

# On the PRC's Future Labor Strategy and East Asian Regional Integration\*

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Received February 24<sup>th</sup>, 2013; revised March 29<sup>th</sup>, 2013; accepted April 8<sup>th</sup>, 2013

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In this paper, pressures of population and labor shortage to be faced by the People's Republic of China (PRC) will be analyzed based on the situation of East Asia economic integration. A solution with new opinions about the PRC's labor and population strategies is proposed accordingly. Meanwhile, considering the situation of labor shortage and the degrading of population quality in the PRC, a strategic policy plan is suggested to restructure the PRC's labor forces in short, medium, and long terms.

*Keywords:* East Asian Integration; China's Population; Labor Strategy

## Labor Shortage in the PRC

### The Pressure Is Caused Mainly by Population Aging

#### Historical Analysis: The Interconnection of Economic and Labor Cycles

The present authors believe that changes in labor data can stably reflect social changes. As an example, a declining trend is observed in labor forces in the People's Republic of China (PRC) when population becomes advanced in age and the aged population clearly increasing. Therefore, in this paper, population, labor forces and their skilled level are used as the main parameters.

Since 1949, PRC's population has been expanding through a long period. Up to 1973, the annual average growth rate was 20%. In certain years the rate was as high as up to 35%, which was due to the birth promotion policy then and certain political consideration (Sanders, 2009). The population born in 1949-1973 (i.e. the high growth period) entered the labor market in the 1990s when economic cycle in up-turn. The abundance of labor facilitated PRC's economic growth and the open policy further accelerated economic growth in the PRC.

#### Population Bonus Cycle and Aging Period—The PRC's Future Social Pressure

It could be simply calculated that after 1949 Chinese population entered a high growth period. However, by 2009, the population naturally born since 1949 entered their old age eventually. By 1973, population growth in the PRC came to a halt. As a result, the last lot of the population shall become aged by 2033. According to Mr. Zeng Yi, the PRC's population bonus period started by the year of 1990, and the overall dependency ratio would return to 50% by 2030, which would mark the termination of the bonus period (Zeng Yi, 2005).

From **Table 1**, it could be estimated that in the PRC in the future, steady decrease and increase can be observed respectively among the labor population aged 19 - 59 and those aged 60 or older. And an annual expansion can be expected in the 0 - 14 age-band in long term due to the birth-control policy. Further, an annual growth of social supporting funds for the aged population could also be found to occur. The population equilibrium model is established as:

$$\frac{y}{p} + \frac{l}{p} + \frac{(o_{60+} + o_{80+})}{p} \times 100\% = 1$$

*y*: 0 - 14 age-band,

*l*: 15 - 59 age-band of labor population,

*o*: Aged population each year,

*p*: Total population.

### The Dilemma—Labor Supply Falls behind Economic Development

**Table 1** shows that in the PRC, children of 0 - 14 years of age will fall by 45.88% and the labor population will fall by 26.12% in 100 years. If the industries remained labor intensive, the PRC would have to face a dilemma, namely Labor supply shortage.

In recent years, there already have been obvious labor shortages in the PRC. The "Farmer Migrator shortage" has caused urban labor shortages in the context where the PRC's urbanization is expanding. And more labor population will return to villages, when, on the one hand, high salary in cities is no longer there for them and on the other hand, the life in rural areas becomes better and better. The PRC's economy still requires a lot of cheap labor.

According to calculations based on 2010 census data, rural population in the PRC has reached 662.8 million. **Table 2** indicates that, only 34.97 million left home for employment in

\*Short paper.

**Table 1.**  
Forecast on the PRC's population development trend.

Year	Population (100 million)							Proportion (%)	
	Overall Population	60+	65+	0 - 14	15 - 59	60+	80+/60+	Child Dependency Ratio (%)	Elderly Dependency Ratio (%)
2000	12.67	1.30	0.88	24.31	10.27	9.23	37.16	15.70	52.86
2010	13.62	1.66	1.09	19.89	12.20	10.91	29.29	17.96	47.25
2020	14.55	2.33	1.62	20.06	16.60	10.80	31.40	25.14	56.53
2030	15.00	3.40	2.28	18.04	22.69	10.87	30.44	38.29	68.53
2040	15.06	3.92	3.08	16.50	26.02	14.47	28.70	45.26	73.96
2050	14.82	4.35	3.22	16.27	29.32	21.25	29.91	53.89	83.80
2060	14.29	4.18	3.40	15.34	29.26	22.70	27.68	52.82	80.50
2070	13.70	4.09	3.25	14.90	29.88	27.52	26.99	54.12	81.11
2080	13.08	4.18	3.28	14.80	31.99	23.95	27.81	60.12	87.93
2090	12.49	4.14	3.36	14.29	31.18	25.31	27.20	63.15	90.36
2100	11.81	4.01	3.23	14.12	33.93	28.87	27.17	65.32	92.49

Note: Policy Studies on the PRC's Aging Population and Industrial Development, Xie Jianhua 2003 (Xie Jiahua, 2003).

**Table 2.**  
The PRC's rural population living in towns and cities.

Unit: People												
Household Registration												
Age	Total			Within Province						Outside Province		
				Inside Province			City Areas Residents Unregistered			Total	Male	Female
	Total	Male	Female	Total	Male	Female	Total	Male	Female			
Total	34973139	18636371	16336768	20686276	10448670	10237606	1275587	693115	582472	14286863	8187701	6099162
0 - 4	1197077	647369	549708	726849	389426	337423	48710	26203	22507	470228	257943	212285
5 - 9	1233475	668116	565359	797491	423549	373942	51543	27686	23857	435984	244567	191417
10 - 14	1149197	615295	533902	786946	413351	373595	50706	27403	23303	362251	201944	160307
15 - 19	2927959	1467542	1460417	1902132	917740	984392	125454	61981	63473	1025827	549802	476025
20 - 24	5626492	2500284	3126208	3188512	1208988	1979524	162772	77046	85726	2437980	1291296	1146684
25 - 29	4244282	1962971	2281311	2351339	919753	1431586	97800	42853	54947	1892943	1043218	849725
30 - 34	3711218	1918847	1792371	1989772	931708	1058064	92673	45964	46709	1721446	987139	734307
35 - 39	4031569	2235384	1796185	2036186	1067983	968203	88735	46466	42269	1995383	1167401	827982
40 - 44	3640565	2093626	1546939	1850614	1029528	821086	80523	43190	37333	1789951	1064098	725853
45 - 49	2434827	1475033	959794	1375442	807770	567672	78567	43423	35144	1059385	667263	392122
50 - 54	1364054	861999	502055	915005	556763	358242	73376	41258	32118	449049	305236	143813
55 - 59	1195857	758931	436926	885817	553304	332513	88797	53825	34972	310040	205627	104413
60 - 64	862285	570302	291983	712650	475204	237446	84592	56940	27652	149635	95098	54537
65 - 69	547449	362528	184921	468712	315530	153182	57942	39846	18096	78737	46998	31739
70 - 74	385011	249982	135029	333275	220203	113072	42506	28253	14253	51736	29779	21957
75 - 79	231961	143987	87974	201908	127223	74685	27607	17704	9903	30053	16764	13289
80 - 84	120740	69943	50797	105288	61800	43488	14780	8899	5881	15452	8143	7309
85 - 89	48181	24427	23754	41634	21298	20336	6115	3152	2963	6547	3129	3418
90 - 94	15276	7040	8236	12573	5693	6880	1875	812	1063	2703	1347	1356
95 - 99	5252	2619	2633	3813	1754	2059	480	203	277	1439	865	574
100+	412	146	266	318	102	216	34	8	26	94	44	50

Note: China State Statistics Dept, China's Population in 2010.

towns and cities. These people will potentially become part of the urban population. And 78.23% of the total rural population in working age have become an important source of labor supply in the PRC's economic development. In the above analysis, no potential trend of urbanization can currently be observed among about 630 million rural population in the PRC.

**Table 3** shows the industrial employment data in late 2010 when secondary industry in the PRC could still claim 41.88% of the country's employed persons. These persons were distributed mainly in labor-intensive sectors such as mining, manufacturing, construction, but they did not include workers engaged in farming, forestry, animal husbandry, and fishery. **Table 4** shows the value added for above three industries, accounting 44.24% of the total added value in the PRC. So it is impossible to change the lower value-added industrial structure within a short period.

Labor shortages may bring recession to those pillar industries—such as mining, manufacturing, and construction industries—that produce nearly half of the total added value. Then in the near future, these industries will have to raise wages to attract workers and, as a result, step further into depression. So why don't we take advantages of the Asian regional economic integration to import cheap labors from other countries?

There is public argument that the PRC should allow families to have second child. The statistics data (Bao Chengzhong, 2012) shows that, currently undergraduates accounted for only 4.01% of the Chinese population. The PRC's illiterate popula-

tion accounted for 33.75% of the total [4]. Once the second child policy were implemented, The PRC's population quality would become more uncontrollable, and economic burden would be heavier.

## Labor Supply from the Asian Economic Integration

### The East Asian Economic Integration

Currently regionalization and globalization is well under way in the world, as exemplified by the EU, the NAFTA, the ASEAN and many global and regional organizations. Among them, the UN (the United Nations) ranks the largest.

East Asian integration has gone through a long process. As early as in the 1950s, there was the idea of "Pacific Economic Community". In 1990, Mahathir Mohammad, former Malaysian Prime Minister proposed the establishment of "East Asian Economic Group" (Xu Ruilong, 2007).

Although issues regarding the liberalization of trade in services (LTS henceforth) were put on the agenda in 1995, i.e. the AFAS (ASEAN Framework Agreement on Services), the pace of the liberalization cannot keep up with the process. In order to enhance its competitiveness, AFAS is committed to addressing the substantive process of LTS rather than just from the cooperation agreement. At present, there have been many rounds of negotiation about LTS within ASEAN. After consultation and

**Table 3.**

Labor population in different industries in towns and cities by the end of 2010, Unit: 100,000 people.

Item	Unit: 100,000 people			
	Total	State-Owned Units	Urban Collective Units	Other Units
<b>National Total</b>	<b>13051.5</b>	<b>6516.4</b>	<b>597.5</b>	<b>5937.6</b>
Grouped by Industry of the National Economy				
Agriculture, Forestry, Animal Husbandry and Fishery	375.7	357.4	4.4	14.0
Mining Industry	562.0	234.1	18.8	309.1
Manufacturing	3637.2	416.5	134.4	3086.2
The Industry of Production and Supply of Electricity, Gas and Water	310.5	203.9	5.2	101.4
Building Industry	1267.5	278.7	161.7	827.1
Transport, Storage, Postal	631.1	403.3	19.8	208.0
Computer Services and Software	185.8	62.5	1.0	122.3
Wholesale and Retail Trade	535.1	137.3	48.0	349.9
Accommodation and Catering Industry	209.2	54.6	9.6	145.1
Financial Sector	470.1	144.3	52.1	273.7
Real Sector	211.6	45.4	9.2	157.1
Rental and Business Services	310.1	131.5	37.6	140.9
Scientific Research and Technical Services and Geological Prospecting	292.3	219.6	4.2	68.6
Water Conservancy, environment and Public Facilities Management Industry	218.9	189.9	10.5	18.5
Resident Service and Other Services	60.2	28.9	7.8	23.5
Education	1581.8	1517.4	17.5	46.8
Health, Social Indemnity and Welfare	632.5	562.6	51.4	18.6
Culture, Sports and Entertainment	131.4	113.1	2.2	16.2
Organization Industry	1428.5	1415.6	2.2	10.7

**Table 4.**  
Value added generated by different industries Unit: 100 million Yuan.

Industries	2006	2007	2008	2009
<b>Total</b>	<b>216314.4</b>	<b>265810.3</b>	<b>314045.4</b>	<b>340902.8</b>
<b>Primary Industry</b>	<b>24040.0</b>	<b>28627.0</b>	<b>33702.0</b>	<b>35226.0</b>
Agriculture, Forestry, Animal Husbandry and Fishery	24040.0	28627.0	33702.0	35226.0
<b>Secondary Industry</b>	<b>103719.5</b>	<b>125831.4</b>	<b>149003.4</b>	<b>157638.8</b>
Industries	91310.9	110534.9	130260.2	135239.9
Mining Industry	12082.9	13460.7	19629.4	16726.0
Manufacturing	71212.9	87465.0	102539.5	110118.5
The Industry of Production and Supply of Electricity, Gas and Water	8015.2	9609.2	8091.3	8395.4
Building Industry	12408.6	15296.5	18743.2	22398.8
<b>Tertiary industry</b>	<b>88554.9</b>	<b>111351.9</b>	<b>131340.0</b>	<b>148038.0</b>
Transport, Storage, Postal	12183.0	14601.0	16362.5	16727.1
Computer Services and Software	5683.5	6705.6	7859.7	8163.8
Wholesale and Retail Trade	16530.7	20937.8	26182.3	28984.5
Accommodation and Catering Industry	4792.6	5548.1	6616.1	7118.2
Financial Sector	8099.1	12337.5	14863.3	17767.5
Real Sector	10370.5	13809.7	14738.7	18654.9
Rental and Business Services	3790.8	4694.9	5608.2	6191.4
Scientific Research and Technical Services and Geological Prospecting	2684.8	3441.3	3993.4	4721.7
Water Conservancy, environment and Public Facilities Management Industry	945.8	1110.7	1265.5	1480.4
Resident Service and Other Services	3541.7	3996.5	4628.0	5271.5
Education	6407.0	7693.2	8887.5	10481.8
Health, Social Indemnity and Welfare	3326.2	4013.8	4628.7	5082.6
Culture, Sports and Entertainment	1362.7	1631.3	1922.4	2231.0
Organization Industry	8836.6	10830.4	13783.7	15161.7

Note: Data from China State Statistics Dept. 2011

cooperation over a long period the framework, agreements was reached to include business services, professional services, environmental services, construction, distribution, education, medical services, maritime trade, liberalization of services, information services, etc. (Cockerham, 2010).

Since the 1990s, the PRC accepted the concept of regionalization and entered East Asian economic integration process. Siow Yue Chia, a Japanese scholar, classified the international labor migration (ILM) into unskilled and semiskilled workers on short-term contracts (overseas foreign workers) and skilled professionals and executives (brains). The two types of flows have different determinants and effects and, hence, occasioned different policies in labor-importing and labor-exporting countries (CHIA, 2006). So, why should the PRC not use the ILM to make up for her labor shortage? **Table 5** provides the GDP per capita of the major countries in North-East Asia, Southeast Asia, and South Asia. The table shows that the PRC's annual GDP per capita was USD 10,378 in 2008, when that of Bangladesh was USD 3722 (i.e. 35.86% of the PRC's); that of Cambodia was USD 4029 (i.e. 38.82% of the PRC's); that of Myanmar was USD 5235 (i.e. 35.86% of the PRC's); and that of Viet Nam was USD 5676 (i.e. 54.69% of the PRC's). The GDP per capita in these countries were much lower than that of the PRC.

So, their supplies of low-cost labors can be of potential value to the PRC. The table also shows the labor situations in India, Pakistan, and the Philippines. But **Table 6** below shows that the Indian national poverty rate in 2005 was 27.5%, and the total population in the region was second only to the PRC. So, if their labor supply could remain stable, it would be a good source for the PRC. Meanwhile, Bangladesh's population density is extremely high. And with high population, its poverty rate in 2005 was 40%, which means the country is also a good labor-exporting country.

It can be concluded that in order to maintain economic stability and sustain further improvement in the quality of Chinese population, the PRC's labor strategy can take international labor input into consideration.

### East Asian Unification Process and the Challenge to the PRC

It is necessary to compare the East Asian integration with its European counterpart. The EU was originally designed to promote both economic and political integrations. The former serves as a driving force for the latter. European countries laid aside state sovereignty in the process of integration, and

**Table 5.**  
GDP per capita in USD (purchasing power parity averaged, based on USD exchange rate 1990.

Country or Area	Unit: USD					
	2000	2004	2005	2006	2007	2008
World	<b>13912</b>	<b>15238</b>	<b>15726</b>	<b>16281</b>	<b>16891</b>	<b>17307</b>
High Income	<b>45259</b>	<b>47801</b>	<b>48374</b>	<b>49004</b>	<b>49503</b>	<b>49952</b>
Middle Income	<b>7161</b>	<b>8679</b>	<b>9206</b>	<b>9811</b>	<b>10516</b>	<b>11020</b>
Upper Middle Income	<b>8052</b>	<b>10075</b>	<b>10747</b>	<b>11537</b>	<b>12483</b>	<b>13158</b>
Lower Middle Income	<b>5850</b>	<b>6656</b>	<b>6997</b>	<b>7371</b>	<b>7764</b>	<b>8071</b>
Low and Middle Income	<b>6658</b>	<b>8026</b>	<b>8504</b>	<b>9049</b>	<b>9687</b>	<b>10137</b>
Low Income	<b>2170</b>	<b>2432</b>	<b>2547</b>	<b>2667</b>	<b>2794</b>	<b>2880</b>
China	4660	7048	7710	8536	9574	10378
Hong Kong, China	45644	51079	53714	56305	58517	58605
Bangladesh	2827	3192	3308	3446	3587	3722
Cambodia	3101	3011	3341	3613	3881	4029
India	5061	5879	6276	6714	7124	7445
Indonesia	7926	9056	9547	9944	10312	10671
Japan	40771	43461	44113	44829	45687	45587
Korea, Rep.	31826	35798	36813	38210	39628	40261
Malaysia	20118	22360	23398	24197	25091	25590
Myanmar	3006	4083	4450	4828	5202	5235
Pakistan	7524	7834	8378	8149	8589	8950
Philippines	7034	7246	7389	7687	8066	8260
Singapore	42940	46082	48821	47771	48274	45786
Sri Lanka	11120	10874	11362	12945	13947	14916
Thailand	12638	13961	14374	14926	15393	15548
Viet Nam	3803	4553	4832	5133	5456	5676

Note: World Bank WDI Database. Authors' compilation.

**Table 6.**  
Poverty rates (%).

Country or Area	Year	National	Rural	Urban
China	2005		2.5	
Bangladesh	2005	40	43.8	28.4
Cambodia	2007	30.1	34.5	11.8
India	2005	27.5	28.3	25.7
Indonesia	2010	13.3	16.6	9.9
Mongolia	2008	35.2	46.6	26.9
Myanmar	2005	32		22
Nepal	2004	30.9	34.6	9.6
Pakistan	2006	22.3	27	13.1
Philippines	2009	26.5		
Viet Nam	2008	14.5	18.7	3.3

Note: World Bank WDI Database. Compiled by the authors.

boosted the regionalization step by step (Mostura & Beuth, 2003). However the ASEAN was aimed more at “economic cooperation” (in an idea of “Open Regionalism”) than at integration in its strict sense. Apart from the ASEAN, the APEC focus more on market facilitated economic cooperation and the promotion of economic development and economic liberalization, while trying to avoid political and security issues (Sudsawasd, 2011). The South-East Asia has a diversified culture including profound religious, ethnic, and linguistic differences. The regional integration in East Asia would be slower than that in Europe.

As Michael North and Barnard Turuer pointed out, “Regional integration may also be enhanced by growing political, economic, and cultural interdependence and exchange, since the exchange of people, capital, know-how, and innovations are no longer hindered by political borders. The ILM issue belongs to the exchange of people (North, 2010).

From **Table 7** we can see that, since the ASEAN established in 1967, 54 public service agreements were signed, mainly for

industrial projects, energy, transport, education, training, environment, and so on; but there were no labor supply and service agreements. The PRC could, based on the 10 + 3 cooperation scheme, ease her labor shortage by importing labors and negotiating about labor service cooperation agreements, including southern Asian nations (Dent, 2009). With the accession of new members, the cooperation may cover more tasks, including those in labor services. To supply excessive labors to the PRC may largely be in accordance with the original intent of cooperation. The cooperation, as it deepens, may ease the regional tension to certain extent.

Theoretically the idea should be feasible. Of course capital flows (to make international capital investments in lower labor cost regions) can be faster than labor flows in the regional integration process. In accordance with general equilibrium economic theory, this argument was valid. However, in reality, capital redistribution also involves the cost of time.

$O \text{ days} \square C \text{ Capital Transition Period} \leq P \text{ Population Transition Period}$

**Table 7.**  
Types of integration in common services of ASEAN’s principal agreements, 1967-2007.

Types of service	Number of agreements with types of integration
Industrial Projects	8
Energy	7
Transportation	7
Scientific	6
Education and training	4
Environment	3
Tourism	3
Agriculture	3
Telecommunications	3
Public administration	2
Cultural activities	2
Emergency	2
Forestry	2
Water	1
Engineering	1
Architecture	1
Nursing	1
Surveying	1
Legal	1
Investments	1
Finance	1
Customs	1
Cosmetics	1
Health	1
Investments	1
Currency Exchange	1
Total number of agreements	54

Note: Agreement may include more than one type of integration.

Obviously, the formula is established.

It should be noted that findings in this are derived from a short-range analysis of the PRC's population strategy rather than an examination of a medium or long term development. So such a fundamental premise of this discussion should be meaningful.

But it must be pointed out that the PRC needs to open her labor market to the world, and should combine this policy with outsourcing business, industrial restructuring and upgrading. Taking advantage of East Asia regional integration can rebalance the human resource supply and demand in the PRC and, in so doing, avoid the international capital investment risks. In a short term, this strategy will be able to fill the gap in labor supply that has emerged in the PRC, a gap that may cause social instability. According to **Table 3**, there are 57.777 million people engaged in such four main sectors as mining, manufacturing, construction, electricity gas and water supply. As much as 37.04% of the manufacturing had been restructured by the time of the survey. The other three sectors were still in need of large number of unskilled and semi-skilled labors in long-term.

At the same time, the PRC's secondary industry—mainly the manufacturing industry, an industry that takes up 62.96% of the total workforce—still need to be restructured. This is a huge and difficult task that cannot be fulfilled within one day. Therefore, capital transfers and international labor migration in bilateral initiatives can be of help to circumvent capital idle period before transferring, ensure effective capital utilization, and cover up the labor shortage. At the same time, the Industries can capitalize the employment gap profitably. By that we mean to open the PRC's labor market, to improve the population quality in the PRC, to import sufficient qualified labor to the country, to win the time and opportunity over the next decade, and thereby to bring a new economic growth cycle in China.

Meanwhile, the strategy would provide the PRC a longer period of social stability before future explosion of the aged population occurs. The strategy would also help combat the harm caused by unfair employment. The number of skilled and

educated workforce decides the optimization of allocation scale of capital. At present, the PRC's skilled and educated workforce remains limited, and there needs to be a huge amount of finance to support the future aging population. Perhaps in future the PRC may still need manufacturing, for instance the employment number continues to increase in construction industry in recent years when the PRC reaches 50% of urbanization. The PRC may really need short-term international help with regard to labor supply. Walking into the Asian economic unification would be one significant step for the PRC.

### Conclusion

By 2030, the PRC will truly meet 50% of the total population dependency ratio. Now they still have a bonus period of 18 years. One cycle of the skilled population takes at least 30 years to grow up after adequate training. The PRC's population is currently following a trend of inversed elimination and time is needed to counter-reverse the trend. The improvement in population quality would need a longer period. At present, the lower income industries excluding farming, forestry, animal husbandry and fishery contributed 44.24% of total added value in the PRC. Therefore, it would be irrational to make massive industrial restructuring.

At present, the core target of the family planning policy to stabilize the low fertility level should not be changed. The PRC's population must be controlled strictly and effectively.

Cooperations among Asian nations are all necessary regardless of the lengths of their terms. The first step should go for short-term to take advantage of the East Asian integration framework and to negotiate labor service cooperation. The barriers should be removed and the policy cost and economic cost should be reduced through negotiations. Mutual trust should be built up, so that foreign labor costs can gradually match the domestic costs to make up for the current labor shortage in the PRC.

Following formulas show the social wealth equilibrium model under the ideal conditions:

$$\begin{cases} \alpha \Delta H_{\text{short}} + \delta \cdot \eta \sum (L_{\text{GDP}} - L_{\text{wage}}) - P_{\text{short}} - C_{\Delta H_{\text{short}}} = \Gamma_{\text{stage,short}} \{ \alpha \leq \eta, \Gamma_{\text{stage,short}} \in [1, 18] \} \\ \beta \Delta H_{\text{long}} + \delta \cdot \xi \sum (L_{\text{GDP}} - L_{\text{wage}}) - P_{\text{long}} - C_{\Delta H_{\text{long}}} = \Gamma_{\text{stage,long}} \{ \beta \gg \xi, \xi \rightarrow \min, \Gamma_{\text{stage,long}} \in [18, +\infty) \} \end{cases}$$

$H$ —Social wealth generated by skilled population

$\Gamma$ —Annual accumulated social wealth

$L$ —Social wealth generated and wages paid from foreign cheap labors

$C$ —Training costs for skilled population

$P$ —Costs supporting the Aging population

$\delta$ , condition exists when rupture of Asian integration and war occur, the factor tending to 0. As the integration process tends to perform better, the factor tending to 1, i.e.  $\delta \in [0, 1]$

$\xi$ , refers to the economic return rate contributed by the PRC's skilled population in a short term of 1 - 18 years on the condition of incompleting employment;

$\eta$ , refers to the economic return rate contributed by the PRC's skilled population in a long term of over 18 years in the condition of completed employment, i.e.  $\eta \geq \xi$ ;

$\Gamma_{\text{stage,short}}$ , refers to uncertain factors, according to situation changes in the PRC.

The first formula tells us that when the PRC's total population raising rate rises above 50% and ranges 1 - 18 years of

short-term population strategy, the PRC's social total annual wealth volume is balanced by the high expenditures of the skilled population and the expenditures for lower margin of the ageing population, corresponding to the limited industries of high value added limited by number of high quality population, and continuing to maintain huge scale of pillar but low added value industries.

The second formula shows that, after implementing the medium and long-term population strategy for 18 years, the PRC's annual accumulated wealth will be balanced by skilled population and high expenditure, and the expenditure to support the gradually increased older population.

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