THE DECAY OF JAPAN'S LABOUR MARKET: NEW IMMIGRATION POLITICS AND THEIR IMPLICATIONS ON THE NATIONAL LABOUR SHORTAGE

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ABSTRACT

Japan's population decline is destabilising the national labour market. In response to the demographic threat, in April 2019 the Japanese Ministry of Justice officially introduced the new Specified Skilled Worker policy. This 'temporary' labour migration programme was designed to alleviate the domestic labour shortage by intensifying the acquisition of global human resources. Yet whether this political measure is capable of reducing the deficit remains to be seen. By reviewing the government's prior and current labour supply strategies, this study aims to assess the policy's potential to contribute to the consolidation of the national employment market. By highlighting structural deficiencies and proposing some reforms, this article seeks to ignite a public debate about the need to revise the current Specified Skilled Worker policy in an attempt to halt the decay of Japan's labour market.

Keywords: Demographic Change; Labour Economics; Labour Market; Labour Supply; Migration Policy

1. Introduction

Japan appears to remain loyal to its state philosophy of 'almost completely' closed borders. On March 18, 2020, at the onset of the COVID-19 pandemic, Japan abruptly closed its frontiers (Ministry of Foreign Affairs (MOFA) 2020). What followed was the establishment of a modern iron curtain: an entrance ban that prevented nearly every non-native person from entering the country. It took more than two years until the government, led by prime minister Kishida Fumio, decided to allow foreign citizens again to relocate to Japan. The exclusion of foreigners was politically justified by the desire and responsibility of the government to safeguard the health and lives of Japanese citizens, in line with the credo of the country's ruling political faction, the Liberal Democratic Party (LDP) (2018, para. 1) of 'the responsibility to protect Japan'. During

the pandemic, however, the government placed no restrictions on the transnational mobility of Japanese people. The international community became increasingly vocal in its condemnation of the government's inconsistent and disproportionate inhibitory border policy. As a consequence, Japan suffered severe reputational damage, being again branded as a 'foreigner unfriendly' country (see Yokoe, 2022). The Soviet Union's and Japan's 'iron curtains' had one common feature: they severely and permanently damaged the idea of transnational solidarity and cooperation. While the COVID-19 pandemic could be considered as special circumstances, it is precisely during such times that a country's political discourse reveals its essence through the divulgence of its lived values and principles. The onset of the pandemic was a crucial moment as it compelled policymakers to choose between cultivating multilateralism and embracing isolationism. To the dismay of the transnational community, the policymakers chose the latter. This policy gave Japan the reputation of being an internationally inhospitable country at a time when it was formulating policies to increase its attractiveness as a migration destination to alleviate its labour shortage.

Section 2 of this article provides an overview of the current demographic transformation of Japanese society and its effect on the constitution of the domestic labour market. After outlining the extent and expected trajectory of the national human resource deficit, section 3 discusses the countermeasures conducted in the era of the former prime minster Abe Shinzo, focusing on the research and development (R&D) of new robot technologies. Section 4 briefly elaborates the history and framework of Japan's modern immigration policies, namely the Technical Intern Training Program (TITP) and the Specified Skilled Worker (SSW) status of residence. Section 5 consists of a critical assessment of the SSW policy as a potential solution to the national labour shortage. In an attempt to identify shortcomings and propose reforms, the labour migration policy is evaluated on the basis of three factors: acquisition capacity, anti-attrition capacity and sustainability capacity. The article ends with a brief conclusion and an outlook on Japan's potential economic development.

2. Progression of the Demographic Shift

Japan is presently confronted with two major social challenges. First, its population is rapidly ageing, with Japan known as a 'super-aged society', one in which more than 20% of the population is 65 years or older (UN in Koohsari et al., 2018, p.2). The Statistics Bureau of Japan (SBJ) estimated the proportion of peopleaged 65 years or older in Japan's population to be 28.8% in 2020, with the proportion predicted to reach 38.1% in 2060 (MIC, 2020). Second, Japan's birth rate has declined drastically over the past decades. According to natality statistics provided by the Japanese Ministry of Health Labour and Welfare (MHLW), the total fertility rate (TFR) of the country has decreased from 4.32 in 1949 to a critical 1.36 in 2019 (MHLW,

2021)[1]. The ministry paints an even bleaker picture, forecasting a further deterioration of the TFR in future (MHLW, 2021). A decline in the fertility rate negatively affects the overall population growth. According to projections of the Japanese National Institute of Population and Social Security Research (IPSS), the country's population will decrease from over 127 million in 2015 to approximately 88 million in 2065 (IPSS, 2017). Many modern societies are facing the risk of diminished vitality due to demographic changes. As a result of the above-mentioned changes, in 2019, the country recorded one birth every 36 seconds but one death every 23 seconds (MHLW, 2021). In other words, death is outpacing life. As a consequence, the country is now caught in the momentum of a so-called shrinking society. In a vigorous society, the ageing of the population is naturally compensated by the birth of new members, resulting in a healthy balance between younger and older people. However, Japan's social equilibrium has been lost, along with the functionality of this control mechanism. The ageing and shrinking of society has led to the unsaturation of the national human capital market. In other words, the country is currently facing a severe labour shortage (e.g., Jones & Seitani, 2019). Although there is no universal definition among economists, Barnow et al. (2013, p.3) define a labour shortage as 'a sustained market disequilibrium between supply and demand in which the quantity of workers demanded exceeds the supply available and willing to work at a particular wage and working conditions at a particular place and point in time'. In 2018, the national labour force deficit reached 40%, with a further deterioration expected (MHLW, 2019). The declining workforce is facing an increased burden in maintaining the functionality of the social order. According to a supply and demand study conducted by Japan International Cooperation Agency (JICA) and partners, the country will need around 6.74 million foreign workers by 2040 to ensure that it has a sufficient workforce to meet its labour requirements (JICA, 2022). Any attempt to increase the labour force through immigration will be made more difficult by the demographic transition to a shrinking population being not just a phenomenon limited to Japan, but rather a global one. International job vacancy rate statistics reveal that numerous industrialised nations are currently confronting labour shortages (Statista, 2022). From an economic perspective, this leads directly to the correlating relationship between supply and demand. At some point, the increasing demand for foreign human capital will unavoidably exceed the limited international supply, which will stimulate global rivalry. In the near future, Japan will thus face stronger international competition for foreign human resources. The country's historical aversion towards multi-culturalism (e.g., Morita, 2015), however, suggests, that Japan will be at a competitive disadvantage.

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[1] According to OECD (2022), the 'fertility replacement rate' is around 2.1 children per woman. Reaching this level of fecundity would allow the constant renewal of the population, thus equilibrating society.

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2.1 Policies in the Era of Abenomics

Japan's lack of domestic human capital has long been recognised, and attempts have already been made to address the problem. Former president Abe Shinzo tried to solve the labour shortage by relying on the country's domestic resources, namely women and elderly people. The idea was simple: revitalise the national economy by creating an environment which promotes the integration of female and senior citizens into the labour market. In 2016, within the framework of the government's quest for economic development, it officially introduced the 'Plan to Realize the Dynamic Engagement of All Citizens'. This policy package involved the introduction of three measures to revitalise the labour market, officially pronounced as the 'new three arrows' of 'Abenomics'[2]. First, stimulate the national economy by conducting various work-style-reforms to create a 'robust economy that gives rise to hope' and raise the GDP to 600 trillion yen (Cabinet Office, n.d.a, p.5). Second, provide so-called 'dream-weaving childcare supports' (Cabinet Office, n.d.a, p.5) with the aim of raising the national birth rate to 1.8. Third, improve the nursing care system to reduce the depreciation of human capital from the market, officially described as an act of creating 'social security that provides reassurance' (Cabinet Office, n.d.a, p.5). A closer look at the statistics reveals that during Abe's premiership (2012–2020), the female participation rate in the labour force slightly increased from 42.2% to 44.3% (MHLW, 2020). A similar trend can be seen in the participation rate in the labour force of elderly people (65 years or older), which increased for nine consecutive years, from 19.4% to 25.1% (SBJ, 2021). However, as has been elaborated elsewhere (e.g., Yoshino & Taghizadeh-Hesary, 2014), it is not possible to state with certainty whether these positive changes were solely a result of the policies of Abe's government or due to other factors. Nonetheless, while the data only function as an indicator, Abe's efforts to improve the labour market were based on legitimate grounds. Both women and elderly people have been significantly underutilised and therefore represented an opportunity for the labour market[3]. While the increase in the participation rate represented a positive development, the growth rate was minimal and therefore did not meet the rising national demand. The labour market reforms of Abenomics might have delayed the aggravation of the workforce scarcity, but they were unable to stabilise the labour market.

2.2 Robotics and Society 5.0

While national human resources may be limited, robotic ones are still plentiful. In recent years,

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[2]The term 'Abenomics' describes the economic policy measures conducted under the political leadership of former Prime Minister Abe Shinzo.

[3]According to a labour survey conducted by the Japanese Ministry of Internal Affairs and Communications (MIC) in 2018, approximately 2.37 million women in Japan had a desire to work but were unemployed or engaged in job-seeking measures (Gender Equality Bureau Cabinet Office, 2019).

there has been an upsurge in investment in robot technology R&D. In 2019, the Japanese government spent around 351 million US dollars on research projects related to robotics, automatisation and AI (IFR, 2020). By 2020, Japan had become the largest robot manufacturer in the world, providing 45% of the global supply of industrial robots (IFR, 2022). In addition to being the major supplier in the global market, Japan is now the third most automated nation in the world, having a density of 364 installed robots per 10,000 employees in the manufacturing industry (IFR, 2021).

Wilson (2019) wrote once an article titled 'Are robots finally getting a good reputation?' In the case of Japan, this question has long ceased to arise. As a result of the country's popular culture, pioneered by manga and anime such as *Astro Boy* (1952)*, Doraemon* (1969) and *Mobile Suit Gundam* (1979), Japanese people have a broadly positive opinion of robotics (see Bartneck & Hu, 2004; Krebs, 2006; Nakao, 2014). Therefore, it was unsurprising that the authorities would jump on the robotic bandwagon. In 2015, as part of the '5th Science and Technology Basic Plan', the Japanese government officially introduced a new societal concept called 'Society 5.0', which was described as '[a] human-centered society that balances economic advancement with the resolution of social problems by a system that highly integrates cyberspace and physical space' (Cabinet Office, n.d.b, para. 1). The idea behind the 'super smart society' was simple: satisfy the demand for human capital with robot capital. One year later, the Ministry of Economics, Trade and Industry (METI) launched the 'Robots for Everyone Project', a call for new innovative thoughts and ideas about how to best utilise robots in the service industry (METI, 2016). This approach intended to explore the potential future usage of Japan's smart robotics industry for tackling the socio-economic challenges of the country.

Essentially, the use of robotic technology offers two viable strategies when addressing the labour force shortage: complementation and substitution (see Kitahara &Shinozaki, 2019; Schwabe & Castellacci, 2020). Cooperation between robots and humans, sometimes referred to as 'co-robo-ration' (METI 2014) can reduce job workloads. This measure would thus minimise or even eliminate the necessity of further human capital acquisition. For example, bionic suits and exoskeletons are already used to support workers in physical heavy work (Yuet al., 2015), whereas nursing care assistance robots such as *Terapio* (Terashimaet al., 2014) have been introduced in hospitals to help medical staff with everyday tasks. *Secom Robot X2,* in contrast, patrols alongside human security guards at Kansai International Airport to improve security (Kansai International Airport, 2021).

In some industries, automation may even eliminate the demand for human capital. Frey and Osborne (2016) estimated that about 49% of jobs in Japan could be automated due to the

progress in machine learning and robotics[4]. Occupations characterised by routine tasks are particularly at risk of being lost to technology worldwide (see de Vries et al., 2020). This represents an opportunity to contribute to solve the labour shortage since low-skilled workers are currently in particularly high demand. Examples of almost fully automated projects include the construction of a dam almost entirely using robots by the Japanese company Obayashi Corporation (Tao, 2020), the development of a prototype warehouse operating almost exclusively by autonomous mobile robots by the firms Konoike Transport and OSARO (OSARO, 2022), and the recent opening of a fully automated AI coffee shop called Root C in Tokyo (Nagase, 2021).

Economists widely agree that the autonomous evolution of the high-technology sector has a significant impact on the labour market, such as the labour productivity (e.g., Fernando et al., 2016; Kromann et al., 2020; Eder et al., 2022), the wage rate (e.g., DeCanio, 2016; Barth et al., 2020) and the employment rate (e.g., Acemoglu & Restrepo, 2020; Kudoh & Miyamoto, 2021). Graetz and Michaels (2018) analysed a panel dataset of 17 selected countries and discovered that the increased use of robots is not associated with a significant deterioration of the employment rate. The study emphasised, however, that the increased use of robots decreases the number of hours worked by low-skilled and middle-skilled workers. Chiacchio et al. (2018) assessed the European industrial labour market and estimated that one additional robot unit per thousand workers reduces the employment rate by 0.16 to 0.20 percentage points. Acemoglu and Restrepo (2020) analysed the US local labour market and concluded that one extra robot unit per thousand workers reduces the employment to population ratio by approximately 0.20 percentage points. In the case of Japan, the lack of empirically supported multivariate analyses makes a statistical assessment of the real effect of robotisation on the constitution of the labour market difficult. However, a few studies (e.g., Adachi et al., 2020; Dekle, 2020) indicate that Japan's employment sector could also benefit from advances in automation.

While the robot revolution has accelerated since the 1950s, automation and AI systems are still in a relatively early stage of development. High-technology usage has merely ushered in an era in which the collaboration between humans and robots has become feasible. The substituting automation of robotics, on the other hand, mainly remains a non-viable option. Although the possibilities of robotics seem almost limitless, there is still a gap between theoretical capabilities and practical applications. Due to the existence of limitations (see Grau et al., 2020; Dzedzickis

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[4]Note that there is little agreement about the proportion of jobs at risk of automation in Japan (see Arntz et al., 2016; David, 2017; Horii & Sakurai, 2020; OECD, 2021). While robotics might eliminate certain occupations, it will concurrently create new job opportunities (see Parschau & Hauge, 2020; Badet, 2021).

et al.,2022; Arents & Greitans, 2022), the market deployment of mechanical labour forces alone does not yet provide an adequate solution to the national labour deficit.

3. Japan's Modern Immigration Policies

This section gives a brief historical outline of the development of labour migration policy in Japan. In 1993, the Japanese government established the TITP. It was advertised as a plan of action aiming to promote the international transfer of skills, technologies and knowledge (Japanese International Trainee and Skilled Worker Organization, n.d., para. 1): a 'benevolent act' of fostering foreign human resources in Japan, which in return could later be used to contribute to the development of the countries of the workers. At present, the TITP allows immigrants to work for up to 5 years and choose between 146 types of jobs in 82 occupational sectors.

Figure 1indicates the success of the scheme: between 2012 to 2022, the number of technical interns working in Japan more than doubled from 134,228 to 343,254, with a maximum of 402,356 workers in 2020 (Immigration Services Agency of Japan (ISA), 2022a).
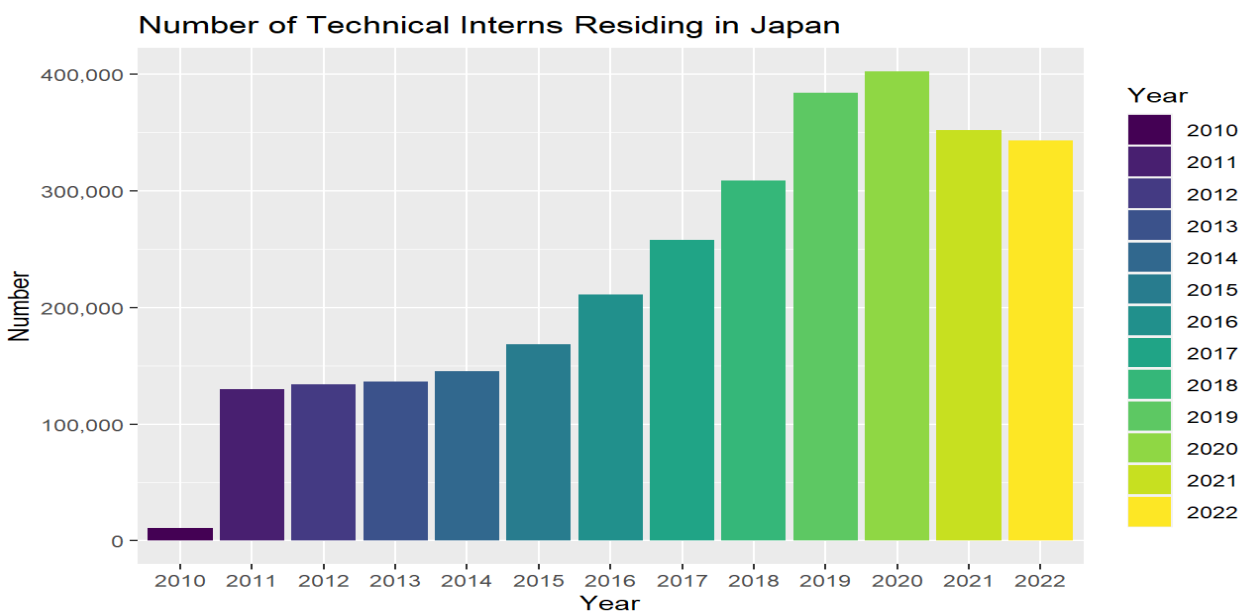

Figure 1. Number of Technical Interns Residing in Japan. Figures from ISA (2022a).

This policy is still the most important strategy in Japan's system of foreign human resource management, since it provides a significant share of the country's external labour force. To provide some context, in 2020 technical interns made up approximately 23.3% of Japan's active foreign labour force (ISA, 2022a). However, the TITP has also shown some critical weaknesses.

Over the years, the programme has on multiple occasions been subjected to public criticism about human rights issues and labour law violations (see Ford, 2020; Yoshikawa, 2022). In 2016, the Japanese government officially reported that 70.6% of the Japanese companies supervising TITP trainees were violating labour laws (MHLW, 2016). These violations include the infringement of work time regulations, unpaid wages and the lack of occupational safety measures. In many cases, technical interns have found themselves forced to abandon their jobs and quietly leave the country (Chonlaworn, 2021, p.43). To illustrate the extent of abuses, according to ISA, between 2013 and the first half of 2022, 61,061 technical interns went missing (ISA, 2022b). In addition, 171 interns are reported to have died between 2012 and 2017 as a result of their employment conditions (Pollmann, 2020). In essence, the interim record of the labour migration policy remains ambivalent, both providing the domestic market with a significant number of external labourers and raising international concerns about Japan's labour practices (e.g., Yazawa, 2021). As a result, policymakers were pressured to embark on a new labour supply strategy. In April 2019, the Japanese government officially introduced the SSW visa system. ISA states that the' Specified Skilled Worker is a status of residence created to give foreign nationals more opportunities to work in Japan' (ISA, n.d., p.1). This policy was planned to be the successor of the previous controversial TITP. By introducing this new type of visa, it was expected that the country would attract 345,150 'semi-skilled workers' within the next 5 years (Hamaguchi, 2019). The introduction of this recent migration programme pursued two political goals: strengthening Japan's international reputation while supplying the national labour market with foreign human resources.

The target group of the new residence status is precisely defined. The Japanese MOFA declares that 'Those who can work in Japan as an SSW must be over 18 years old in a good health, have the necessary occupational skills and Japanese language ability to work immediately without receiving any particular training' (MOFA, n.d., para. 2). The conciseness of the narrative clearly indicates the kind of labour migrants the Japanese government seeks to acquire, in essence, exclusively high-quality foreign human capital. The SSW programme itself is divided into two different categories: SSW (I) and SSW (II). Applicants are mainly recruited into the former category, which covers up to 14 occupational sectors, including nursing care, the industrial machinery industry, the construction industry and the food service industry (ISA, 2022a). Foreign workers who receive a visa with the SSW (I) residence status must renew their status every 4 months, every 6 months or every year for up to 5 years in total. After the maximum time permitted to stay in Japan has been reached, they must return to their home country, and they are not eligible to receive permanent residency. In addition, the accompaniment of family is generally not permitted (ISA, 2022a). After 5 years of work, it is possible to upgrade from SSW (I) to SSW (II). However, the SSW (II) residence status is currently only applicable to two specialised industries: the construction industry and the shipbuilding & ship-related industry

(ISA, 2022a). Here, the period of stay can be chosen to be 6 months, 1 year, 3 years or indefinitely renewable. This category also provides a theoretical option for a family reunion (ISA, 2022a). Since the introduction of the SSW programme in April 2019, the number of SSWs residing in Japan has risen continuously, reaching an all-time high of 173,101 foreign labourers at the end of June 2023 (Figure 2; ISA, 2023).
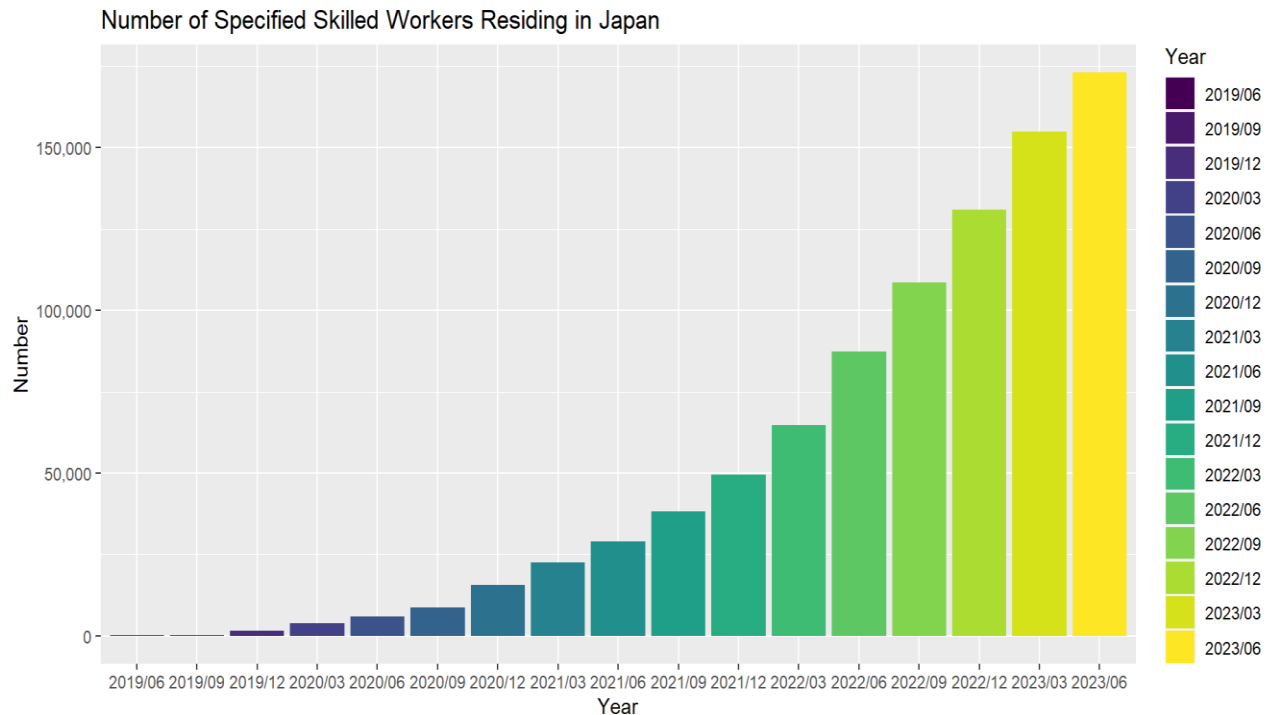

Figure 2. Number of SSWs Residing in Japan. Figures from ISA (2023).

Nonetheless, the labour force acquisition procedure has already fallen far behind schedule. Linearly extrapolating from the data, the number of foreign human resources obtained should exceed 200,000 in 2023. The net acquisition of labour will become more difficult as of 2024, when the first generation of SSW labour migrants reach their 5-year maximum period of stay. Since the authorities have imposed a high barrier for the transition from SSW (I) to SSW (II) residency (Endoh, 2021, p.293), the foreign labour migration programme will unavoidably suffer from a parallel rise in emigration. In summary, despite the promising trend of the SSW scheme, the increase in unskilled and semi-skilled workers is not expected to keep pace with the country's rising demand for new employees.

4. Assessment of the SSW Policy

To discuss the potential of the SSW policy to acquire foreign human resources, it should be

noted that the Japanese political landscape when the programme was established did not encourage progressive concepts of immigration. Since its formation in 1955, the LDP has dominated politics almost continuously (see Köllner, 2006; Umeda, 2019). The political system and its development based on the de facto one-party rulership of the LDP is therefore often referred to as the '1955 system'. Despite the party's name, the 'Liberal' Democratic Party has a conservative and nationalistic view on politics. The lack of a strong opposition has made post-war Japanese politics a static affair. Political discourse is currently dominated by the LDP-Komeito coalition (see House of Councillors, 2022). The present political governance regulates the framework of the social discourse by promoting a conservative and nationalistic view on foreign policy. This includes the desire to maintain the ethnically homogeneous essence of the Japanese state (e.g., Morita, 2015). Regarding the conception of labour migration policies, the discrepancy between socio-economic needs and political desires subsequently translates into a deliberate act of self-sabotage. In other words, the two leading parties are walking a tightrope by trying to solve the labour force shortage through the acquisition of foreign human resources without acting against their own political values by undermining Japan's purported homogeneity. Therefore, the SSW status of residence should essentially be recognised and understood as a factional compromise, as a political experiment. This legislative problem has resulted in three deficiencies of the SSW policy.

4.1 Three Deficiencies of the SSW Policy

When conceptualising labour migration governance policies, three domains must be given particular consideration:

(I)   The 'acquisition capacity': maximising the gain of foreign human resources

(II)   The 'anti-attrition capacity': minimising the loss of foreign human resources

(III)   The 'sustainability capacity': establishing a self-perpetuating labour supply mechanism

Several deficiencies become apparent when the labour migration programme is examined in light of these three capacities.

(I) Restrictive Admission Policy

The substantial number of applications demonstrates that the SSW residence status is still in high demand. Labour acquisition essentially begins with the design and establishment of a coherent admission framework to achieve a sufficient and suitable recruitment rate. Therefore, it is first necessary to consider the proportion of the foreign workforce that has effectively been 'rejected' by the admission structures. Table 1 summarises the published data of the responsible skill

assessment authorities.

Table 1. Skill Assessment Examination Results 2019– June 2022. Figures from ISA (2022c).

	(1) Applicants	(2) Unsuccessful Applicants	(3) Unsuccessful Applicants (%)
Manufacturing Industries (3)	2,954	2,552	86.39
Fishery and Aquaculture Industries	377	200	53.05
Accommodation Industry	7,306	3,588	49.11
Aviation Industry	993	456	45.92
Food Service Industry	28,699	12,676	44.17
Construction Industry	1,189	459	38.60
Automobile Repair and Maintenance	1,811	681	37.60
Nursing Care	51,035	16,664	32.65
Manufacture of Food and Beverages	26,922	6,889	25.59
Building Cleaning Management	2,492	590	23.68
Shipbuilding and Ship Machinery	58	10	17.24
Agriculture	21,457	2,223	10.36

Note: In accordance with the ministerial data presentation, the skill assessment test result of Manufacturing Industries (3) includes the proficiency examination outcomes of Industrial Machinery Industry, Machine Parts and Tooling Industries, and Electric, Electronics and Information Industries.

It becomes apparent that the examination process is designed to be strict, representing a major inhibiting factor that significantly reduces the recruitment rate. In total, from 145,293 applicants, only 98,305 (67.66%) examinees passed the mandatory skill assessment test (ISA, 2022c). The data also reveal a marked variation in the rejection rate among the occupation sectors, ranging from 10.36% to 86.39%. However, it is not only the skills assessment process, but also the mandatory language proficiency examination that constitutes the rigorous selection mechanism. Applicants are required to pass the Japanese-Language Proficiency Test (JLPT) level N4 or the Japanese Foundation Test for Basic Japanese (JFT-Basic) to qualify for the SSW residence status. While the lack of valid data makes a statistical analysis of the linguistic assessment procedure unfeasible, for the Nursing Care Japanese Evaluation Test, the failure rate was 21.67% between 2019 and 2022 (ISA, 2022d). The relatively high failure rates of applicants indicate that a substantial quantity of overseas nationals willing to contribute to Japan's economy

are being intentionally prevented from joining its labour market by the government. The acquisition capacity is therefore significantly underutilised.

Nonetheless, the policy makers deserve to be commended. The acquisition of unskilled and semi-skilled labour under the umbrella phrase 'Specified Skilled Workers' transpired to be a clever political manoeuvre. The name gives policymakers some leeway to 'justifiably' increase the stringency of the acceptance criteria for the programme, whereas in reality, such insistences on skills are not tenable. Namely, such strict admission requirements are essentially designed to minimise the host country's expenses for the acquisition and integration of foreign human capital. This substantiates the national-centric nature of the SSW visa system. The narrative commonly used to defend the policy's strict requirements is based on the assurance of quality workers to avoid a *skill mismatch*[5]. From an economic point of view, this is a valid argument which cannot be ignored. The financial ramifications of a skill mismatch are far reaching, as they can affect employees, companies and the economy as a whole (Brunello & Wruuck, 2021, p.1156). A variety of studies suggest that work incapability leads to a decline in job satisfaction (e.g., Allen & van der Velden, 2001), which in consequence reduces labour productivity (e.g., Albiol Sanchez et al., 2015; Velciu, 2017). Skill mismatches are also associated with an increased employee turnover rate (Bender & Heywood, 2009). Although the government must weigh the threat of potential ability gaps against the needs of the socio-economic structures of the country, given the extent of the national labour shortage, upholding the high expectations seems unreasonable.

Considering the above-presented facts, one feasible proposal to alleviate Japan's labour shortage might be to reduce the basic requirements for the SSW programme, namely a readjustment proportionate to the decline in the national labour market. Research conducted by Barnow et al. (2013) suggests that reducing the minimum qualifications for a job is a valid method for counteracting a company's labour force shortage. In fact, *White Paper on the Labour Economy 2019 Summary* reports that Japanese companies themselves have already started to lower application requirements to counteract the country's labour shortage (MHLW, 2019). Now it is the politicians' turn to follow the companies' lead.

(II) Insufficient Quality of Integration

We next consider the policy's anti-attrition capacity. Guest worker programmes are known to have little concern for migrant worker integration, and the SSW policy is no exception. This is a

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[5]In general, on the micro-level the term 'skill mismatch' refers to a discrepancy between the employee's set of skills and the employer's expectations (see Pellizzari & Fichen, 2017; McGuinness et al., 2018; Guvenen et al., 2020), while on the macro-level it indicates a mismatch between the skill supply and demand in a particular geographic framework (Brunello & Wruuck, 2021).

crucial issue, since insufficient social assimilation deprives the labour market of foreign human capital through increased worker attrition, as discussed below. The concept of "immigration with integration" represents a suitable solution to this problem. The idea behind this approach is to create a feeling of belongingness: to bind foreign individuals to their new social and occupational host environment, incentivising them to remain in Japan for the entire term of their permitted residency. However, what does 'integration' actually mean? Many different models and theories have attempted to conceptualise the assimilation process of immigrants (e.g., Esser, 2001; Entzinger & Biezeveld, 2003; Penninx & Garcés-Mascareñas, 2016; Spencer & Charsley, 2016). Entzinger and Biezeveld (2003, pp.19-30) proposed four distinct fields of integration in their theoretical model: (I) socio-economic integration, (II) cultural integration, (III) legal and political integration and (IV) attitude of recipient societies. A study conducted by de Haas and Fokkema (2011) showed that socio-economic integration is particularly strongly associated with reduced intention of immigrants to return home. Entzinger and Biezeveld (2003, pp.19-25) suggested that the level of socio-economic assimilation can be measured according to factors such as job type (income level), housing and residence patterns, level of education and training, and language competency. The greater the divergence of these factors between immigrants and natives, the lower the level of socio-economic integration. By assessing the SSW policy, it becomes evident that the assimilation of foreign workers has low priority. Patterns of social exclusion can be found in the spatial housing arrangements as well as in the insufficient provision of language and acculturation training. Migrant workers are also bound to certain occupations in the lower-wage sector, which limits their labour mobility in Japan. Even the potential of long-term settlement, though available in theory, is in reality rarely obtainable (see Endoh, 2021, p.292). Reformation of the policy to promote socio-economic inclusion would not only reduce the loss of foreign human capital from the national labour market, but also provide various other economic benefits. Numerous global studies have concluded that socio-economic/organisational assimilation increases work satisfaction (e.g., Dias et al., 2021), which in turn has a positive effect on employee productivity (Böckerman & Ilmakunnas, 2012; Shobe, 2018; Utami et al., 2020). In addition, genuine labour market integration appears to reduce welfare dependency (Brell et al., 2020; Koczan et al., 2021) and boost tax revenue (Koczan et al., 2021), both benefitting the national economy. Fostering assimilation also improves the public attitude towards immigrants in the host country (Neureiter, 2022), which might be an essential step toward introducing the idea of multi-culturalism in Japan's social discourse. Two qualities of the SSW policy particularly require improvement to enhance socio-economic integration: the provision of support and safeguards. In its current form, the social safety net is not designed to fully support temporary workers experiencing hardship (see Tanaka, 2020). Although immigrants are entitled to welfare services, such as educational assistance, legal aid and health care, they are frequently unaware of them or unable to claim them. Access to health services in particular remains an

unresolved issue (Shakya et al., 2018; Yoshino et al., 2021; Matsuoka et al., 2022). It is therefore recommended that communication between ISA, supervising companies and non-native employees regarding their social entitlements is intensified.

Moving from the topic of social support to that of legal protection, the history of the TITP functions as a clear example of how insufficient safeguards lead to the attrition of foreign human resources. Fundamentally, legislative policies are designed to minimise the risk of potential law violations by supervising companies. According to Becker (1968), the incidence of criminal activities is essentially based on two key components: the probability and severity of the expected punishment. Presently, the expected penalties for labour violations against migrant workers and the very limited number of inspections have little deterrent impact on offenders. Fortification of the legislation could serve as an effective bulwark against exploitation, which in consequence would reduce the early return home of migrant workers. In summary, by tightening the policy's supervisory and compliance framework, the anti-attrition capacity could be reinforced.

(III) Absence of Foresightedness

Many countries have used temporary labour migration programmes (TLMPs) to reduce national labour force shortages. The framework and conditions of these 'guest worker' programmes are often similar in nature, focusing on short-term migration for the lower-wage sector. The impact of such time-limited assimilation policies on the socio-economic structures of the host country however, remains highly debated among scholars. Temporary migration programmes are essentially based on the principle of a regular inflow and outflow of foreign human resources, hereafter referred to as the 'circulation effect'. This effect is the core of the problem when dealing with complex phenomena such as domestic labour force shortages. As previously indicated, Japan is not only confronted with increasingly acute labour shortages; it is also facing intensifying global rivalry for foreign workers. In fact, the global labour force market has already become highly contested in regard to the transnational acquisition of both low-skilled workers (Biffl, 2012; Orrenius & Zavodny, 2020) and high-skilled workers (Kerr et al., 2016; Bailey & Mulder, 2017; Burmann et al., 2018). Considering Japan's reputation of being a 'foreigner unfriendly' country, it will be difficult for the nation to acquire a regular flow of sufficient foreign human resources to achieve the government's aim of significantly mitigating the national labour force shortage through the acquisition of external human resources. However, a long-term-oriented labour migration programme would greatly reduce the circulation effect. In consequence, removing the inherent 'gain and loss' mechanism of the migration programme would reduce the systematic attrition of foreign human capital, thereby increasing its efficiency and effectiveness. Moreover, through the potential formation of new immigrant family structures in the host country, a pathway to long-term settlement would help counteract Japan's population

decline and decrease its dependency ratio in the long term, generating further human capital for the domestic labour market. The reconstruction of temporary migration programmes to increase their sustainability is not a new insight and has already been called for by various researchers (e.g., Costa & Martin, 2018; Zou, 2018). Essentially, reform must go beyond a mere transformation of the framework of the TLMP by revising the political principles behind it. Strictly speaking, the central notion of TLMPs of the three 'Rs' (recruitment, remittances and return) (Piper, 2022) must be reoriented towards the concept of three 'Ss' (sign-up, support and stay). When dealing with complex conditions such as domestic labour shortages, transnational recruitment strategies must be planned and implemented with foresight in mind. Due to demographic and social changes, it is expected that the domestic labour shortage will become increasingly severe, making it necessary to devise a sustainable solution.

5. Discussion and Concluding Remarks

An assessment of the constitution of the Japanese labour market highlights the need for sophisticated labour migration policies. Metaphorically, the domestic market resembles a wounded animal which is slowly bleeding out. It is now up to the policymakers to come to its aid. Former Prime Minister Abe Shinzo's attempt to alleviate the national labour shortage by integrating domestic human resources more closely into the market had limited effectiveness. Increased R&D of robotics, on the other hand, has the potential to stabilise the labour market significantly, but current limitations in practical applications eliminate it as a short-term solution. Without further intervention, it is evident that the tightening of the labour market will continue at its current rate in the next few years, and the labour shortage is expected to lead to many socio-economic challenges, as discussed in a large body of global research on labour shortages. For example, Japanese companies may have to accept decreased labour quality, negatively influencing their corporate sustainability and competitiveness (Vasile et al., 2020, p.247). A work force undersupply is also associated with a lower innovation rate (Horbach & Rammer, 2020), a loss of productivity (McGuinness & Bennett, 2009; Dawson et al., 2020; Horbach & Rammer, 2020), and hence reduced profit (Kalimanzila Matemani & Ndunguru, 2019). At a macroeconomic level, labour shortages reduce or even halt economic growth (e.g., Trendle, 2008; Dawson et al., 2020; De Smet et al., 2021). Eventually, they may lead to an increase in inflation (De Smet et al., 2021) or negatively affect national GDP (Dawson et al., 2020). In the worst-case scenario, Japan will enter a severe recession (De Smet et al., 2021). Japanese politicians are correct to consider immigration policies as a tool for enhancing the vitality of the labour market, and a reliance on foreign human resources might be the fastest way to address the labour undersupply. The establishment of TLMPs such as the TITP has shown that such policies can indeed mitigate the national labour force shortage. However, the lack of willingness and commitment towards a more liberal approach to labour migration prevents the most recent SSW

visa system from achieving its true potential. An assessment of the statistical data clearly indicates that in its current state, the new residence status will be unable to make a significant contribution to easing Japan's labour shortage. To avoid a further decline in labour supply, I propose the following reforms to the SSW system. Loosening the entrance barriers to applicants would maximise its acquisition capacity, intensifying the integration process would strengthen its anti-attrition capacity, and providing a feasible option for long-term settlement would increase its sustainability capacity. In summary, the acquisition and retention of global human capital by Japan could be managed considerably more effectively. However, given that the principle of monoethnicity remains firmly anchored in the political discourse, further debates on labour migration are expected to continue to take low precedence. If politicians continue to resist liberalising Japan's immigration policies, the country will be unable to sustain its economic strength for much longer.

Data Availability Statement

The data of the present study are available on request from the responsible author.

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References

Acemoglu, D., & Restrepo, P. (2020). Robots and Jobs: Evidence from US Labor Markets. *Journal of Political Economy*, *128*(6), 2188–2244. https://economics.mit.edu/sites/default/files/publications/Robots%20and%20Jobs%20-%20Evidence%20from%20US%20Labor%20Markets.p.pdf

Adachi, D., Kawaguchi, D., & Saito, Y. U. (2020, May). *Robots and Employment: Evidence from Japan, 1978-2017* (RIETI Discussion Paper Series 20-E-051).https://www.rieti.go.jp/jp/publications/dp/20e051.pdf

Albiol Sanchez, J., Diaz-Serrano, L., & Teruel, M. (2015, April). *Is Self-employment a Way to Escape from Skill Mismatches?* (IZA Discussion Paper No. 9008). https://repec.iza.org/dp9008.pdf

Allen, J., & van der Velden, R. (2001). Educational Mismatches versus Skill Mismatches: Effects on Wages, Job Satisfaction, and On-the-Job Search. *Oxford Economic Papers*, *53*(3), 434–452. http://www.jstor.org/stable/3488627

Arents, J., & Greitans, M. (2022). Smart Industrial Robot Control Trends, Challenges and Opportunities Within Manufacturing. *Applied Sciences*, *12*(2), 937. https://www.mdpi.com/2076-3417/12/2/937

Arntz, M., Gregory, T., & Zierahn, U. (2016, June). *The Risk of Automation for Jobs in OECD Countries: A Comparative Analysis* (OECD Social, Employment and Migration Working Papers No. 189). https://wecglobal.org/uploads/2019/07/2016_OECD_Risk-Automation-Jobs.pdf

Badet, J. (2021). AI, Automation and New Jobs. *Open Journal of Business and Management*, *9*(5), 2452–2463. https://doi.org/10.4236/ojbm.2021.95132

Bailey, A., & Mulder, C. H. (2017). Highly skilled migration between the Global North and South: gender, life courses and institutions. *Journal of Ethnic and Migration Studies*, *43*(16), 2689–2703.https://doi.org/10.1080/1369183X.2017.1314594

Barnow, B. S., Trutko, J., & Schede Piatak, J. (2013). *Occupational Labor Shortages: Concepts, Causes, Consequences, and Cures*. Upjohn Institute Press.

Barth, E., Roed, M., Schone, P., & Umblijs, J. (2020, August). *How Robots Change Within-Firm Wage Inequality* (IZA Discussion Paper No. 13605). https://www.iza.org/publications/dp/13605/how-robots-change-within-firm-wage-inequality

Bartneck, C., & Hu, J. (2004). *Rapid Prototyping for Interactive Robots* [Paper presentation]. 8th Conference on Intelligent Autonomous Systems (IAS-8), Amsterdam, Netherlands. https://ir.canterbury.ac.nz/handle/10092/16926

Becker, G. S. (1968). Crime and Punishment: An Economic Approach." *Journal of Political Economy*, *76*(2), 169–217. https://www.jstor.org/stable/1830482

Bender, K. A., & Heywood, J. S. (2009). Educational Mismatch among PhDs: Determinants and Consequences. In R. B. Freeman & D. L. Goroff (Eds.), *Science and Engineering Careers in the United States: An analysis of markets and employment* (pp. 229–255). University of Chicago Press.

Biffl, G. (2012). *Labour market integration of low skilled migrants in Europe: Economic impact* [Paper presentation]. Conference on Managing Migration and Integration: Europe and the US, Berkley, CA, United States. https://migrationfiles.ucdavis.edu/uploads/rs/files/2012/ciip/biffl-low-skilled.pdf

Brell, C., Dustmann, C., & Preston, I. (2020). The Labor Market Integration of Refugee Migrants in High-Income Countries. *Journal of Economic Perspectives*,*34*(1), 94–121. https://www.jstor.org/stable/26873531

Brunello, G., & Wruuck, P. (2021). Skill shortages and skill mismatch: A review of the literature. *Journal of Economic Surveys*, *35*(4), 1145–1167. https://doi.org/10.1111/joes.12424

Burmann, M., Hofbauer Pérez, M., Hoffmann, V., Rhode, C., & Schworm, S. (2018). Highly Skilled Labour Migration in Europe. *ifo DICE Report*, *16*(Spring), 42–52. https://www.ifo.de/DocDL/dice-report-2018-1-onlineversion-may.pdf

Böckerman, P., & Ilmakunnas, P. (2012). The Job Satisfaction-Productivity Nexus: A Study Using Matched Survey and Register Data. *ILR Review*, *65*(2), 244–262. https://doi.org/10.1177/001979391206500203

Cabinet Office. (2018). *Annual Report on the Ageing Society: 2018(Summary)*. https://www8.cao.go.jp/kourei/english/annualreport/2018/pdf/c1-1.pdf

Cabinet Office. (n. d. a.). *The Japan's Plan for Dynamic Engagement of All Citizens*. https://japan.kantei.go.jp/content/jpnplnde_en.pdf

Cabinet Office. (n. d. b.). *Society 5.0*. https://www8.cao.go.jp/cstp/english/society5_0/index.html

Chiacchio, F., Petropoulos, G., & Pichler, D. (2018, April). *The Impact of Industrial Robots on EU Employment and Wages: A Local Labour Market Approach* (Bruegel Working Paper 02-2018). https://www.bruegel.org/sites/default/files/wp-content/uploads/2018/04/Working-Paper_02_2018.pdf

Chonlaworn, P. (2021). Cheap and Dispensable: Foreign Labor in Japan via the Technical Intern Training Program. *jsn Journal*, *11*(1), 33–49. https://doi.org/10.14456/jsnjournal.2021.3

Costa, D., & Martin, P. (2018). Temporary labor migration programs. *Economic Policy Institute*. https://www.epi.org/publication/temporary-labor-migration-programs-governance-migrant-worker-rights-and-recommendations-for-the-u-n-global-compact-for-migration/

David, B. (2017). Computer technology and probable job destructions in Japan: An evaluation. *Journal of the Japanese and International Economies*,*43*(March), 77–87. https://doi.org/10.1016/j.jjie.2017.01.001

Dawson, N., Rizoiu, M.-A., Johnston, B., & Williams, M.-A. (2020). *Predicting Skill Shortages*

in Labor Markets: A Machine Learning Approach[Paper presentation]. 2020 IEEE International Conference on Big Data. https://arxiv.org/pdf/2004.01311.pdf

DeCanio, S. J. (2016). Robots and Humans – Complements or Substitutes? *Journal of Macroeconomics*, *49*(September), 280–291. https://doi.org/10.1016/j.jmacro.2016.08.003

De Haas, H., & Fokkema, T. (2011). The Effects of Integration and Transnational Ties on International Return Migration Intentions. *Demographic Research*,*25*(December), 755–782. https://dx.doi.org/10.4054/DemRes.2011.25.24

Dekle, R. (2020). Robots and industrial labor: Evidence from Japan. *Journal of the Japanese and International Economies*, *58*(December), 101108. https://doi.org/10.1016/j.jjie.2020.101108

De Smet, A., Dowling, B., Mugayar-Baldocchi, M., & Talloen, J. (2021, December 6). The Great Attrition: Facing the Labor Shortage Conundrum.*McKinsey & Company People & Organization Blog*. https://www.mckinsey.com/capabilities/people-and-organizational-performance/our-insights/the-organization-blog/the-great-attrition-facing-the-labor-shortage-conundrum

De Vries, G. J., Gentile, E., Miroudot, S., & Wacker, K. M. (2020). The Rise of Robots and the Fall of Routine Jobs. *Labour Economics*, *66*(October), 101885. https://www.sciencedirect.com/science/article/pii/S0927537120300890

Dias, Á., Silva, J., Pereira, L., Da Costa R. L., & Gonçalves, R. (2021). Job Integration and Motivation of Foreigner Workers: a Cluster Analysis, *International Journal of Work Organisation and Emotion*, *12*(2), 129–150. https://doi.org/10.1504/IJWOE.2021.117670

Dzedzickis, A., Subačiūtė-Žemaitienė, J., Šutinys, E., Samukaitė-Bubnienė, U., & Bučinskas, V. (2022). Advanced Applications of Industrial Robotics: New Trends and Possibilities. *Applied Sciences*, *12*(1), 135.https://doi.org/10.3390/app12010135

Eder, A., Koller, W., & Mahlberg, B. (2022, March). *The Contribution of Industrial Robots to Labor Productivity Growth and Economic Convergence: A Production Frontier Approach* (MPRA Paper No. 113126). https://mpra.ub.uni-muenchen.de/113126/1/MPRA_paper_113126.pdf

Endoh, T. (2021). Immigration Easing or Restriction?: A Consideration of Japan's Foreign-Worker Acceptance Policy. *The Bulletin of the Graduate School of Josai International University*, *24*(March), 289–298.https://www.jiu.ac.jp/files/user/education/books/pdf/2020-24-018.pdf

Entzinger, H., & Biezeveld, R. (2003). Benchmarking in Immigrant Integration. *European Research Centre on Migration and Ethnic Relations*.https://www.researchgate.net/publication/251998179_Benchmarking_in_Immigrant_Integration

Esser, H. (2001). *Integration und ethnische Schichtung* (MZES Working Paper No. 40). https://www.mzes.uni-mannheim.de/publications/wp/wp-40.pdf

Fernando, Y., Mathath, A., & Ali Murshid, M. (2016). Improving Productivity: A Review of Robotic Applications in Food Industry. *International Journal of Robotics Applications and Technologies*, *4*(1), 43–62. https://doi.org/10.4018/IJRAT.2016010103

Ford, S. (2020, October 8). How Japan's Labor Trainee Program Hurts Relations with Vietnam. *The Diplomat*. https://thediplomat.com/2020/10/how-japans-labor-trainee-program-hurts-relations-with-vietnam/

Frey, C. B., & Osborne, M. (2016). The Great Escape: How Workforce Automation is the Answer to Japan's Secular Stagnation.*Oxford Martin School*. https://www.oxfordmartin.ox.ac.uk/downloads/news-items/Nikkei_Frey_Osborne_030116.pdf

Gender Equality Bureau Cabinet Office. (2019). *Women and Men in Japan*. https://www.gender.go.jp/english_contents/pr_act/pub/pamphlet/women-and-men19/pdf/2.pdf

Graetz, G., & Michaels, G. (2018). Robots at Work. *The Review of Economics and Statistics*, *100*(5), 753–768. https://doi.org/10.1162/rest_a_00754

Grau, A., Indri, M., Lo Bello, L., & Sauter, T. (2020). Robots in Industry: The Past, Present, and Future of a Growing Collaboration with Humans. *IEEE Industrial Electronics Magazine,15*(1), 50–61. https://doi.org/10.1109/MIE.2020.3008136

Guvenen, F., Kuruscu, B., Tanaka, S., &Wiczer, D. (2020). Multidimensional Skill Mismatch. *American Economic Journal: Macroeconomics*, *12*(1), 210–244. https://doi.org/10.1257/mac.20160241

Hamaguchi, K. (2019). How Have Japanese Policies Changed in Accepting Foreign Workers? *Japan Labor Issues*, *3*(14), 2–7. https://www.jil.go.jp/english/jli/documents/2019/014-01.pdf

Horbach, J., & Rammer, C. (2020, February). *Labor Shortage and Innovation* (ZEW Discussion

Paper No. 20-009). https://d-nb.info/1211327132/34

Horii, M., & Sakurai, Y. (2020, June). The Future of Work in Japan: Accelerating Automation after COVID-19. *McKinsey & Company People & Organization Blog*. https://www.mckinsey.com/~/media/mckinsey/locations/asia/japan/our%20insights/future%20of%20work%20in%20japan/the-future-of-work-in-japan_v4_en.pdf

House of Councillors. (2022). *Strength of the Political Groups in the House of Councillors*. https://www.sangiin.go.jp/japanese/joho1/kousei/eng/strength/index.htm

IFR (International Federation of Robotics). (2020). *How Nations Invest in Robotics Research*. https://ifr.org/ifr-press-releases/news/how-nations-invest-in-robotics-research

IFR (International Federation of Robotics). (2021). *Robot Race: The World's Top 10 Automated Countries*. https://ifr.org/ifr-press-releases/news/robot-race-the-worlds-top-10-automated-countries

IFR (International Federation of Robotics). (2022). *Japan is World's Number one Robot Maker*. https://ifr.org/ifr-press-releases/news/japan-is-worlds-number-one-robot-maker#:~:text=Frankfurt%2C%20Tokyo%2C%20Mar%2010%2C,136%2C069%20industrial%20robots%20were%20shipped

IPSS (National Institute of Population and Social Security Research). (2017). *Population Projections for Japan: 2015-2065*. https://www.ipss.go.jp/p-info/e/psj2017/PSJ2017.asp. Accessed 8 June 2023

ISA (Immigration Services Agency of Japan). (2022a). *Initiatives to Accept New Foreign Nationals and for the Realization of Society of Harmonious Coexistence*. https://www.moj.go.jp/isa/content/930004452.pdf

ISA (Immigration Services Agency of Japan). (2022b). *Ginōjisshūsei no shissōshasū no suii (Heisei nijyūgonen kara Reiwa yonenkamihanki)*[The Trends in the Number of Missing Technical Intern Trainees (2013 - First Half of 2022)]. https://www.moj.go.jp/isa/content/001362001.pdf

ISA (Immigration Services Agency of Japan). (2022c). *Ginōjisshūseidooyobitokuteiginōseido no genjōnitsuite* [The Current Situation of the Technical Internship System and the Specified Skilled Worker System]. https://www.moj.go.jp/isa/content/001385692.pdf

ISA (Immigration Services Agency of Japan). (2022d). *Tokuteiginōseidoshikenjisshijōhōichiran*[List of Examination Information on the Specified

Skilled Worker System].
https://www.moj.go.jp/isa/policies/ssw/nyuukokukanri01_00135.html

ISA (Immigration Services Agency of Japan). (2023). *Tokuteiginōseidounyōjōkyō*[The Status of Operation of the Specified Skilled Worker System].
https://www.moj.go.jp/isa/content/001359454.pdf

ISA (Immigration Services Agency of Japan). (n. d.). *About the Specified Skilled Worker Program*.
https://www.ssw.go.jp/en/#:~:text=Specified%20Skilled%20Worker%20is%20a,skills%20than%20type%20(i)

JICA (Japan International Cooperation Agency). (2022). *Toward an Inclusive Society Where Diverse People, Regardless of Their Nationality, Can Thrive Together: Research Outcomes Discussed at a Symposium on Foreign Worker Acceptance*. https://www.jica.go.jp/jica-ri/news/topics/20220203_02.html

JITCO (Japan International Trainee and Skilled Worker Cooperation Organization). (n. d.). *What is the Technical Intern Training Program?*https://www.jitco.or.jp/en/regulation/index.html

Jones, R. S., & Seitani, H. (2019, September). *Labour Market Reform in Japan to Cope with a Shrinking and Ageing Population* (OECD Economic Department Working Paper No. 1568). https://one.oecd.org/document/ECO/WKP(2019)37/En/pdf

Kaczmarczyk, P., Brunarska, Z., Brzozowska, A., & Kardaszewicz, K. (2020). *Economic Integration of Immigrants - Towards a New Conceptualisation of an Old Term* (CMR Working Paper No. 120/178).
https://www.econstor.eu/bitstream/10419/231797/1/WP120178.pdf

Kalimanzila Matemani, J., & Ndunguru, B. (2019). Impacts of Labour Shortage on Organization Performance: A Case Study Ministry of Water and irrigation-Tanzania. *International Journal of Economics, Business and Accounting Research (IJEBAR)*, *3*(3), 196–214. http://dx.doi.org/10.29040/ijebar.v3i03.575

Kansai International Airport. (2021). *Security Robot Secom Robot X2 to Start Patrolling at KIX Terminal 2 and Railway Station*.http://www.kansai-airports.co.jp/en/news/2021/806/E_211018_PressRelease_SecurityRobot.pdf

Kerr, S. P., Kerr, W., Özden, Ç., & Parsons, C. (2016). Global Talent Flows. *Journal of Economic Perspectives*, *30*(4), 83–106. http://dx.doi.org/10.1257/jep.30.4.83

Kitahara, S., & Shinozaki, T. (2019, September). *Do Digital Technologies Complement or Substitute for Human Labor?* (ESRI Discussion Paper Series No. 351). https://www.esri.cao.go.jp/jp/esri/archive/e_dis/e_dis351/e_dis351.pdf

Koczan, Z., Peri, G., Pinat, M., & Rozhkov, D. (2021, March). *The Impact of International Migration on Inclusive Growth: A Review* (IMF Working Paper WP/21/88). https://www.imf.org/en/Publications/WP/Issues/2021/03/19/The-Impact-of-International-Migration-on-Inclusive-Growth-A-Review-50169

Koohsari, M. J., Nakaya, T., & Oka, K. (2018). Activity-Friendly Built Environments in a Super-Aged Society, Japan: Current Challenges and toward a Research Agenda. *International Journal of Environmental Research and Public Health*,*15*(9), 2054. https://doi.org/10.3390/ijerph15092054

Krebs, S. (2006). On the Anticipation of Ethical Conflicts between Humans and Robots in Japanese Mangas. *International Review of Information Ethics*,*6*(December), 63–68. https://doi.org/10.29173/irie141

Kromann, L., Malchow-Møller, N., Skaksen, J. R., & Sørensen, A. (2020). Automation and Productivity—a Cross-Country, Cross-Industry Comparison. *Industrial and Corporate Change*, *29*(2), 265–287. http://dx.doi.org/10.1093/icc/dtz039

Kudoh, N., & Miyamoto, H. (2021, May). *Robots and Unemployment* (SDES Working Paper No. 2021-5). http://www.souken.kochi-tech.ac.jp/seido/wp/SDES-2021-5.pdf

Köllner, P. (2006). The Liberal Democratic Party at 50: Sources of Dominance and Changes in the Koizumi Era. *Social Science Japan Journal, 9*(2), 243–257. https://www.jstor.org/stable/30209541

LDP (Liberal Democratic Party of Japan). (2018). *Nippon o mamorusekinin. jidai o hirakukakugo. Jimintōsōsaisenkyonimuketaposuta- ga kansei* [The Responsibility to Protect Japan. The Determination to Pioneer the Times. Poster for LDP Presidential Election Completed]. https://www.jimin.jp/news/information/138000.html

Matsuoka, S., Kharel, M., Koto-Shimada, K., Hashimoto, M., Kiyohara, H., Iwamoto, A., Nishihara, M., & Fujita, M. (2022). Access to Health-Related Information, Health Services, and Welfare Services among South and Southeast Asian Immigrants in Japan: A Qualitative Study. *International Journal of Environment Research and Public Health*, *19*(19), 12234. https://doi.org/10.3390/ijerph191912234

McGowan, M. A., & Andrews, D. (2015, April). *Skill Mismatch and Public Policy in OECD*

Countries (OECD Economics Department Working Paper No. 1210). https://www.oecd-ilibrary.org/docserver/5js1pzw9lnwk-en.pdf?expires=1701145018&id=id&accname=guest&checksum=ABD90C8D47CDA3C7E5F7189813F843E9

McGuinness, S., & Bennett, J. (2009). Assessing the Impact of Skill Shortages on the Productivity Performance of High-Tech Firms in Northern Ireland. *Applied Economics*, *41*(6), 727–737. https://doi.org/10.1080/00036840601007450

McGuinness, S., Pouliakas, K., & Redmond, P. (2018). Skills Mismatch: Concepts, Measurement and Policy Approaches. *Journal of Economic Surveys*, *32*(4), 985–1015. https://doi.org/10.1111/joes.12254

METI (Ministry of Economy, Trade and Industry). (2014). Worksites where Humans and Robots Coexist. *METI Journal*,*11*(November), 1–8. https://www.meti.go.jp/english/publications/pdf/journal2014_11.pdf

METI (Ministry of Economy, Trade and Industry). (2016). *METI to Launch Robots for Everyone Project*. https://www.meti.go.jp/english/press/2016/0210_04.html

MHLW (Ministry of Health, Labor and Welfare). (2016). *Gaikokujinginōjisshūsei no jisshūjisshikikannitaisurukantokushidō, sōkentō no jōkyō(Heisei 28 nen)* [Status of Supervision, Guidance, and Detention of Foreign Technical Intern Trainees at Training Organizations (2016)]. https://www.mhlw.go.jp/file/04-Houdouhappyou-11202000-Roudoukijunkyoku-Kantokuka/0000174260.pdf

MHLW (Ministry of Health, Labor and Welfare). (2019). *White Paper on the Labour Economy 2019 Summary*. https://www.mhlw.go.jp/english/wp/l-economy/2019/summary.pdf

MHLW (Ministry of Health, Labor and Welfare). (2020). *Hataraku josei no jōkyō - Reiwa ninen no hataraku josei no jōkyō* [The Situation of Working Women - the Situation of Working Women in 2020]. https://www.mhlw.go.jp/bunya/koyoukintou/josei-jitsujo/dl/20-01.pdf

MHLW (Ministry of Health, Labor and Welfare). (2021). *Kōseirōdōtōkei no aramashi* [Outline of Health, Labor and Welfare Statistics].https://www.mhlw.go.jp/toukei/youran/aramashi/all.pdf

MIC (Ministry of Internal Affairs and Communications). (2020). *STATISTICAL HANDBOOK OF JAPAN 2020 STATISTICAL HANDBOOK OFJAPAN*. https://www.stat.go.jp/english/data/handbook/pdf/2020all.pdf

MOFA (Ministry of Foreign Affairs of Japan). (2020). *Strengthening Border Measures Related to Novel Coronavirus (COVID-19): Visa Restrictions*. https://www.mofa.go.jp/ca/fna/page6e_000199.html

MOFA (Ministry of Foreign Affairs of Japan). (2022). *What is the SSW?* https://www.mofa.go.jp/mofaj/ca/fna/ssw/us/overview/

Morita, L. (2015). Some Manifestations of Japanese Exclusionism. *SAGE Open*, *5*(3). https://doi.org/10.1177/2158244015600036

Nagase, Y. (2021, September 6). You can Pick up Coffee you've pre-Ordered from this Robot Kiosk in Shinbashi. *Time Out Tokyo*. https://www.timeout.com/tokyo/news/you-can-pre-order-and-pick-up-freshly-made-coffee-from-this-robot-kiosk-in-shinbashi-090621

Nakao, M. (2014). Robots in Japanese Popular Culture. In M. Funk & B. Irrgang (Eds.), *Robotics in Germany and Japan*, (pp. 112–123). Peter Lang International Academic Publishers.

Neureiter, M. (2022). The Effect of Immigrant Integration Policies on Public Immigration Attitudes: Evidence from a Survey Experiment in the United Kingdom. *International Migration Review*, *56*(4), 1040–1068. https://doi.org/10.1177/01979183211063499

OECD (Organisation for Economic Co-operation and Development). (2021). *Creating Responsive Adult Learning Opportunities in Japan*. https://www.oecd-ilibrary.org/sites/cfe1ccd2-en/index.html?itemId=/content/publication/cfe1ccd2-en

OECD (Organisation for Economic Co-operation and Development). (2022). *Fertility rates (indicator)*. https://data.oecd.org/pop/fertility-rates.htm

OSARO. (2022). *Konoike Transport and OSARO Team Up to Pilot Japan's First Fully Automated Warehouse*. https://osaro.com/press/konoiketransport-and-osaro-team-up-to-pilot-japans-first-fully-automated-warehouse

Orrenius, P. M., & Zavodny, M. (2020). Help Wanted: Employer Demand for Less-Skilled Temporary Foreign Worker Visas in an Era of Declining Unauthorized Immigration. *The Russell Sage Foundation Journal of the Social Sciences*, *6*(3), 45–67. https://doi.org/10.7758/rsf.2020.6.3.03

Parschau, C., & Hauge, J. (2020). Is Automation Stealing Manufacturing Jobs? Evidence from South Africa's Apparel Industry. *Geoforum*, *115*(October), 120–131. https://doi.org/10.1016/j.geoforum.2020.07.002

Pellizzari, M., & Fichen, A. (2017). A new measure of skill mismatch: theory and evidence from PIAAC. *IZA Journal of Labor Economics*, *6*(1), 1–30. https://doi.org/10.1186/s40172-016-0051-y

Penninx, R., & Garcés-Mascareñas, B. (2016). The Concept of Integration as an Analytical Tool and as a Policy Concept. In B. Garcés-Mascareñas & R. Penninx (Eds.), *Integration Processes and Policies in Europe* (pp. 11–19). Springer Press.

Piper, N. (2022). Temporary Labour Migration in Asia: The Transnationality-Precarity Nexus. *International Migration*, *60*(4), 38–47. https://doi.org/10.1111/imig.12982

Pollmann, M. (2020, August 7). RESOLVED: Japan has not Done Enough to Bolster Immigration. *Center for Strategic & International Studies*. https://www.csis.org/analysis/resolved-japan-has-not-done-enough-bolster-immigration

SBJ (Statistics Bureau of Japan). (2021). *Reiwa ninenkokuseichōsajinkōtōkihonshūkeikekka kara miruwagakuni no gaikokujinjinkō no jōkyō* [2020 National Census -Status of Foreigner Population in Japan According to the Results of Basic Tabulation of Human Population etc.]. https://www.stat.go.jp/info/today/pdf/180.pdf

SBJ (Statistics Bureau of Japan). (2021). *Tōkeitopikkusu No. 129 tōkei kara mitawagakuni no kōreisha 'keirō no hi' nichinandekōreisha no shūgyō* [Statistical Topics No.129 'Japan's Elderly from a Statistical Perspective: On the Occasion of 'Respect-for-Senior-Citizens Day' - Employment of the Elderly]. https://www.stat.go.jp/data/topics/topi1292.html

Schwabe, H., & Castellacci, F. (2020). Automation, Workers' Skills and Job Satisfaction. *PLOS ONE*, *15*(11). https://doi.org/10.1371/journal.pone.0242929

Shakya, P., Tanaka, M., Shibanuma, A., & Jimba, M. (2018). Nepalese Migrants in Japan: What is Holding them back in Getting Access to Healthcare? *PLOS ONE*, *13*(9). https://doi.org/10.1371/journal.pone.0203645.

Shobe, K. (2018). Productivity Driven by Job Satisfaction, Physical Work Environment, Management Support and Job Autonomy. *Business and Economics Journal*, *9*(2). http://dx.doi.org/10.4172/2151-6219.1000351

Spencer, S., & Charsley, K. (2016). Conceptualising Integration: a Framework for Empirical Research, Taking Marriage Migration as a Case Study. *Comparative Migration Studies*, *4*(1),18. https://doi.org/10.1186/s40878-016-0035-x

Statista. (2022). *Job Vacancy Rate in Selected European Countries as of 1st Quarter*

2022. https://www.statista.com/statistics/1204257/job-vacancy-rate-in-europe/

Tanaka, M.(2020). Limitations of Social Protections of Migrant Families in Japan Exposed by COVID-19: The Case of Nepalese Women. *Japan Focus: The Asia-Pacific Journal, 18*(10), 5477. https://apjjf.org/2020/18/Tanaka.html

Tao, M. (2020, July). Japanese Construction Giant to Build Massive Dam almost Entirely with Robots. *Robotics & Automation News*. https://roboticsandautomationnews.com/2020/07/24/japanese-construction-giant-to-build-massive-dam-with-robots/34428/

Terashima, K., Takenoshita, S., Miura, J., Tasaki, R., Kitazaki, M., Saegusa, R., Miyoshi, T., Uchiyama, N., Sano, S., Satake, J., Ohmura, R., Fukushima, T., Kakihara, K., Kawamura, H., & Takahashi, M. (2014). Medical Round Robot - Terapio -. *Journal of Robotics and Mechatronics*, *26*(1), 112–114. https://doi.org/10.20965/jrm.2014.p0112

Trendle, B. (2008). *Skill and Labour Shortages - Definition, Cause and Implications* (Queensland Government LMRU Working Paper No. 54). https://www.voced.edu.au/content/ngv%3A17773

Umeda, M. (2019). The Liberal Democratic Party: Its Adaptability and Predominance in Japanese Politics for 60 Years. *Asian Journal of Comparative Politics, 4*(1), 8–22. https://doi.org/10.1177/2057891118783270

Utami, P. P., Herlyna, H., Dwi Widiatna, A., Ariani, A., & Karyati, F. (2020). Job Satisfaction and Work Productivity: An Empirical Approach. *Systematic Reviews in Pharmacy*, *11*(12), 1243–1249. https://www.sysrevpharm.org/articles/job-satisfaction-and-work-productivity-an-empirical-approach.pdf

Vasile, V., Boboc, C. R., Ghiță, S. I., Băncescu, I., & Săseanu, A. S. (2020). Labor Force Shortage Analysis in Romania - Size, Impact and Measures. *Proceedings of the 14th International Conference on Applied Statistics Thailand, 2*(1), 285–295. https://sciendo.com/pdf/10.2478/icas-2021-0021

Velciu, M. (2017). Job Mismatch–Effects on Work Productivity. *SEA-Practical Application of Science*, *5*(15), 395–398. https://ideas.repec.org/a/cmj/seapas/y2017i15p395-398.html

WHO (World Health Organization). (2021). *Ageing and Health*. https://www.who.int/news-room/fact-sheets/detail/ageing-and-health

Wilson, G. (2019, November 18). Are Robots Finally Getting a Good Reputation? *Advanced*.

https://www.oneadvanced.com/news-and-opinion/are-robots-finally-getting-a-good-reputation/

Yazawa, T. (2021). *Human Rights Risks in Technical Intern Training Program*. Daiwa Institute of Research.https://www.dir.co.jp/english/research/report/analysis/20211228_022748.pdf

Yokoe, K. (2022, February 1). Japan's Harsh Border Controls on Foreigners Send Message it only Cares for Itself: Scholar. Interview by Motomi Kusakabe. *The Mainichi*. https://mainichi.jp/english/articles/20220201/p2a/00m/0na/025000c

Yoshikawa, T. (2022, January 18). Vietnamese Trainee Endured 2 Years of Physical Abuse. *The Asahi Shimbun*. https://www.asahi.com/ajw/articles/14524587

Yoshino, A., Salonga, R. B., & Higuchi, M. (2021). Associations between Social Support and Access to Healthcare among Filipino Women Living in Japan. *Nagoya Journal of Medical Science*, *83*(3), 551–565.https://doi.org/10.18999%2Fnagjms.83.3.551

Yoshino, N., & Taghizadeh-Hesary, F. (2014). *Three Arrows of "Abenomics" and the Structural Reform of Japan: Inflation Targeting Policy of the Central Bank, Fiscal Consolidation, and Growth Strategy* (ADBI Working Paper No. 492). https://www.adb.org/sites/default/files/publication/156347/adbi-wp492.pdf

Yu, H., Choi, I. S., Han, K.-L., Choi, J. Y., Chung, G., & Suh, J. (2015). Development of a Stand-Alone Powered Exoskeleton Robot Suit in Steel Manufacturing. *ISIJ International*, *55*(12), 2609–2617. https://doi.org/10.2355/isijinternational.ISIJINT-2015-272

Zou, M. (2018). Towards Exit and Voice: Redesigning Temporary Migrant Workers' Programmes. *Revue de droit comparé du travail et de la sécurité sociale*, *4*(December), 18–29. https://doi.org/10.4000/rdctss.1724