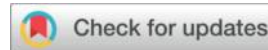


Supply-Demand Imbalance Mechanisms in the Talent Market Driven by Consumption Upgrading and Industrial Upgrading



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Abstract

Under the promotion of economic reform, demographic change and adjustment of industrial structure over recent years have also significantly affected China's labour market structure. Examines China's talent market supply-demand imbalance mechanisms at present, focusing on two sources of increased demands from consumers and industry upgrades separately. Based on the dual labour market theory, this paper puts forward a "Double-upgraded talent mismatch transmission model", which shows that the two forces together cause structural talent imbalances through three channels of quantity mismatch, quality mismatch and spatial mismatch. After updating in 2024, it is found that the imbalance has become more pronounced; The rise of the digital economy, advanced manufacturing and services creates a shortage of talents for which no education and training system can meet. Based on this, some policy directions for guiding the development of talents are proposed according to changes in China's economy and society.

Keywords

Dual Labour Market; Structural Imbalance; Consumption Upgrade; Industrial Upgrading; Hukou System.

1. Introduction

Because of China's Opening-UP policy in 1978, the structure of talent has changed several times in the Labour Market. For more than half a century, the core feature has been the dual structure: A large amount of cheap labour to support export-oriented manufacturing; A substantial growth in higher education that produces increasing numbers of college students. Early studies found that there were simultaneous phenomena of a shortage of migrant workers and a large number of

graduates unemployed; This was caused by two institutions—the Hukou System—and the expansion of higher education.

Today, it is more pronounced still. In 2024, more than 10.8 million college students graduated and joined the labor market; Youth Unemployment reached its peak in June 2023 and was stopped from being published by the National Bureau of Statistics. Advanced Manufacturing, Digital Industry and High-end Service also have a long-term shortage of specialised technical personnel. It has not been merely an issue of labour volume, but rather indicates that there is a considerable deviation in the structure among the available talents relative to changes in required abilities due to economic transformation.

Two significant demand-side factors driving this mismatch. Consumption upgrade refers to an increase in high-value consumption such as health care, cultural activities, tourism and digitalisation; Therefore, there is a need for more labourers in these fields. Industrial Upgrading - Labour-intensive industries have evolved into advanced Manufacturing and artificial Intelligence and Environmental Protection Industries, requiring different occupational skill levels. Combined, these factors are driving changes in the demand-side of China's talent market more quickly than the adaptation of the supply-side; This imbalance is not fully reflected through conventional labour-market analysis.

As shown in Table 2-1 below: Chapter II The Analysis of the Evolution of Labor Market Segmentation through the Hukou System. The evolution of the migrant labour market under pressure of upgrade. Chapter 4 Analyse The Higher Education Market And Strengthening Graduate Employment Crisis. Chapter 5 Identifies the Key Mismatch Mechanisms. Chapter Six: Policies for implementation. Seventh Chapter Conclusion.

2. The Hukou System and Labor Market Segmentation

2.1 Historical Evolution and Structural Role

In 1958, the establishment of the Hukou household registration system provided an institutional foundation for China's dual-labour-market Structure. Classifying residents into farmers or non-farmers thus established a structure that restricted access of rural workers to urban social rights, such as education, medical care and assistance [1]. As the core obstacle to China's labour-intensive development mode, this led to a stable inflow of cheap rural labour into coastal manufacturing clusters and relative insulation between urban and rural labour markets on this basis.

After the 1978 reform, the temporary residency system established in 1985 initially permitted rural labourers to engage in work in cities for the first time [2]. As a result of this, there was repeated influx of immigrants; the number had reached approximately three hundred and forty million by 2010 [3]. Throughout this stage, the Hukou System served both functions of enabling migration and institutionalising marginalisation; it denied migrants access to urban public

Services but enabled them to be a structurally disadvantaged and low-Cost labour pool for employers.

2.2 Reform Progress and Remaining Barriers (2015–2024)

Starting from 2014, to relax residence-related policies across the country and specifically focusing on smaller-sized urban areas since then. In 2019, the reform plan removed Hukou-based barriers in cities with fewer than three million people[1]. By 2023, China's urbanization rate reached 66.16%, compared to 56.1% in 2015, reflecting accelerated population mobility [4].

Still has some problems. Mega-cities like Beijing and Shanghai still have tight control over Hukou acquisition through point-based systems that favour highly skilled migrant workers with advanced education[1]. As industrial restructuring advances, demands of focus cities for talent shortage problems arising from changes in population mobility due to restrictions on household registration systems have become more pronounced. College graduate difficulties in obtaining urban Hukou at their destinations are still a source of structural frictional unemployment [2]; migrant workers entering transition have been excluded from urban welfare systems and lack motivation for skill enhancement required by industrial upgrading.

3. Evolution of the Migrant Labor Market

3.1 Demographic Transition and Shifting Labor Supply

In 2022, China's total fertility rate was close to 1.09 worldwide and one of the world's lowest[4]; there were 925 million workers aged 16-59 in 2011 compared with only 857 million by 2023 (see Figure 4). In 2023, the average age of the migrant population was 43.1 years, up from 40.8 in 2019 and 38.3 in 2015[5]; this structure-aging trend has exacerbated the intensity of the age-preference misalignment problem observed in export manufacturing based on previous studies [6]. Table 1 shows the main verifiable demographic Changes of China's migrant workers from 2015 to 2023 based on direct reference to the nationwide annual migrant-worker-monitoring surveys conducted by the National Bureau of Statistics.

Table 1: Key Demographic Trends of the Chinese Migrant Workforce (2015-2023)

Indicator	2015	2019	2023	Trend
Total migrant workers (million)	277.47	290.77	297.54	↑ Gradual increase
Average age (years)	38.3	40.8	43.1	↑ Accelerating aging

Indicator	2015	2019	2023	Trend
Share aged 30 and below (%)	32.9	27.8	23.2	↓ Sharp decline
Share aged 41–50 (%)	26.4	29.2	33.6	↑ Rising dominance
Average years of schooling	9.6	9.8	10.1	↑ Slow improvement

Source: National Bureau of Statistics of China, Migrant Worker Monitoring Survey Reports 2015, 2019, 2023 [5]

Given that the younger generation of migrant workers is dwindling, some industrial sectors experiencing automated upgrades find it difficult to fill high-tech positions due to an ageing workforce and fewer youth entering secondary education after school. The demographic-and-education-based mutual reinforcement forms a self-reinforced cycle of reduction in the supply of migrant workers.

3.2 Industrial Upgrading and Demand for Technical Labor

China's industrial robot per manufacturing worker ratio was about 392 by 2022, up more than seven times higher than that in 2015 (approximately 49)[7], ranking among the world's most automated economies having highly automatised manufacturing industries. As a result of this swift industrialisation, there is a high demand for skills in operation, maintenance and software programming to run such equipment; These new demands are beyond that of general low-skill working classes.

The development of China's new-energy-vehicle Industry shows that dynamically. NEV output was 9.587 million units in 2023 and is currently the world's largest NEV-producing country [8]. NEV manufacturing needs workers skilled in the batteries Management System, smart vehicles Software development, and precise Robotics - but aging migrant Workers or generalists Colleges do not have sufficient talent pool to meet this requirement. According to the Ministry of Human Resources and Social Security's identification in 2023 as one of the top ten most urgently needed professions[9], there is a shortage of talents for new energy vehicles that has yet been met by current training systems.

3.3 Consumption Upgrading and New Employment Patterns

In 2023, the share of China's Service industry was 54.6%, compared to 44.2% in 2012. As per the State Administration for Market Regulation (SAMR), at around 200 million people, the proportion of flexible workers was about one-tenth by 2023[4]; Among them, more than half worked in platforms such as food delivery services, rideshares, e-commerce logistics and so on[9]. Platform-type job offers

an income stream, However it lacks the space for deepening education and career development.

New consumption sectors such as elderly care, early childhood education, healthcare and fitness, cultural Tourism have generated considerable labour demand but lack sufficient qualified talent supply. As China's elderly population is growing quickly, the proportion of people aged 60 and over reached 21.1 per cent by 2023 [4]; however, this expansion has surpassed what the current vocational education system can offer adequately large-scale. This pattern shows how consumption upgrades create new, expanding categories of labour demand for which there is a structural shortage in the talent supply system.

4. The Higher Education Market and Graduate Employment

Pressure

4.1 Quantitative Expansion Without Structural Alignment

From about 1 million per year between 1999 and 2024, the total number of college graduates is predicted to reach as high as 12.22 million by 2025 [10]. In 2022, the gross enrolment rate of higher education was 60.2%, up from 9.8% in 1998; as a result, China has moved from having a small number of top-tier universities to being close to universalisation for college admissions[11]. According to a 2023 survey conducted by China's top independent graduate-employment data collection institution, MyCOS Research Institute, among which about 47 per cent of graduates stated that their majors were neither related nor loosely related to their jobs; [12] Previous studies have shown that there is wage rigidity on the higher education labour market to prevent efficient allocation through price mechanisms; thus, persistent high-employment gaps among graduates persist[2].

4.2 Discipline Mismatch Under Dual Upgrading Pressures

Artificial Intelligence, Data Science, Integrated Circuit Design, New Energy Technology are facing serious problems of talent shortage; The supply-side for some traditional subjects, including humanities and General Management, exceeds employers' actual needs. A 2022 ministry of industry and information technology report stated that China has a notable and growing shortage of people who are highly skilled in digitisation; artificial intelligence and big data were ranked as the two most under-supplied skills among those involved[13]. In 2023, the number of postgraduate students enrolled was around four million, more than ten times higher than about 400,000 in 2003[10]; Also showed that many people are studying for an MBA because they failed to find employment in this difficult labour situation. There is also the risk of postgraduates' inflation causing another layer of credential mismatch; more and more master's degree-holders will be competing for jobs previously reserved for bachelor's graduates[12].

4.3 The Minban University Problem Revisited

According to the Ministry of Education's statistics for 2022, there are about 831 private Minban universities and above that accept over five hundred thousand students nationwide [11]. Since the implementation of the "Double First-Class" university building campaign in 2017, there is a notable gap in quality among top-ranked public universities and those at lower levels of private school system, as some Minban schools still face challenges such as teacher stability and academic qualification credibility during this period. [14] Graduates of lower-level Minban colleges have dual challenges due to their inadequate qualifications for high-skilled technical positions and excessive wage expectations compared to those of vocational school students; This structural positioning is hard for the migrant labour market or skilled technicians' fields to absorb [2] [14].

5. Mismatches Mechanisms: A comparative analysis

5.1 Three Channels of Structural Mismatch

China's talent market exhibits a supply-demand gap through three independent yet linked mechanisms: two upgraded forces interact with institutional restrictions to produce an asymmetry. Tables 2 compares the three kinds of mismatch channels and presents their main drivers, prominent manifestations, institutional amplifiers and policy recommendations accordingly.

Table 2: Three Channels of Talent Market Mismatch under the Dual-upgrade.

Mismatch Channel	Primary Driver	Key Manifestation	Institutional Amplifier	Policy Priority
Quantity Mismatch	Oversupply of generalist graduates; undersupply of technical specialists	10.76M graduates annually vs. critical shortages in NEV, AI, and care sectors	Enrollment quota rigidity disconnected from labor market signals	Rebalance enrollment toward STEM and vocational fields
Quality Mismatch	Curricula lag behind industry competency requirements	47% graduates report major-job irrelevance; widening Minban quality gap	Education governance inertia; weak university-industry linkage	Demand-responsive curriculum reform; industry co-design
Spatial Mismatch	Geographic concentration of upgrading	Talent surplus in inland	Hukou system restricts	Expand Hukou reform;

Mismatch Channel	Primary Driver	Key Manifestation	Institutional Amplifier	Policy Priority
	clusters combined with restricted labor mobility	regions; shortage in coastal and NEV industry hubs	inter-city talent flow	portable social insurance entitlements

Source: Compiled by authors based on [1][4][5][9][12][13][14]

5.2 Standard Labour Market Model Analysis

Demographic ageing and a shrinking young labour force have caused the supply curve to shift left; Advanced Manufacturing and Upgraded Service Industries' increased demands for technical skills have pushed the demand curve to the right; Wage hikes accordingly occurred among this group. [3][6] Low-skill migrant workers face simultaneous reductions in job opportunities and income due to automation; hence, there is now a two-tiered effect at work.

The supply curve continues to shift rightward in the higher education market by expanding enrolment over ten million college students each year [10]; Demand diverges: Shifts towards a right of highly skilled workers (tech-specialisation) but remains stable/generalises for more generalists graduates from oversupply areas. Wage persistence hinders market-closing adjustments and continuously promotes structural unemployment especially for graduates of secondary schools.

5.3 institutional amplification of mismatch

The institutional constraints function in an amplifying mechanism, not through a correction process for the discrepancies among channels themselves. The Hukou system restricts ageing migrant workers from entering the city's urban training programme to help them adapt to upgrading of consumption structure [1]. The university admission quotas are arranged through bureaucratic means without considering labour market information, resulting in oversupply at universities with weak connections and underdevelopment for disciplines strong sectors. [13] Combined with these institutional rigidity factors, the talent-supply system's structure is far from aligning with the demand-side structural reform promoted by the upgrade of both industries; thus, this labour market presents an evident phenomenon of significant long-term imbalances in the distribution of talents.

6. Policy Recommendations

6.1 Reforming Higher Education and Vocational Training

Universities should strengthen rapid response Curricula in accordance with the requirements of new technologies and industries to promote expansion across fields such as Artificial Intelligence, green economy, high-end equipment Manufacturing and service Economy. [13] The 2022 revision of the Vocational

Education Law is a positive move towards revamping the rehabilitation of vocational training as one of the main career channels; however, implementation should be sped up and investment increased to form a high-skilled talent team needed for industrial upgrades. Government-innovation-sector collaboration on jointly developing courses, establishing internship systems, etc., needs institutionalisation at the national level to address the structural mismatch between education and employment by reducing time lags in skill development [14].

6.2 Deepening Hukou Reform

Extend the reform of Hukou to regions where industrial upgrading clusters are more pronounced, and lower residence requirements there. Social Insurance Portability Reform for migrant workers and university graduates has accumulated pension and medical treatment entitlements in multiple regions; thus reducing relocation expenses can mitigate the risk associated with geographical mismatches. Above-referred reforms have mainly focused on solving the spatial mis-match problem by increasing scope for reallocation among regional, sectoral talent supply and demand through market mechanisms.

6.3 Coordinating Industrial and Talent Development Policy

Sector-specific talent planning: Explicitly connect industrial upgrade objectives of manufacturing, digital economy and green development with universities' enrolment changes and vocational training investment to shorten the time gap between industrial demand and talent supply structure [9]. The new-energy-vehicle-related government-industry-university collaboration has started building special technical talent supply lines; therefore, it is possible to create an organisational coordination pattern that can be systematically expanded in all the key upgradation areas [8].

7. Conclusion

The talent market imbalances in China have significantly changed since the previous study of the double-layered labour-market paradox. Nowadays, it has become more complicated and organically embedded; under the dual pressures of consumption upgrades and industrial upgradings accelerating changes to the demand-side structure of the talent market at a pace faster than the supply-side can adjust itself. The three types of mismatches, namely quantity, quality and space, in combination create structural talent gaps; The institutional constraints of the Hukou system and education governance actually exacerbate these gaps without addressing them. Every year approximately 10 million Chinese college graduates are scheduled for graduation, with a higher proportion of students coming from rural backgrounds who are older than or equal to 43 years old; The speed at which Technologies like New Energy Vehicles, Artificial Intelligence and Advanced Manufacturing upgrade is accelerating too. For such imbalances, not just small-scale modifications but large systematic reforms across higher-

education governance, vocational-training funding, Hukou-policy liberalisation and industrial-talent-planning are needed instead. The problem-solving task can only be completed in the course setting through students' practical activities and exploration to achieve educational goals; otherwise, it cannot have significant impact on students'.

References

- [1] Melander, A., & Pelikanova, K. (2013). "Reform of the Hukou system: A litmus test of the new leadership." ECDIN Economic Brief, (26).
- [2] Yang, X. (n.d.). The Transition Process in Chinese Labor Market. Honors Thesis, Economics and Management Department.
- [3] Rush, A. (2011). "China's Labour Market." Bulletin, Reserve Bank of Australia.
- [4] National Bureau of Statistics of China. (2024). China Statistical Yearbook 2023. Beijing: China Statistics Press.
- [5] National Bureau of Statistics of China. (2015, 2019, 2023). Migrant Worker Monitoring Survey Reports. Beijing: NBS.
- [6] Chan, K. W. (2010). "A China paradox: Migrant labor shortage amidst rural labor supply abundance." Eurasian Geography and Economics, 51(4), 513–530.
- [7] International Federation of Robotics. (2023). World Robotics Report 2023. Frankfurt: IFR.
- [8] China Association of Automobile Manufacturers. (2024). China Automotive Industry Development Annual Report 2023. Beijing: CAAM.
- [9] Ministry of Human Resources and Social Security of China. (2023). National Labor Market Supply and Demand Analysis Report 2023. Beijing: MOHRSS.
- [10] Ministry of Education of China. (2023, 2024). National Education Development Statistical Bulletin. Beijing: MOE.
- [11] Ministry of Education of China. (2023). China Education Statistical Yearbook 2022. Beijing: People's Education Press.
- [12] MyCOS Research Institute. (2023). 2023 Chinese College Graduate Employment Annual Report. Beijing: MyCOS.
- [13] Ministry of Industry and Information Technology of China. (2022). China Digital Economy Development Report 2022. Beijing: MIIT.
- [14] Li, Y. A., Whalley, J., Zhang, S., & Zhao, X. (2011). "The higher educational transformation of China and its global implications." The World Economy, 34(4), 516–545.