labor supply:

- In the short run, cannot be counterbalanced by absorbing unemployment or increasing labor market participation, since unemployment is very low and participation very high or not expandable for cultural reasons;
- In the long run, it cannot be dealt with by delocalizing production and/or by increasing productivity, given the size and the expected duration of the phenomenon.

On the basis of the previous line of reasoning we have proposed and estimated labor market and demographic scenarios in which the migration flows and the demographic evolution of the arrival countries depend on their manpower needs. The results project a demographic future very different from that proposed by the Population Division, whose estimates appear to be more sensitive to the political stance of the interested countries than to economic logic.

The main conclusion is rather straightforward: the higher the rate of economic growth that will be attained by Singapore, Thailand, Malaysia, and Brunei, the higher their need of foreign labor, not only in absolute terms, but also as a percentage of the labor demand in terms of flow. [42] Our model shows that in a very near future the local supply of labor will not be sufficient even to offset Replacement demand. In substance, the paper supports the idea that growing workers mobility within the ASEAN community will represent an unavoidable precondition for economic growth and social development.

In the following section of the paper, a survey of the relevant literature has brought us to support the idea that economic growth is the result of a process of technological upgrading, of diversification and structural change driven by the accumulation of capabilities, on one hand, and the transformation of the production structure, on the other. In substance, according to this perspective, it is the knowledge base of a country that defines and limits the technologies a country can adopt, the production structure it may evolve, and therefore the possible paths to economic growth and social development. More specifically, speeding up economic growth and triggering successful catching up processes does require shifting production from low quality activities into "high quality activities", in other words to *jump* into new knowledge clusters. In order to do so a country needs to drive its knowledge structure toward higher diversity and complexity; in other words to endow its incoming labor force with the expertise and competences that will be required by the economic development triggered by industrial policies, and this in coordination with the necessary industrial policies.

Finally the paper has provided some information on the educational attainment of the younger components of WAP in each ASEAN country. Data show that, also in this case, ASEAN presents a very articulated reality,

[42] The labor demand in terms of flow is measured by the new entries in the labor market necessary i) to substitute the people that leave the Labor force for good and ii) to occupy the additional jobs generated by economic growth

but also a remarkable coherence between, on one hand, the educational attainment structure and, on the other, the level of development as well as the structure of the industrial and service sectors. The percentage of people between 15-44 with secondary and tertiary education spans between the maximum of Singapore (around 90 per cent) and the minimum values that characterize Laos, Cambodia, and Vietnam (between 40 and 45 per cent). Coherently, while Singapore has the world highest ranking in Industrial performance, Malaysia and Indonesia have already shifted their production structure to high quality activities and new knowledge cluster, or are ready to do so. On the other end, Cambodia and Vietnam are still attracting foreign investments mainly in labor intensive, low technology sectors.

In conclusion, the paper contends that, in a very near future, workers mobility within ASEAN will not be a choice, but a necessity imposed by demographic tendencies and economic growth. The pace of economic growth and the typology of development will determine the amount of Labor force that will be needed and the competencies and skills requested by the arrival countries. At the same time, the other ASEAN countries will have a structural excess of labor supply that will not be able to find a productive occupation in the national markets because the rate of growth requested to absorb it will remain out of reach.

It could be ASEAN goal to transform these weaknesses into strong points.

10.2 Some policy suggestions

The structural lack of labor supply that will affect Singapore, Thailand and, in a lesser measure, Malaysia can be faced only in two ways: migration and delocalization of production. The second approach, although viable from an economic perspective, can provide only a very partial solution to the expansion of production, given its risks and serious political drawbacks.

A correct migration policy can be based only upon a serious evaluation of the amount and typology of workers needed by the arrival countries[43]. It must be underlined that the more economically and socially developed economies do not need *only* skilled labor, but on the contrary - especially at the beginning of the migration process- they need *mainly* unskilled labor. The reason is quite obvious. As income per-capita increases, families will tend to provide more education to their children. The result is that the young generations that will enter the labor market in the near future in the most developed areas of ASEAN will not be willing to accept low-paid menial jobs, which remain abundant also in developed economies, especially in the service sectors. However, with time, the percentage of qualified workers and university graduates needed by these economies will progressively grow, as the percentage of migrants requested in order to face local labor demand will increase[44].

[43] Another extremely important element will be represented by a system of recognition of skill certificates and credentials within and among countries in the ASEAN region.
[44] For Singapore, see Brenda S.A. Yeoh, 2007

The other side of the coin is that migrations have both positive and negative impacts on the socio-economic systems of departure countries. On one hand, it can reduce the pressure on the supply side of the labor market and provide remittances that could, if properly directed, support productive investments. On the other hand, migration depletes the knowledge structure and the capabilities of departure countries because migrants are by definition the most dynamic elements of their societies.

As it has already been suggested, a correct approach to economic growth and catching up requires that educational policies and industrial policies be called to play a fundamental role. At national level, this implies that education and training policies should have both a short-run and a long-run objective: 1) in the short-run, provide a correct response to the local labor demand in terms of skills; 2) in the long-run, endow the incoming generations with the knowledge and the skills necessary to move the national production structure toward higher quality products. In order to avoid unemployment and frustrations, this second objective does however need a coordinated set of industrial policies that will create the demand for graduates with higher skills. In substance, education and vocational training policies should prepare the people for the production structure that is going to be promoted by industrial policies.

At ASEAN level the implication is that the educational policies of the departures countries should be coordinated also with the industrial policies of the arrival countries so that the unavoidable structural excess of labor of departures countries will find productive employment or in the arrival countries or in their investment in departures countries. These coordinated efforts will progressively lead toward a common market of the factors of production[45].

A basic element for designing and implementing the previous complex set of measures is information. Many ASEAN countries still lack the statistical information on demography, education, vocational training, labor market and migration[46] that represents the necessary prerequisite to design and implement the policies we have just outlined. Moreover, this information needs to be comparable and based upon best international practices.

This suggests that a fist important measure that could be implemented by ASEAN is the creation of an ASEAN Labor Market Information System[47]. As shown in Figure 2, a LMIS can be thought as:

- A network of producers and consumers of Labor Market Information
- A store of Labor Market Information

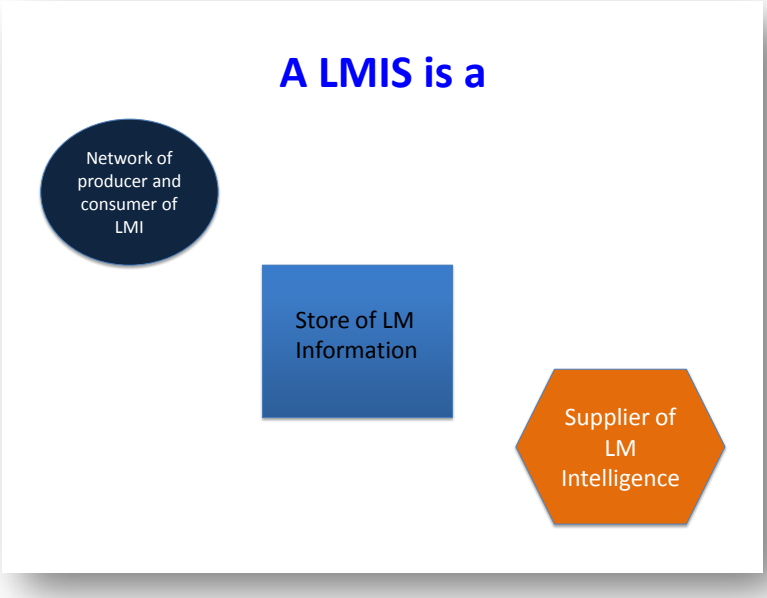
[45] Already the "**ASEAN Labor Ministers' Work Program 2000 to 2005"** stated that ASEAN countries need to enhance capacity for formulating and implementing a comprehensive and integrated human resource development (HRD) strategy on a continuous basis in order to adjust to global competition. This will include, among other things, a coordinated employment, manpower education and training programs, planning, labor policy measures and labor market information programs.

[46] The problem is fully recognized by the ALM last Work program that states: "Although human resource development planning and labor market information and analysis is a stated priority area for ASEAN, comprehensive information on the structure of ASEAN Member States' labor sectors remains of limited availability.

[47] The ASEAN LMIS would also respond to one of the priorities of the ALM work program, labor market monitoring.

- A supplier of Labor Market Intelligence

Figure 2



The first element put the accent on the fact that the ASEAN LMIS should be the expression of its stakeholders, i.e. the national producers and consumers of data. The former will provide the necessary statistical information and support their correct interpretation; the latter will indicate their needs and cooperate in directing the collection of data and the management of the system.

The second element indicates that the ASEAN LMIS should be the physical place where all the relevant national labor market information will be mapped, collected, evaluated, organized and stored.

Finally, the real justification of the ASEAN LMIS is that of providing a flow of structural and short-run analyses needed to design, implement and monitor the educational, industrial, and migration policies of ASEAN countries. Between the more relevant areas of analysis we can indicate:

- The education and vocational training systems of the ASEAN countries: in order to assess their structural characteristics and their evolution; estimate their production in terms of students outflows classified in regular and irregular, and by educational level;
- The transition process from the Educational and Vocational Training System, on one hand, and the Labor Market, on the other;
- The labor markets of the ASEAN countries in a comparative perspective;
- Internal and external migration flows.

In a more specific way the LMIS should provide the necessary inputs

- To design a framework of educational policies and industrial policies to be proposed to member countries for approval and implementation;
- To create and up-keep labor market and demographic scenarios of the type we have just shown;
- To design a map of the excess of labor supply in departures countries;
- To define the manpower needs of arrival countries, by occupations and skills.

In particular, the scenarios should provide estimates, over a 5-10 year sliding horizon, of the level and skill structure of the manpower needs of arrival countries, on one hand, and of the structural excess of labor supply of departures countries, on the other.

10.3 The Education Migration Fund

There is a final suggestion we deem relevant to advance on the eve of the creation of an integrated economic community that will progressively allow the free movement of capital and labor.

A migrant bring with him a "capital" of capabilities that is the result not only of its personal investment, but also of the public investments of its country of origin. In substance, the arrival of a migrant corresponds for the production system of the receiving country to the free acquisition of a factor of production. This is obviously true only if and when the migrant worker is needed, i.e. his services are essential and do not have a substitute in the arrival country. The paper has strongly argued that this situation will exist and persist for at last four ASEAN countries and for a number of workers largely in excess of those "forecasted" by international Institutions.

This aspect of migration has been largely overlooked by the literature because migrations are still predominantly explained from the supply side, migrants being seen as people running away from misery and deprivation, if unskilled and with low education, and as people in search of a higher income and better life, if educated and skilled. This brings to stress the cost that the countries of arrival have to bear or to promote ideas of brotherhood toward the migrants and their needs.

If we abandon this perspective to realistically accept that in an increasing number of countries labor internally produced is not sufficient to carry on and expand production, and therefore that these countries need to acquire labor from other countries in the same way as they need to acquire raw materials and capital goods, then it logically follows that arrival countries should pay for each migrant that is going to have a job position a price proportional to its education and skill level and at least equal to the cost the departure country has supported to educate and train him[48].

Keeping in mind that:

- Migrants represent a depletion of the knowledge base of the departures countries;

[48] This would also eliminate market distortion deriving from the free acquisition of factors of production by arrival countries.

- A more educated and better trained labor force is the key for economic growth;
- The need for foreign labor will dramatically increase at least for the next forty years;
- Population explosion will make more and more difficult if not impossible the development of the poorest countries in the world where the excess of labor supply will be progressively concentrated;

the creation and correct utilization of an Education Migration Fund could activate a relevant, correct, and equitable transfer of money from the rich to the poor countries to be invested in the most important factor of economic growth and social development: ***education***[49].

It is evident that even if accepted the implementation of this proposal would have to face a series of complicated issues that cannot be confronted in this paper. Here we can limit ourselves to a few suggestions.

In a global perspective we could envisage the constitution of an **Education Migration Fund** (EMF) with UNESCO that could be in charge to collect the payments from arrival countries and route them toward departure countries. This should be done in a fast and efficient way, and following a plan agreed upon with departure countries. The money should be directed to build new schools, improve the existing building, train the teachers, provide equal opportunities, and promote gender equality, in coordination with the industrial and macroeconomic policies required to start effective catching up processes.

ASEAN countries are committed to "enhance and improve the capacity of ASEAN human resources through strategic programs, and to develop a qualified competent and well-prepared ASEAN labor force that would benefit from as well as cope with the challenges of regional integration"[50]. It is evident that in the less developed countries the necessary improvement of the educational and vocational training system finds an upper limit in the existing, largely insufficient resources. The adoption of the previous proposal could provide a correct and equitable solution to this problem. Moreover it could be argued that in the growth perspective we have adopted, arrival countries would be a final beneficiary of the transfers because the same transfers would foster the process of catching up of the weaker economies, increase their level of per-capita income and therefore expand their market for foreign high quality products and services.

In this perspective ASEAN could represent an ideal testing ground of this measure. A specific working group of ASEAN experts could be entrusted with the development and implementation of the idea. Also in this case, the final goal would be the constitution of a EMF to which arrival

[49] What we propose is totally different from the so-called Bhagwati tax. In the first place, the argument advanced, almost 40 years ago by Bhagwaty and Dellafar (Bhagwati, Jagdish N., and Dellafar, 1973) calls for a tax on the incomes of "professional emigrants" from developing countries into developed countries. In the second place, the Bhagwati proposal refers only to the so called brain drain. Finally it is a typical expression of a supply side vision of the migration process. It can also be reminded that initially, also Bhagwati discussed methods for transferring income from developed countries to developing countries to compensate the latter for losses caused by the brain drain (Bhagwati and Hamada, 1974, 1975). For a more detailed discussion of the Bhagwati tax, see Wilson John Douglas, 2005

[50] ASEAN Socio-Cultural Community Blueprint

countries would transfer their payments that would then be directed toward the departure countries, in accordance with educational plans agreed upon by ASEAN and the individual countries and in coherence with the national and ASEAN training needs.

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Statistical Annex

Table A1 - Number of arrival and departure countries; emigration and immigration by continent and area; values in milion: 1950-60 and 2000-10

	N. countries	N. countries with positive migration balances	N. countries with negative migration balances	Positive migration balances	Negative migration balances	Net migration balance
	1950-1960					
Europe	40	13	26	3.0	-7.8	-4.9
New World countries	4	4		5.1		5.1
Asia	50	20	21	3.8	-2.2	1.6
South America and Carebbean	37	11	22	1.4	-1.9	-0.5
Africa	55	13	29	0.8	-2.1	-1.3
Oceania	10	1	7	0.0	0.0	0.0
Total	196	62	105	14.1	-14.1	0.0
Intercontinenatal flows, ab. value				6.7		
Intercontinenatal flows, %				47.7		
	2000-2010					
Europe	40	27	13	20.1	-1.8	18.3
New world countres	4	4	0	15.3		15.3
Asia	50	21	27	14.2	-30.6	-16.4
Gulf countries	*6*	*6*		*8.7*		
South America and Carebbean	37	8	28	0.4	-11.6	-11.2
Africa	55	16	36	3.9	-10.2	-6.3
Oceania	10	2	5	0.0	-0.2	-0.1
Total	196	78	109	53.9	-54.3	-0.4
Intercontinenatal flows, ab. value				33.7		
Intercontinenatal flows, %				62.4		

Source: our elaboration on data PD, 2011

Table. A2 -Migration balance of the first 25 arrival and departure countries; 2000-2010; thousand

Departure countries	Migration balance	Arrival countries	Migration balance
United States of America	11,150	India	-4,923
Spain	5,079	Mexico	-4,401
United Arab Emirates	3,857	Bangladesh	-4,401
Italy	3,853	China	-4,182
Saudi Arabia	2,781	Pakistan	-3,750
Russian Federation	2,700	Indonesia	-2,477
Canada	2,187	Philippines	-2,361
United Kingdom	1,989	Zimbabwe	-1,600
Australia	1,786	Myanmar	-1,500
Thailand	1,595	Peru	-1,350
South Africa	1,400	Morocco	-1,289
Germany	1,319	Uzbekistan	-1,274
France	1,266	Brazil	-1,000
Qatar	1,027	Côte d'Ivoire	-870
Singapore	954	Viet Nam	-863
Afghanistan	585	Iraq	-730
Burundi	570	Guinea	-725
Sierra Leone	560	Tajikistan	-718
Syrian Arab Republic	492	Egypt	-718
Malaysia	481	El Salvador	-647
Bahrain	473	United Republic of Tanzania	-645
Kuwait	439	Ethiopia	-640
Sweden	421	Somalia	-500
Belgium	396	Guatemala	-500
Austria	380	Republic of Moldova	-492
Total	47,741	Total	-42,558

Table. A3 - Asia; arrival and daparture countries; migration balance; 2000-2010; thousand			
Departure countries	Migration balance	Arrival countries	Migration balance
United Arab Emirates	3,857	India	-4,923
Saudi Arabia	2,781	Bangladesh	-4,401
Thailand	1,595	China	-4,182
Qatar	1,027	Pakistan	-3,750
Singapore	954	Indonesia	-2,477
Afghanistan	585	Philippines	-2,361
Syrian Arab Republic	492	Myanmar	-1,500
Malaysia	481	Uzbekistan	-1,274
Bahrain	473	Viet Nam	-863
Kuwait	439	Iraq	-730
Israel	377	Tajikistan	-718
Japan	322	Georgia	-459
China, Hong Kong SAR	165	Kyrgyzstan	-381
Jordan	109	Cambodia	-373
Azerbaijan	107	Sri Lanka	-350
Cyprus	106	Occupied Palestinian Territory	-280
Oman	103	Yemen	-235
China, Macao SAR	93	Kazakhstan	-214
Lebanon	88	Nepal	-200
Bhutan	52	Lao People's Democratic Republic	-190
Brunei Darussalam	7	Armenia	-175
Dem. People's Republic of Korea	0	Turkmenistan	-168
Maldives	0	Turkey	-150
Total	14,213	Republic of Korea	-128
PdG	8,681	Iran (Islamic Republic of)	-60
		Mongolia	-30
		Timor-Leste	-10
		Total	-30,583
Source: our elaboration on data PD, 2011			

Table A4 - Thailand - Labour market and demographic sceanarios 2010-35

	WAP		WAP change	Migr 5 year UNPD hypothesis)	WAP change - Migration	rate of participation	Change in LF	Rate of change in employment	Change in employment level	Employment	Total Manpower Needs (5 years)	Total Manpower Needs (yearly average)
		Scenario A										
2005	48942									35257		
2010	52856	2005-2010	3914	490	3424	72.7	2490	7.9	2780	38037	290	58
2015	55379	2010-2015	2,523	395	2,128		1,547	7.9	2,999	41,037	1,452	290
2020	57408	2015-2020	2,030	390	1,640		1,193	7.9	3,236	44,273	2,043	409
2025	58778	2020-2025	1,370	385	985		716	7.9	3,491	47,764	2,775	555
2030	59607	2025-2030	829	385	444		323	7.9	3,766	51,530	3,444	689
2035	59885	2030-2035	278	380	-102		-74	7.9	4,063	55,593	4,138	828
			7,029	1,935	5,094		3,705		17,556		13,851	554
									0.461549178		36.41538221	
	WAP		WAP change	Migr 5 year UNPD hypothesis)	WAP change - Migration Balance	rate of participation	Change in LF	Rate of change in employment over a 5 year period	Change in employment level	Employment	Total Manpower Needs (5 years)	Total Manpower Needs (yearly average)
		Scenario B										
2005	48942									35257		
2010	52856	2005-2010	3914	490	3424	72.7	2490	7.9	2780	38037	290	58
2015	55379	2010-2015	2523	395	2128		1547	7.3	2780	40818	1233	247
2020	57408	2015-2020	2030	390	1640		1193	6.8	2780	43598	1588	318
2025	58778	2020-2025	1370	385	985		716	6.4	2780	46378	2064	413
2030	59607	2025-2030	829	385	444		323	6.0	2780	49158	2457	491
2035	59885	2030-2035	278	380	-102		-74	5.7	2780	51938	2854	571
			7029	1935	5094		3705		13901		10196	408

Table A5 - Thailand; population by main age group and rate of employment in alternative scenarios of migration; 2010-2035													
Scenario A	0-14	15 +			Total population			Percentage of people 0-14			Rate of employment		
		B=1	B=1.15	B=1.30	B=1	B=1.15	B=1.30	B=1	B=1.15	B=1.30	B=1	B=1.15	B=1.30
2010	14,195	52,856	52,856	52,856	67,051	67,051	67,051	21.2	21.2	21.2	72.0	72.0	72.0
2015	13,326	56,436	56,973	57,510	69,762	70,299	70,836	19.1	19.0	18.8	72.7	72.0	71.4
2020	12,359	60,119	61,208	62,298	72,478	73,567	74,657	17.1	16.8	16.6	73.6	72.3	71.1
2025	11,592	63,879	65,532	67,185	75,471	77,124	78,777	15.4	15.0	14.7	74.8	72.9	71.1
2030	11,093	67,766	70,002	72,239	78,859	81,095	83,332	14.1	13.7	13.3	76.0	73.6	71.3
2035	10,831	71,801	74,643	77,485	82,632	85,474	88,316	13.1	12.7	12.3	77.4	74.5	71.7
Diff.	-3,364	18,945	21,787	24,629	15,581	18,423	21,265						
Scenario B													
2010	14,195	52,856	52,856	52,856	67,051	67,051	67,051	21.2	21.2	18.9	72.0	72.0	72.0
2015	13,326	56,216	56,720	57,225	69,542	70,046	70,551	19.2	19.0	18.9	72.6	72.0	71.3
2020	12,359	59,444	60,432	61,420	71,803	72,791	73,779	17.2	17.0	16.8	73.3	72.1	71.0
2025	11,592	62,493	63,938	65,384	74,085	75,530	76,976	15.6	15.3	15.1	74.2	72.5	70.9
2030	11,093	65,394	67,275	69,155	76,487	78,368	80,248	14.5	14.2	13.8	75.2	73.1	71.1
2035	10,831	68,146	70,440	72,733	78,977	81,271	83,564	13.7	13.3	13.0	76.2	73.7	71.4
Diff.	-3,364	15,290	17,584	19,877	11,926	14,220	16,513						

Table A6 - Singapore - Labour market and demographic sceanarios 2010-35

	WAP		WAP change	Migr 5 year UNPD hypothesis)	WAP change - Migration Balance	rate of participation	Change in LF	Rate of change in employment over a 5 year period	Change empl	Employment	Total Manpower Needs (5 years)	Total Manpower Needs (yearly average)
		Scenario A										
2005	3426		353	230	123							
2010	4196	2005-2010	770	720	50	74.7	37.3		781	3047	743.2	
2015	4582	2010-2015	386	175	211		158	22.7	693	3740	535	107
2020	4817	2015-2020	235	125	110		82	22.7	850	4590	768	154
2025	4965	2020-2025	148	125	23		17	22.7	1043	5634	1026	205
2030	5097	2025-2030	132	120	12		9	22.7	1281	6914	1272	254
2035	5197	2030-2035	100	120	-20		-15	22.7	1572	8486	1587	317
			1001	665	336		251		5439		5188	208

	WAP		WAP change	Migr 5 year UNPD hypothesis)	WAP change - Migration	rate of participation	Change in LF	Rate of change in employment over a 5 year	Change empl	Employment	Total Manpower Needs (5	Total Manpower Needs (yearly
		Scenario B										
2005	3426		353	230	123							
2010	4196	2005-2010	770	720	50	74.7	37.3		781	3047	743.2	
2015	4582	2010-2015	386	175	211		158	25.6	781	3828	623	125
2020	4817	2015-2020	235	125	110		82	20.4	781	4608	698	140
2025	4965	2020-2025	148	125	23		17	16.9	781	5389	763	153
2030	5097	2025-2030	132	120	12		9	14.5	781	6169	772	154
2035	5197	2030-2035	100	120	-20		-15	12.7	781	6950	795	159
			1001	665	336		251		3903		3652	146

	WAP		WAP change	Migr 5 year UNPD hypothesis)	WAP change - Migration	rate of participation	Change in LF	Rate of change in employment over a 5 year	Change empl	Employment	Total Manpower Needs (5	Total Manpower Needs (yearly
		Scenario C										
2005	3426		353	230	123							
2010	4196	2005-2010	770	720	50	74.7	37.3		781	3047	743.2	
2015	4582	2010-2015	386	175	211		158	22.7	693	3740	535	107
2020	4817	2015-2020	235	125	110		82	11.4	425	4165	343	69
2025	4965	2020-2025	148	125	23		17	5.7	237	4402	220	44
2030	5097	2025-2030	132	120	12		9	2.8	125	4527	116	23
2035	5197	2030-2035	100	120	-20		-15	1.4	64	4591	79	16
			1001	665	336		251		1544		1293	52

Table A7 - Singapore; population by main age group and rate of employment in alternative scenarios of migration; 2010-2035													
Scenario A	0-14	15 +			Total population			Percentage of people 0-14			Rate of employment		
		B=1	B=1.15	B=1.30	B=1	B=1.15	B=1.30	B=1	B=1.15	B=1.30	B=1	B=1.15	B=1.30
2010	884	4,196	4,196	4,196	5,080	5,080	5,080	17.4	17.4	17.4	72.6	72.6	72.6
2015	783	4,942	5,054	5,166	5,725	5,837	5,949	13.7	13.4	13.2	75.7	74.0	72.4
2020	772	5,820	6,064	6,307	6,592	6,836	7,079	11.7	11.3	10.9	78.9	75.7	72.8
2025	821	6,869	7,270	7,671	7,690	8,091	8,492	10.7	10.1	9.7	82.0	77.5	73.4
2030	866	8,153	8,747	9,340	9,019	9,613	10,206	9.6	9.0	8.5	84.8	79.0	74.0
2035	886	9,720	10,548	11,377	10,606	11,434	12,263	8.4	7.7	7.2	87.3	80.4	74.6
Diff.	2	5,524	6,352	7,181	5,526	6,354	7,183						
Scenario B													
2010	884	4,196	4,196	4,196	5,080	5,080	5,080	17.4	17.4	12.9	72.6	72.6	72.6
2015	783	5,030	5,155	5,280	5,813	5,938	6,063	13.5	13.2	12.9	76.1	74.3	72.5
2020	772	5,838	6,085	6,331	6,610	6,857	7,103	11.7	11.3	10.9	78.9	75.7	72.8
2025	821	6,625	6,989	7,353	7,446	7,810	8,174	11.0	10.5	10.0	81.3	77.1	73.3
2030	866	7,408	7,890	8,372	8,274	8,756	9,238	10.5	9.9	9.4	83.3	78.2	73.7
2035	886	8,184	8,782	9,380	9,070	9,668	10,266	9.8	9.2	8.6	84.9	79.1	74.1
Diff.	2	3,988	4,586	5,184	3,990	4,588	5,186						
Scenario C													
2010	884	4,196	4,196	4,196	5,080	5,080	5,080	17.4	17.4	13.2	72.6	72.6	72.6
2015	783	4,942	5,054	5,166	5,725	5,837	5,949	13.7	13.4	13.2	75.7	74.0	72.4
2020	772	5,395	5,575	5,755	6,167	6,347	6,527	12.5	12.2	11.8	77.2	74.7	72.4
2025	821	5,638	5,854	6,070	6,459	6,675	6,891	12.7	12.3	11.9	78.1	75.2	72.5
2030	866	5,766	6,001	6,237	6,632	6,867	7,103	13.1	12.6	12.2	78.5	75.4	72.6
2035	886	5,825	6,069	6,314	6,711	6,955	7,200	13.2	12.7	12.3	78.8	75.6	72.7
Diff.	2	1,629	1,873	2,118	1,631	1,875	2,120						

Table A8 - Malaysia - Labour market and demographic sceanarios 2010-35

	WAP		WAP change	Migr 5 year UNPD hypothesis)	WAP change - Migration Balance	rate of participation	Change in LF	Rate of change in employment over a 5 year period	Change empl	Employment	Total Manpower Needs (5 years)	Total Manpower Needs (yearly average)
2000	14612	**Scenario A**										
2005	16451		1839	395	1444	63.3	857		776.2	10045	-81	-16
2010	18369	2005-2010	1918	85	1833	62.7	1103.8	10.8	1084	11129	-19.8	-4
2015	20438	2010-2015	2070	85	1985		1244	10.8	1201	12330	-43	-9
2020	22537	2015-2020	2098	85	2013		1262	10.8	1331	13661	68	14
2025	24402	2020-2025	1865	85	1780		1116	10.8	1474	15135	358	72
2030	26200	2025-2030	1798	85	1713		1074	10.8	1633	16768	559	112
2035	27914	2030-2035	1714	85	1629		1022	10.8	1809	18578	788	158
			9545	425	9120		5718		7448		1730	326
									66.9254611			

Malaysia

Scenario contant employmnt growth = value last 5 years

	WAP		WAP change	Migr 5 year UNPD hypothesis)	WAP change - Migration Balance	rate of participation	Change in LF	Rate of change in employment over a 5 year period	Change empl	Employment	Total Manpower Needs (5 years)	Total Manpower Needs (yearly average)
		Scenario B										
2005	16451		1839	395	1444	63.3	857		776	10045	-81	-16
2010	18369	2005-2010	1918	85	1833	62.7	1103.8	10.8	1084	11129	-19.8	-4
2015	20438	2010-2015	2070	85	1985		1244	9.7	1084	12233	-160	-32
2020	22537	2015-2020	2098	85	2013		1262	8.9	1084	13337	-178	-36
2025	24402	2020-2025	1865	85	1780		1116	8.1	1084	14441	-32	-6
2030	26200	2025-2030	1798	85	1713		1074	7.5	1084	15545	10	2
2035	27914	2030-2035	1714	85	1629		1022	7.0	1084	16648	62	12
			9545	425	9120		5718		5420		-399	-80

Table A9 - Malaysia; population by main age group and rate of employment in alternative scenarios of migration; 2010-2035													
Scenario A	0-14	15 +			Total population			Percentage of people 0-14			Rate of employment		
		B=1	B=1.15	B=1.30	B=1	B=1.15	B=1.30	B=1	B=1.15	B=1.30	B=1	B=1.15	B=1.30
2010	8,617	18,369	18,369	18,369	26,986	26,986	26,986	31.9	31.9	31.9	60.6	60.6	60.6
2015	8,671	20,310	20,601	20,892	28,981	29,272	29,563	29.9	29.6	29.3	60.7	59.9	59.0
2020	8,674	22,392	22,995	23,598	31,066	31,669	32,272	27.9	27.4	26.9	61.0	59.4	57.9
2025	8,848	24,530	25,454	26,378	33,378	34,302	35,226	26.5	25.8	25.1	61.7	59.5	57.4
2030	8,971	26,802	28,067	29,332	35,773	37,038	38,303	25.1	24.2	23.4	62.6	59.7	57.2
2035	9,006	29,219	30,847	32,474	38,225	39,853	41,480	23.6	22.6	21.7	63.6	60.2	57.2
Diff.	389	10,850	12,478	14,105	11,239	12,867	14,494						
Scenario B													
2010	8,617	18,369	18,369	18,369	26,986	26,986	26,986	31.9	31.9	31.9	60.6	60.6	60.6
2015	8,671	20,193	20,467	20,740	28,864	29,138	29,411	30.0	29.8	29.5	60.6	59.8	59.0
2020	8,674	22,028	22,577	23,126	30,702	31,251	31,800	28.3	27.8	27.3	60.5	59.1	57.7
2025	8,848	23,776	24,587	25,398	32,624	33,435	34,246	27.1	26.5	25.8	60.7	58.7	56.9
2030	8,971	25,499	26,568	27,638	34,470	35,539	36,609	26.0	25.2	24.5	61.0	58.5	56.2
2035	9,006	27,191	28,514	29,837	36,197	37,520	38,843	24.9	24.0	23.2	61.2	58.4	55.8
Diff.	389	8,822	10,145	11,468	9,211	10,534	11,857						

Table A10 - ASEAN countries; Men and women aged 25-44; educational attainment by sex; 2007											
		Women aged 25-44					Men aged 25-44				
		No education	Primary	Secondary	Tertiary	Mean year of schooling	No education	Primary	Secondary	Tertiary	Mean year of schooling
Cambodia	1970	66	30	3	0	1.7	25	57	18	0	4.5
	2007	20	55	24	1	5	11	47	39	2	6.4
	Diff	*-46*	*25*	*21*	*1*	*3.3*	*-14*	*-10*	*21*	*2*	*1.9*
Indonesia	1970	42	38	20	0	3.9	18	51	29	2	5.6
	2007	2	37	53	8	8.6	1	33	58	8	8.9
	Diff	*-40*	*-1*	*33*	*8*	*4.7*	*-17*	*-18*	*29*	*6*	*3.3*
Laos	1970	75	23	1	0	1.2	36	48	15	2	4
	2007	28	40	24	8	5.4	15	41	31	13	7.1
	Diff	*-47*	*17*	*23*	*8*	*4.2*	*-21*	*-7*	*16*	*11*	*3.1*
Malaysia	1970	39	30	30	1	4.8	19	38	40	2	6.5
	2007	4	11	74	11	10.5	3	12	74	11	10.5
	Diff	*-35*	*-19*	*44*	*10*	*5.7*	*-16*	*-26*	*34*	*9*	*4*
Myanmar	1970	39	44	16	1	3.3	20	53	26	1	4.7
	2007	14	39	38	9	6.6	9	40	44	6	6.9
	Diff	*-25*	*-5*	*22*	*8*	*3.3*	*-11*	*-13*	*18*	*5*	*2.2*
Philippines	1970	7	50	37	7	6.8	6	49	39	6	6.9
	2007	1	19	56	24	10	2	25	54	19	9.3
	Diff	*-6*	*-31*	*19*	*17*	*3.2*	*-4*	*-24*	*15*	*13*	*2.4*
Singapore	1970	47	12	39	2	4.5	30	15	50	5	6.2
	2007	4	6	60	30	10.5	3	6	55	36	10.8
	Diff	*-43*	*-6*	*21*	*28*	*6*	*-27*	*-9*	*5*	*31*	*4.6*
Thailand	1970	23	55	21	1	5.5	15	58	25	2	6.3
	2007	4	42	40	14	9.1	3	41	44	12	9.1
	Diff	*-19*	*-13*	*19*	*13*	*3.6*	*-12*	*-17*	*19*	*10*	*2.8*
Vietnam	1970	24	61	14	0	3.8	8	65	25	2	5.5
	2007	5	56	36	3	6.4	5	54	37	3	6.5
	Diff	*-19*	*-5*	*22*	*3*	*2.6*	*-3*	*-11*	*12*	*1*	*1*
China	1970	39	32	29	1	4.5	15	39	44	2	6.7
	2007	3	23	69	5	8.6	1	16	76	7	9.3
	Diff	*-36*	*-9*	*40*	*4*	*4.1*	*-14*	*-23*	*32*	*5*	*2.6*
Japan	1970		34	60	6	8.9		32	55	13	9.4
	2007		5	50	45	13.1		7	51	42	12.8
	Diff		*-29*	*-10*	*39*	*4.2*	*0*	*-25*	*-4*	*29*	*3.4*
Korea	1970	20	36	42	2	6.3	7	26	59	7	8.7
	2007	0	3	65	32	12.4	0	3	58	39	12.9
	Diff	*-20*	*-33*	*23*	*30*	*6.1*	*-7*	*-23*	*-1*	*32*	*4.2*
Source: International Institute for Applied System Analysis; Asian and Human Capital Data, Data sheet, 2008											

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