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RECRUITING CIVILIAN EXPERTISE: DEVELOPING A SKILLS-BASED HIRING MODEL FOR DIRECT ACCESSION INTO THE MILITARY

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THESIS

RECRUITING CIVILIAN EXPERTISE: DEVELOPING A SKILLS-BASED HIRING MODEL FOR DIRECT ACCESSION INTO THE MILITARY

by

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The Singapore military is exploring how to implement skills-based hiring in light of the government's emphasis and its growing adoption worldwide. This research presents a proof-of-concept methodology on how the military can employ skills-based hiring to recruit civilians with relevant skills to join its ranks as well as a novel way to quantify its merit using market data. I chose aircraft maintenance as the research subject, given that the skills for the military and civilian jobs are largely similar. Employing LinkedIn and various market data, I found that the value of skills-based hiring over traditional hiring depends on the job's context—whether it attracts the right profile of workers that the organization needs. In the study's context, skills-based hiring incentivizes younger technicians with more diverse skill sets, attracting more workers at the ME3-1 and ME3-2 ranks. Consequentially, highly skilled civilians at these ranks are accorded a higher entry rank compared to military technicians with average performance, which can create discontentment among the latter. Informed by the results, the study proposes that the military evaluate its manning and expertise gaps in deciding on the adoption of skills-based hiring and perhaps consider a hybrid model that can marry the merits of skills-based and traditional hiring practices. The methodology can also be used to quantify the value of skills-based hiring for other jobs beyond the military.

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LIST OF ACRONYMS AND ABBREVIATIONS

CT	Civilian Technician
DAF	Direct Accession Framework
FQDAF	Formal Qualification Direct Accession Framework
MDES	Military Domain Expert Scheme
ME	Military Expert
MT	Military Technician
RSAF	Republic of Singapore Air Force
SAF	Singapore Armed Forces
SAR	Singapore Airworthiness Requirements
SBDAF	Skills-Based Direct Accession Framework

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I. INTRODUCTION

A. MOTIVATION AND BACKGROUND

The Singapore military is keen to explore how skills-based hiring practices can be employed to recruit civilians with the relevant skills—particularly for non-combat vocations under the Military Domain Expertise Scheme (MDES)—in line with the government's emphasis (PMO Singapore, 2016). Established in 2009, the MDES is a uniformed scheme designed to allow Military Experts (ME) to develop deep expertise in key military domains such as engineering and intelligence (MINDEF Singapore, 2016). Currently, civilians with relevant expertise can be directly assessed[1] to a rank that commensurate with their years of work experience under the Formal Qualification Direct Accession Framework (FQDAF).

The military's interest in skills-based hiring is aligned with the national movement to encourage the labor market to put more emphasis on skills, away from the reliance on educational credentials—to better match workers to jobs. Under the movement, workers are encouraged to acquire relevant skills for the job over the blind pursuit of education; likewise, employers are urged to evaluate workers for the necessary skills rather than disproportionally emphasizing academic qualifications and prior work experience. Embracing skills-based hiring practices allows employers to broaden the pool of potential applicants, as suitable workers who might have been previously excluded due to the arbitrary imposition of educational or work credentials can now apply. This approach enables firms to hire the most suitable candidate for a position and thus, optimize long-term results, reduce costs, and enhance workforce retention and job satisfaction (Peregrin, 2014).

To bridge the mismatch between jobs and skills, the Singapore government kickstarted the SkillsFuture movement in 2014; it serves to guide the workforce's upskilling efforts to bridge the gap between job demands and worker competencies. Two

[1] In contrast to conventional military recruitment, which requires recruits to join at the entry rank and undergo various pre-requisite training (e.g., bootcamp), direct accession allows a hire to skip certain requirements and start on a higher-entry rank under specific or pre-approved conditions.

SkillsFuture initiatives stand out in the context of promoting skills-based hiring: first, it introduces the skills frameworks for the various occupations, giving workers a clear map of essential skills for different roles. Second, it works with training providers to curate short, industry-relevant courses. These initiatives reflect the government's emphasis on acquiring the skills that employers need. The relevance of the skills framework is demonstrated in the methodology section, as it simplifies the process of comprehending the skills landscape of civilian jobs.

In recent years, the military has been exploring ways to attract civilians with the relevant expertise for the various MDES roles to fill manpower gaps and to tap into their civilian expertise to enrich the body of knowledge and best practices within the military job. The theoretical benefits of skills-based hiring are equally pertinent to the military context: it expands the pool of potential candidates, ensures a closer match between a worker's skills and the job's requirements, and fosters equity and inclusivity.

However, beyond these broad statements of benefit, the quantitative impact of skills-based hiring on recruitment remains ambiguous. Fundamentally, there is no mechanism to translate civilians' skills to a commensurate rank in the military, which is needed to initiate the analysis to quantify its pros and cons. The problem is that nebulous descriptions of benefits are insufficient to promote a meaningful policy discussion on the adoption of skills-based hiring. A more precise quantification of the benefits and trade-offs, in terms of the potential to address the military's manpower needs, is needed to support the case for skills-based hiring.

B. RESEARCH QUESTIONS

This study answers the following question: is skills-based hiring viable in the context of hiring civilians with the relevant expertise for the Singapore military? This is addressed in two parts. First, I show how skills-based hiring practices can work by constructing a framework that facilitates the skills comparison between civilian and military jobs. The framework provides the basis to translate workers' skills to a commensurate rank in the military and is termed the Skills-Based Direct Accession Framework (SBDAF). Next, I employ various sources of market data—mainly from

LinkedIn and online job portals—to assess the value of SBDAF against FQDAF in terms of the likelihood of attracting civilians, the profile of hire, as well as any potential implications for manpower management.

C. RELATION TO EXISTING LITERATURE

This section summarizes the literature review from chapter 2 to enable readers to better appreciate the subsequent content that follows in this chapter.

Skills-based hiring practices are gaining traction among employers globally. Various surveys have shown that employers who use skills-based hiring practices have recruited more suitable candidates, resulting in higher job satisfaction, retention, and reduced training costs for employers. Besides employers' recognition of its benefits, technological advancement has contributed to the growth of skills-based hiring by expanding the means and ease of assessing candidates. Increasingly, employers realized that educational credentials are useful to the extent that they are relevant to the job. Consequentially, employers view skills-based hiring and educational credentials as complementary to an effective recruitment and retention strategy—to find the best match of workers for the job. However, the skills-based hiring paradigm, as it is implemented now, is insufficient to unlock the full benefits of skills-based hiring as it is difficult to create a common skills framework to facilitate the comparison of credentials across the workforce and the extensive effort required to transform the hiring process. While various literature has concurred on the broad benefits of skills-based hiring, these sources have neither quantified its value nor contrasted it against conventional hiring practices.

My contribution to the literature is twofold. First, I demonstrate how the military can use skills-based hiring to recruit civilians with the right skills to perform similar military jobs. Second, I propose a novel proof-of-concept methodology to quantify the value of the skills-based hiring approach by using market data, which is also applicable outside the military's context.

D. DATA AND METHODOLOGY

I used a three-step methodology to address the research question. First, I chose the aircraft maintenance job as the research subject as the job exists in both the military and civilian context and shares largely similar skillsets. Next, I aligned the skills of civilian aviation technicians (CT) to those of military aviation technicians (MT) that are undertaken by the various ranks to create the SBDAF. Finally, I used various market data to analyze the frameworks in terms of the profile of hires that the SBDAF incentivizes (CT's perspective), the propensity of SBDAF at solving manpower needs at the various ranks (Military's perspective), as well as the scenario where MT may be discontented at the prospect that CT starts at a higher entry rank than them—having spent many years with the military only to be outranked by civilians with no track record in the military (MT's perspective). This phenomenon is referred to as the "leapfrogging" problem.

The analysis is largely conducted by analyzing a sample of 100 CT LinkedIn profiles—noting their years of work experience and skills— that represent potential hires for the military, of which the military can only tap on 34 citizen CT as the military cannot hire foreign workers due to security guidelines. First, the profile of hire is assessed by comparing the entry rank that each CT receives under each DAF; the CT who receives a higher rank under SBDAF will be incentivized to join. Second, the propensity of SBDAF to solve manpower needs is assessed by comparing the distribution of entry ranks, assuming all 34 CTs are to join the military. Each DAF concentrates CTs at different ranks depending on the attributes of the sample; the more useful DAF will then depend on the military's manpower needs. Third, the leapfrogging problem is assessed by checking for CT who receives an entry rank that is way ahead of the time norm for a given rank. For instance, it is a red flag if it typically takes 20 years of work experience to obtain ME3-2 but only 12 years for a skilled worker under SBDAF.

Assessing the likelihood of CTs joining the military needs to involve examining market factors, as they are only concerned about getting a higher pay in the military and not the employed DAF (i.e., getting a higher rank means nothing if the pay is lower). I assess this by comparing the MT and CT pay obtained from online job portals.

I supplemented the wage data by analyzing MT's attrition patterns and job listings to form a more holistic picture of the hiring landscape. I compiled 50 LinkedIn profiles to understand the attrition pattern and career aspirations of former MTs. A pattern of MT leaving to join CT—with comparable job scope—suggests that the value proposition of the aviation maintenance job is swinging in favor of CT, which erodes the appeal of the military. I assembled 30 job listings from various online job portals at the time of my research to analyze the seniorities of CTs that firms are hiring. When analyzed together with wage data, these demand signals reflect the state of the labor market for CT and the likelihood that the military can attract them.

E. RESULTS

The SBDAF places more CTs at the ME3-1 and ME3-2 ranks (warrant officers equivalent), which is beneficial if the military faces a manpower shortfall at these ranks. At these ranks, the SBDAF is starting these CTs for significantly less years of work experience as compared to the time norm, which presents the issue of leapfrogging. The SBDAF also accords a more favorable rank for younger civilians with more diverse skill sets which incentivizes this group to join.

Market data shows that CTs are being paid higher than MTs from the 10th year onwards. As such, those with 10 or more years of experience are unlikely to join under FQDAF whereas skilled CTs benefitting from a higher rank under SBDAF get a higher pay and are therefore still attracted to join the military.

Similar to FQDAF, one downside to the SBDAF is that it does not consider workers' depth of expertise (i.e., it does not distinguish between workers with different proficiencies for a given skill)—though workers' skills are easily differentiated by imposing structured interviews.

F. RECOMMENDATIONS AND CONCLUSIONS

I conclude that the more appropriate DAF depends on the job's context, which needs to consider manpower needs, the desired profiles of candidates, the nature of the job's skillsets, and the extent of leapfrogging issue.

Specific to the aircraft maintenance job, I recommend that the military study its manpower needs in deciding on the more suitable DAF. As the SBDAF and FQDAF are two disparate mechanisms, the military may want to consider a hybrid DAF that marries the strength of FQDAF and SBDAF. The military should also consider policies that are aimed at ensuring that CTs succeed at the ranks that they are recruited for to mitigate the leapfrogging problem, as well as integrating these CT hires—or risk losing them.

The value of the proposed methodology extends to other jobs outside of the military, premised on whether a skills framework to facilitate the comparison of skills can be constructed.

G. ORGANIZATION OF THE STUDY

Following the introduction, the thesis contains five chapters. Chapter II provides a review of existing literature relating to skills-based hiring practices. Chapter III provides the institutional background of the relevant elements from the Singapore military to allow readers to appreciate the nuances of the study. Chapter IV elaborates on the data and methodology employed in the study. Chapter V lists the results and their implications. Finally, Chapter VI covers the policy discussion and conclusion.

II. LITERATURE REVIEW

The literature review is divided into four parts. It begins by clarifying the difference between competency-based and skills-based hiring practices; I chose to focus on skills as its definition is more pertinent for my research scope. Next, it provides an overview that covers what constitutes skills-based hiring, the concerns with traditional hiring practices, and the ways in which skills-based hiring practices differ from traditional methods, along with their advantages and challenges. Then it looks for insights on how skills-based hiring can be implemented, and on how to systematically quantify the merits of skills-based hiring over traditional hiring practices. Finally, it addresses the impetus for embracing skills-based hiring in the context of Singapore and outlines my contribution to the literature.

A. OVERVIEW OF SKILLS-BASED HIRING

Competency-based or skills-based hiring is described differently in various literature. Fundamentally, the hiring process emphasizes the worker's skills and attributes that are pertinent and beneficial for the job in question. This approach contrasts with traditional hiring practices that primarily consider educational credentials and prior work experience (Baker, 2011 as cited in Gallagher, 2018). According to Northwestern University in Chicago, Illinois, competency-based hiring encompasses three key elements: Knowledge, Skills, and Abilities. Under their definitions, "Skills" are defined as the specific abilities required to perform job responsibilities, including proficiency in various software, interpersonal communication, accounting skills, or specialized laboratory techniques. "Knowledge" pertains to the employee's area of expertise, such as in fields like nursing, finance, employment law, or history. Lastly, "Behavior" is about the personal qualities necessary for the role, which could include traits like taking initiative, working well with colleagues, being resourceful, and maintaining professionalism. From the definition, it is clear that skills is a subset of competency. I opt to use the term "skills-based hiring" given the research's focus on skills.

According to Peregrin (2014), the skills-based approach allows the employer to widen the pool of potential candidates; workers possessing the requisite skills, previously

excluded due to the arbitrarily imposed educational credentials requirement, can now be considered. Such an approach allows firms to select the most fitting candidate for a role, which can lead to improved long-term outcomes, reduced costs, and increased employee retention and job satisfaction (Peregrin, 2014).

Skills-based hiring, which encompasses various activities designed to assess a worker's skills, provides employers with credible alternatives to traditional indicators like educational credentials and prior work experience. Common methods include skills-based job advertisements (which emphasize the required skills and attributes needed for the job), pre-hiring assessments, and structured interviews. Technological advancements have broadened and simplified the means for employers to evaluate workers' skills. Some of these methods include gamified assessments, resume filtering, social media scraping, talent analytics, online simulations, virtual reality (Wilson, Kurzweil, & Alamuddin, 2018), and even cognitive profiling (Kantar, McNulty, Snow et al., 2018). Riding on these new methods, companies are increasingly investing in both in-house and third-party assessment solutions. The talent acquisition service market was valued at approximately $113.9 billion in 2021 and is set to grow further. These evolving approaches enable employers to shift away from conventional hiring practices that heavily rely on previous work experience and educational credentials (Wilson et al., 2018).

Besides technology, other factors have contributed to employers exploring other screening criteria beyond just educational credentials like degree, such as the intensely competitive talent market, the rise of alternative upskilling opportunities through short courses and micro-credentials, and the growing number of degree graduates (Gallagher, 2018).

The primary concern regarding the use of educational credentials in hiring is the extent of its effectiveness as a tool for evaluating a candidate's suitability for a position, in light of employers' difficulty in finding suitable workers. A previous study by Gallup (2014) has highlighted the disparity between how employers and educational institutions view the adequacy of workers' skill development. The study revealed that a mere 11% of business leaders strongly agreed that graduates have the necessary skills for their industries. In contrast, 97% of chief academic officers believed that their institutions effectively equip

students for the professional world (Gallup, 2014, as cited in Butrica & Mudrazija, 2022). More recently, the Global Skills Shortage 2019 report by the Society of Human Resource Management reinforced this trend. It showed that among employers who experienced recruitment difficulties, 75% attributed these challenges to a skills shortage in the applicant pool despite the increasing proportion of graduates in the workforce. When probed about potential solutions to this skills gap, 51% expressed that the education system has not sufficiently addressed the skills deficit. Drawing from open-ended responses, HR professionals conveyed that, generally, the education system falls short in cultivating specific skills employers deem crucial, notably in areas of critical thinking, lifelong learning, and professionalism (Burner et al. 2019).

Studies have pointed to the rapid pace of technological advancement as the key factor to the skills mismatch observed in modern labor market trends. Butrica and Mudrazija (2022) conducted interviews with assessment and training providers; they attributed technological advancement as the cause—the pace of automation and acceleration. The former is because repetitive skills, commonly associated with low-wage workers, are becoming automated and hence redundant; the latter is due to colleges' inability to frequently update their curriculum in tandem with the rapid pace of technological changes. Autor (2015) provides a more nuanced understanding of automation's impact on the job market. The study revealed that the job growth was concentrated in the high- and low-skilled sectors because the nature of their tasks was notoriously difficult to automate—the former demands non-routine "abstract" tasks requiring advanced analytics; the latter demands non-routine "manual" tasks requiring adaptability. This shift contributed to a decline in mid-level jobs, a phenomenon known as "job polarization," observed in the U.S. and across EU economies (Goos & Manning, 2007).

Despite the growing skills mismatch, educational credentials remain an important component of an overall effective hiring strategy, provided that the education is relevant to the job and is not imposed arbitrarily without due consideration. When coupled with skills-based hiring practice, it allows employers to maximize the chance of finding the best fit for a position. According to a 2018 national research survey involving 750 HR leaders,

which approximates the U.S. job market, the relative importance of educational credentials in hiring has either remained steady or increased for most employers over the past five years. At the same time, employers view skills-based hiring favorably. The survey indicates that 23% of organizations have made a formal effort to implement skills-based hiring, and another 39% are considering its adoption (Gallagher, 2018). While these trends may seem contradictory in light of criticisms of educational credentials, they underscore employers' ongoing and intensifying search for qualified workers. Employers increasingly recognize the importance of educational qualifications when they reflect the up-to-date skills needed for effective job performance (Butrica & Mudrazija, 2022).

Following this realization, various companies have announced their commitment to eliminate degree prerequisites for jobs that did not previously require a degree—a phenomenon referred to as "degree inflation" (Fuller & Raman, 2017). In response, Fuller, Langer, and Sigelman (2022) collaborated with Emsi Burning Glass—a leading labor market data firm—to examine whether companies have acted on their intentions to remove such degree requirements and how Covid-19 has influenced these trends. By analyzing 51 million job postings from 2017 to 2020, the study found that employers reduced their demands for degrees for middle- and high-skill jobs by 46% and 31% respectively. While the reversion is more pronounced during Covid-19, some of these changes predate the pandemic, which suggests a lasting shift in employment strategies. The most pronounced effect of degree reversion is observed in middle-skilled jobs, which is unsurprising given that this category has been most affected by degree inflation since it gained traction in 2015. (Fuller et al., 2017). IT and managerial roles, which were difficult to fill during the period, saw the greatest impact on degree reversion (Fuller, Langer, & Sigelman, 2022).

The study observed that when degree requirements were removed from job postings, there was a marked increase in the demand for soft and social skills, suggesting that companies had used degrees as a proxy for these skills. These skills range from those that can be more straightforwardly evaluated, such as written and oral communication, to those that are more intangible, like commitment and the ability to effectively participate in unfamiliar groups. The author believes that this confirms the idea that for many employers, a degree primarily acts as a reliable indicator of the quality of social skills often associated

with graduates. Additionally, the study highlighted that the majority of job listings are now more deliberate in specifying the necessary knowledge, skills, and abilities (KSAs) for a given position. Companies have started to articulate these requirements more clearly in their job postings. This increased clarity not only draws the appropriate candidates but also indicates a movement towards a more skills-centric hiring approach (Fuller, Langer, & Sigelman, 2022).

Besides the need to find skilled workers, there are also equity concerns with traditional hiring practices. It can arise when suitably skilled applicants are screened out due to the arbitrary imposition of educational qualifications (TestGorilla, 2022). De-emphasizing degrees can also promote equity and inclusion in the workplace, considering the correlation between wealth and educational attainment (Braga, McKernan, Ratcliffe et al., 2017). The process is also subjected to hiring biases, where recruiters and hiring managers unconsciously favor candidates with certain profiles, such as familiar backgrounds, education, and work experiences. These issues are further compounded by an over-reliance on resumes, which may be outdated, embellished, or simply untrue (TestGorilla, 2022).

B. CHALLENGES TO IMPLEMENTING SKILLS-BASED HIRING

Though the interest in skills-based hiring practices has grown (Gallagher 2018; TestGorilla, 2022), its implementation is hindered by the effort needed to change well-established business processes (Gallagher, 2018; Butrica & Mudrazija, 2022). It is also unclear if such changes justify the investments (Gallagher, 2018).

At the firm level, firms need to overhaul their hiring practices (Butrica & Mudrazija, 2022). This process is more labor-intensive, demanding meticulous effort to identify, market the necessary skillsets, and evaluate shortlisted candidates (Singh & Pathak, 2018, as cited in Butrica & Mudrazija, 2022). It becomes necessary for the HR team and the hiring manager to collaborate closely to pinpoint the required competencies for a specific role and devise an effective assessment methodology. Additionally, assessing a vast pool of applicants poses challenges, though technology is gradually simplifying this process. Interviewing for skills is also more challenging as hiring managers need to be

more thoughtful in crafting their questions. Given the extra effort, smaller employers may find it challenging to upgrade their HR department to implement skills-based hiring practices.

At the industry level, there needs to be a method for employers to compare skills credentials. Employers need a well-defined framework to facilitate the assessment of the various credentials and discern how these credentials align with the competencies vital for their job roles (Butrica & Mudrazija, 2022). Compounding this problem is the fact that many educational intermediaries that grant skills-based credentials do not maintain the same level of oversight and quality as traditional institutions like colleges and universities (Brown & Kurzweil, 2017).

These challenges have prevented skills-based hiring from being implemented to its full extent; consequently, many employers have adopted only limited elements of skills-based hiring, such as changing their job advertisements or adjusting their candidate screening methods (Butrica & Mudrazija, 2022). The State of Skills-based Hiring 2022 report by TestGorilla notes an uptick in the use of their pre-hiring assessment services (TestGorilla, 2022), an expected trend given that the company specializes in providing talent assessment tools.

There is little literature that methodologically details the methods and benefits of shifting to a skills-based paradigm. The process of the University of Arizona (UA) libraries' decade-long transformation to a competency-based framework provides some insights into the implementation of skills-based hiring. The UA libraries embarked on this ambitious shift that spans over 15 years; this shift subsequently transformed their hiring and performance evaluation processes. The transition began by defining a comprehensive set of competencies, curated from observations of successful incumbents and external references. These competencies then informed the language used in job postings and the criteria for applicant screening. The study noted that competency-driven job descriptions drew a more robust set of candidates, producing resumes that were better aligned with the role's demands. This exercise allows interviewers to better assess the skills of the candidate and therefore improve the job fit (Huff-Eibl et al., 2011). The article provides useful

insights into the process of shifting to a skills-based hiring paradigm. However, it does not offer an empirical method for quantifying the value of skills-based hiring.

A recent study by Butrica and Mudrazija (2022) investigated the impact of the skills-based hiring paradigm on older workers. The study employed a mixed-method approach; the authors conducted semi-structured phone interviews with various stakeholders (older workers, training providers, employers, and talent consultants) and reviewed academic, governmental, and industry documents. Their findings suggest that a skills-based hiring paradigm can help reduce age-related bias in hiring and in the workplace, as well as help lower-income older workers overcome challenges arising from the lack of a traditional degree. To unlock these benefits, the skills-based hiring paradigm must extend beyond its current implementation, necessitating a series of changes. Also, they might not receive equal opportunities for on-the-job or tailored training. This is often attributed to the presumption that training older workers incurs higher costs compared to their younger counterparts (Butrica & Mudrazija, 2022). As with other studies on skills-based hiring, the study does not quantify the potential benefits for older workers.

C. SKILLS-BASED HIRING IN THE SINGAPORE'S CONTEXT

The Singapore government encourages workers to pursue academic advancement only when it aligns with job relevance, as opposed to succumbing to societal pressures emphasizing the necessity of a degree. The Prime Minister of Singapore signaled this shift in emphasis during his National Day Rally 2014 speech *"Do not go on a paper chase for qualifications or degrees, especially if they are not relevant because pathways and opportunities to upgrade and to get better qualifications will remain open throughout your career"* (PMO Singapore, 2014).

Likewise in Singapore, the shift in emphasis was in response to the growing mismatch between the skills that workers possessed and the skills that employers need, despite the strong growth in the proportion of Singaporeans with degrees. Figure 1's census data reveals that for residents aged 25 and above, the proportion of degree graduates has jumped by 9 percentage points from 23.7% in 2010 to 33% in 2020, which now constitutes the largest education profile demographic (Ong, 2020).

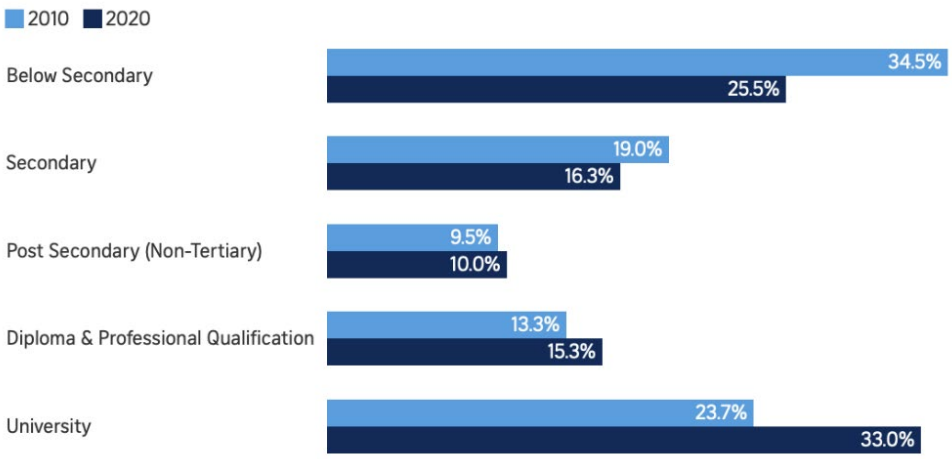

Figure 1. Resident Population Aged 25 Years and Older by Highest Qualification Attained. Source: Ong (2020).

Another data point to suggest the strong emphasis on degree is shown in an informal 2019 YouGov survey of 646 Singaporean graduates. It shows that over half do not work in their field of study and over 99% of the participants deemed a degree crucial. Notably, 1 in 7 are unwilling to employ a worker without a degree (Ho, 2019). While the findings cannot be generalized to all graduates, they reflect the strong emphasis on having a degree.

However, this academic pursuit does not translate into the skillsets that employers need. According to the Talent Shortage 2018 survey which polls 360 Singaporean employers, 56% cited difficulties in filling the jobs. Within this group, nearly a third attributed it to the lack of skilled workers, 22% was due to salary expectations, and 22% was due to a shortage of applicants (ManpowerGroup, 2018). Therefore, the government believes that increasing the emphasis on skills will go some way to bridge the skills mismatch and allow the Singapore workforce to better meet employers' needs.

D. LITERATURE GAP AND ASSESSED CONTRIBUTIONS

As demonstrated, there is scant literature addressing the transition to skills-based hiring, and a gap in the literature that methodologically measures the impact of the transition to skills-based hiring for the firms or workers.

My contribution to the literature is twofold. First, I demonstrate how the military can employ skills-based hiring to recruit civilians with the right skills to perform similar military jobs. Second, I propose a proof-of-concept methodology to quantify the benefits of transitioning to a skills-based hiring approach by employing market data, which can also be applied outside of the military's context.

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III. INSTITUTIONAL BACKGROUND

For readers who are not from the Singapore military, this section is intended to provide the necessary background to better understand the nuances of this research. First, I explain the reasons for establishing MDES, how it relates to the traditional military ranks, and why it is suited to assimilate civilian workers. Second, I outline the military's compensation structure which is needed to understand FQDAF's mechanism. Third, I illustrate how FQDAF works, which is needed to understand how SBDAF compares against FQDAF.

A. INCEPTION OF MDES

Before 2010, the Singapore military operates a two-scheme rank construct comprising the Officers and the Warrant Officers & Specialists (WOSPEC[2]) scheme. The WOSPEC Corp, along with the conscripted force, forms the backbone of the military. The military recognizes that the various combat and smart systems that accompany an increasingly modernized armed force are growing in complexity. To effectively operate these systems, the operators need to develop a deep understanding and expertise in their systems.

While the two-scheme construct has served the military well over the years, it falls short in two areas relating to the development of expertise. First, there is no incentive for operators to deepen their expertise since compensation is tied to rank progression, not expertise. Though an operator with more knowledge enjoys faster promotion, a more direct link between expertise and compensation is preferred since rank promotion is laden with other requirements such as military leadership, discipline, and completing pre-requisite courses. Second, there is no logic to justify a civilian's direct accession into the military since it is onerous to secure promotion. Third, warrant officers cannot easily be promoted to officer grade despite having the expertise to perform those roles.

[2] Known as non-commissioned officers in other militaries.

To overcome the limitations, the MDES scheme is created—a unique military HR scheme that can better promote the development of expertise. First, rank progression is more closely tied to one's expertise and therefore does not constrain the maximum rank that can be attained. This rank continuity permits a WOSPEC-grade member to crossover to officer grade should he acquire the necessary expertise, thus providing the incentive to upskill, as illustrated in Table 1. Second, MDES—with its expertise theme—is intended to be more attractive to civilians, as well as easier for the military to justify their direct accession, leading to the creation of FQDAF.

Table 1. Rank Continuity under MDES

<table>
<tr><th>Grade</th><th>WOSPEC</th><th>Officers</th><th>MDES</th></tr>
<tr><td rowspan="3">Officer-Grade</td><td rowspan="2">-</td><td colspan="2">Senior Officer Rank</td></tr>
<tr><td>LTC</td><td>ME6</td></tr>
<tr><td>CWO*</td><td>MAJ</td><td>ME5</td></tr>
<tr><td>SWO*</td><td>2LT / LTA / CPT</td><td>ME4</td></tr>
<tr><td rowspan="10">Non-Officer Grade</td><td>MWO*</td><td rowspan="10">-</td><td rowspan="3">ME3</td></tr>
<tr><td>1WO*</td></tr>
<tr><td>2WO*</td></tr>
<tr><td>3WO*</td><td rowspan="3">ME2</td></tr>
<tr><td>MSG</td></tr>
<tr><td>SSG</td></tr>
<tr><td>1SG</td><td rowspan="3">ME1</td></tr>
<tr><td>2SG</td></tr>
<tr><td>3SG</td></tr>
</table>

Note: *Denotes non-commissioned officer (NCO). The full acronyms of the listed ranks can be found on: https://www.mindef.gov.sg/web/portal/mindef/about-us/saf-rank-insignias.

Most MDES vocations require skillsets that are commonly found in the civilian sector which lends themselves well to assimilating civilians with the right expertise; Table 2 lists the MDES vocations with comparable civilian occupations.

Table 2. MDES Vocations with Comparable Civilian Occupations

Service	MDES Vocations	Comparable Civilian Occupations
Army	Army Engineers	Civil, Mechanical Engineers
	Military Band	Musicians
	Military Medical Expert (MME)	Nurses, Paramedic
Navy	Naval Warfare System Engineers	Marine Technicians, Engineers
Air Force	Air Force Technician	Aircraft Technician
	Air Force Engineers	Aircraft Engineers
Digital and Intelligence Service	C4 Experts	Cyber and Digital operators

B. MILITARY COMPENSATION STRUCTURE

Figure 2 illustrates the simplified compensation structure for the MDES scheme. Since the military does not disclose the norms for promotion timeline, or salary details (except for the entry rank), the horizontal axis reflects my postulation on the promotion timeline for an average performing personnel in the military. The vertical axis shows the starting pay for ME1, and the maximum pay for ME4,[3] as sourced from the Republic of Singapore Air Force (RSAF) career portal, corresponding to the first and 35th years of military service. Due the lack of military pay data, it is assumed that the pay increases linearly by $98 for each year of military service.

[3] The ME4 is an entry rank for officers under the MDES scheme.

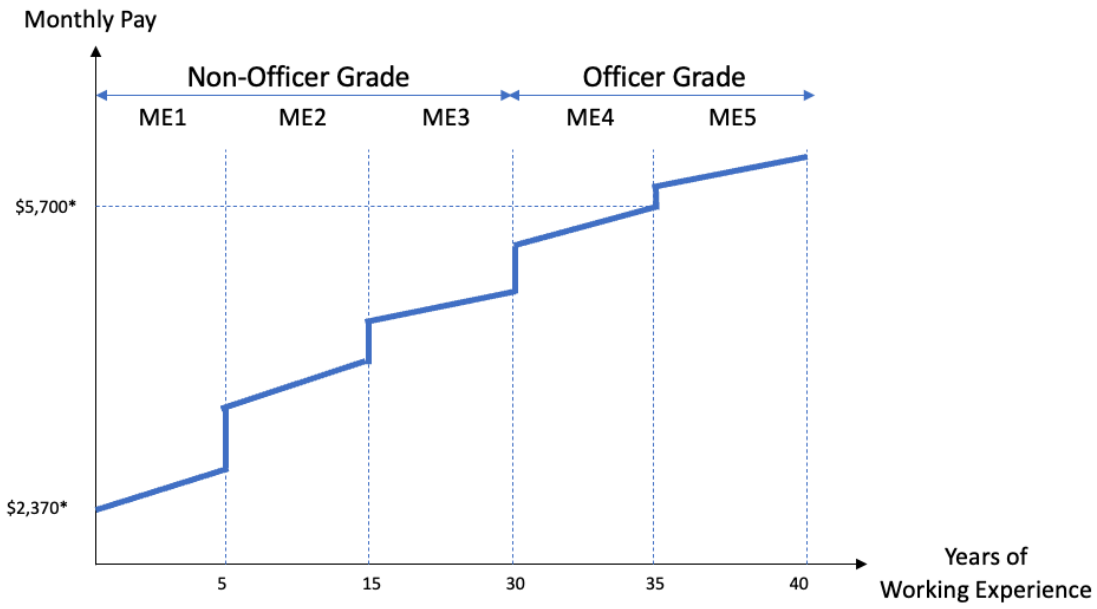


Figure 2. Simplified Compensation Structure for Air Force Technicians. Source: RSAF Career Portal.

The compensation structure operates on a time-in-grade promotion system that requires service members to serve a minimum of years to qualify for promotion. The progression, in terms of years of service, approximates the promotion time norm of personnel with average performance in the military. For example, it takes an average performer 15 years to attain ME3 while a relatively better performer requires less time. Each rank is subdivided into sub-grades; it is intended to convey the sense of career progression amongst members, as shown in Table 3.

Table 3. Rank Progression and Corresponding Years of Service for an Average Performer

Rank	Grade	Years of Service
ME3	ME3-3	> 24 & ≤ 30
	ME3-2	> 19 & ≤ 24
	ME3-1	> 14 & ≤ 19
ME2	ME2-2	> 9 & ≤ 14
	ME2-1	> 4 & ≤ 9
ME1	ME1-2	≤ 4
	ME1-1	1-2

Note: My postulated promotion time norms for an average performer as the military does not disclose promotion data.

C. THE WORKINGS OF FQDAF

Following the creation of MDES, the FQDAF was created to translate a civilian's degree credentials (for officer-grade jobs only) and years of work experience to a commensurate rank for the purpose of direct accession. One year of relevant work experience equates to one year of service in the military in computing the military rank. Table 4 shows the workings of FQDAF using two LinkedIn CT profiles, assuming that they apply to join MT. The job title and company are masked with fictitious labels for data protection. The asterisk denotes the years of work experience that are relevant to the role of MT. As seen, person A and person B receive ME2-1 and ME2-2 respectively under FQDAF.

Table 4. FQDAF Applied on LinkedIn Candidates

Person A		Person B	
Job Title/Company	Number of Years	Job title/Company	Number of Years
Process Technician at OilWorks **Aircraft Maintenance Technician** at QC Aviation	4.5 years 5 years*	**Aircraft Technician** at QC Aviation **Office Administrator** at QC Aviation **Baggage Officer** at BaggingWorld	10 years* 1 year 5 years
Total Considered Experience	5 years		10 years
Proposed Rank	ME2-1		ME2-2

Note: Asterisk denotes the recognized years of work experience.

IV. METHODOLOGY AND DATA

With scarce literature on how skills-based practices can be applied, my starting point is guided by Butrica and Mudrazija (2022) that having a well-defined skills framework is crucial for analyzing and comparing credentials. Thus, my concept of how skills-based hiring can work for the military is premised on the idea that civilian who possesses skillset analogous to those required at a certain rank provides the basis to be directly accessed at that rank. This is sensible as it means that the civilian has a higher probability of performing the job at the rank better than someone who comes in on the consideration of years of experience. This concept is known as the SBDAF. Thus, the SBDAF outlines the criteria needed to be directly accessed to the corresponding ranks in terms of the needed skills—see Table 5. The process of determining the criteria for equating civilian expertise to the corresponding military rank is referred to as "skills mapping."

Table 5. Illustration of the SBDAF

MDES Ranks	Military Skills	Civilian Skills
ME3	Skills 1 Skills 2	Analogous Skills 1 Analogous Skills 2
ME2	Skills X Skills Y	Analogous Skills X Analogous Skills Y
ME1	Skills A Skills B	Analogous Skills A Analogous Skills B

Once the SBDAF is established, I will compare it against the FQDAF using market data. Therefore, I propose a three-step methodology to address the research question:

1. Step I: Select a suitable MDES vocation for the case study.
2. Step II: Construct a SBDAF for the chosen vocation through skills mapping.
3. Step III: Compare and contrast SBDAF and FQDAF using market data to assess the relative merits of each framework.

A. STEP I: SELECT A SUITABLE VOCATION

I originally intended to choose the cyber or digital job as my research subject due to the military's need for personnel in these emerging fields and the prevalence of skills-based hiring practices in these industries. However, the classified nature of their work hindered my effort to collect data on their skill sets. Subsequently, I devise three criteria to guide my selection of a suitable job; the criteria are intended to ease the process of skills mapping process. First, the job scope is not classified. Second, the skills between the military and civilian equivalent jobs are largely similar, which provides the basis for direct accession. Third, there is an industry skills roadmap for the civilian job, which is reflective of candidates' skills that are found in resumes. This information can be obtained on the SkillsFuture website.

Table 6 summarizes how each job measures up against the proposed criteria. I chose the aircraft maintenance job as it fulfills all the proposed criteria.

Table 6. Evaluation of MDES Jobs against Proposed Criteria

MDES Vocations	**Comparable Civilian Occupations**	**Criterion 1 Access Military Skillsets**	**Criterion 2 Industry Skills Roadmap**	**Criterion 3 Similar Skillsets**
Army Engineers	Civil, Mechanical Engineers	No	Yes	N/A
Military Band	Musicians	Yes	No	N/A
Military Medical Expert (MME)	Nurses, Paramedic	Yes	No	N/A
Naval Warfare System Engineers	Marine Technicians, Engineers	Yes	No	N/A
Air Force Technician	Aircraft Technician	Yes	Yes	Yes
Air Force Engineers	Aircraft Engineers	Yes	Yes	No
Command, Control, Communications, Computer(C4) Experts	Cyber and Digital Operators	No	No	N/A

B. STEP II: CONSTRUCT A SBDAF FOR THE CHOSEN VOCATION

Comparing MT and CT jobs reveals that the nature of their work is largely similar, and their skill progression scales similarly—apart from elements specific to the military. The similarity in the skills and their progression provides the basis for the skills mapping. Refer to Table 7 for the comparison.

Table 7. Summary of Comparison

	Similarities	Differences
Tasks	• Preventive Maintenance • Corrective Maintenance • Inspections & Documentations • Safety & Compliance • Equipment & Tool Maintenance • Safety & FOD Prevention	MT only • Regimentation & Discipline • Overseas Deployment • Job Rotation (including staff appointments) • Military Liaison • Contingency Operations
Systems	• Avionics • Power & Propulsion • Flight Control • Environmental Control • Landing Gear • Hydraulic	MT only • Weapon System • Tactical Data Link • Countermeasures & Defensive Systems • Flight Suits & Life Support • Ejection Seats
Air Platforms	-	MT only • Military platforms (e.g., C130, F16) CT only • Airliner (e.g., B737, A330)
Skills Progression	Tiered Skills Progression: **Individual Skills:** • Level* 1: Perform work under supervision. • Level 2: Sign off work completion for simple tasks. • Level 3: Sign off work completion for increasingly more complex tasks. • Level 4: Sign off on the platform's airworthiness.	MT only **Military-Specific Skills:** • Military Leadership • Mission Planning and Support • Regimentation & Discipline • Operational Readiness • Exigency duties

	Similarities	Differences
	Higher Order Skills: • Level 5A (Team Leader): Lead and manage a team to accomplish maintenance work (Leadership track) • Level 5B (Technical Leader): Provides technical assessment and recommendations. *The levels allow readers to easily understand the skills progression. It does not exist in the industry.	

Next, I assess how these skills are associated with the various roles that are undertaken by CT and MT. Figure 3 shows the simplified career ladder for CT, which is obtained from SkillsFuture. Subsequently, I aligned the skills to the corresponding ranks as shown in Table 8.

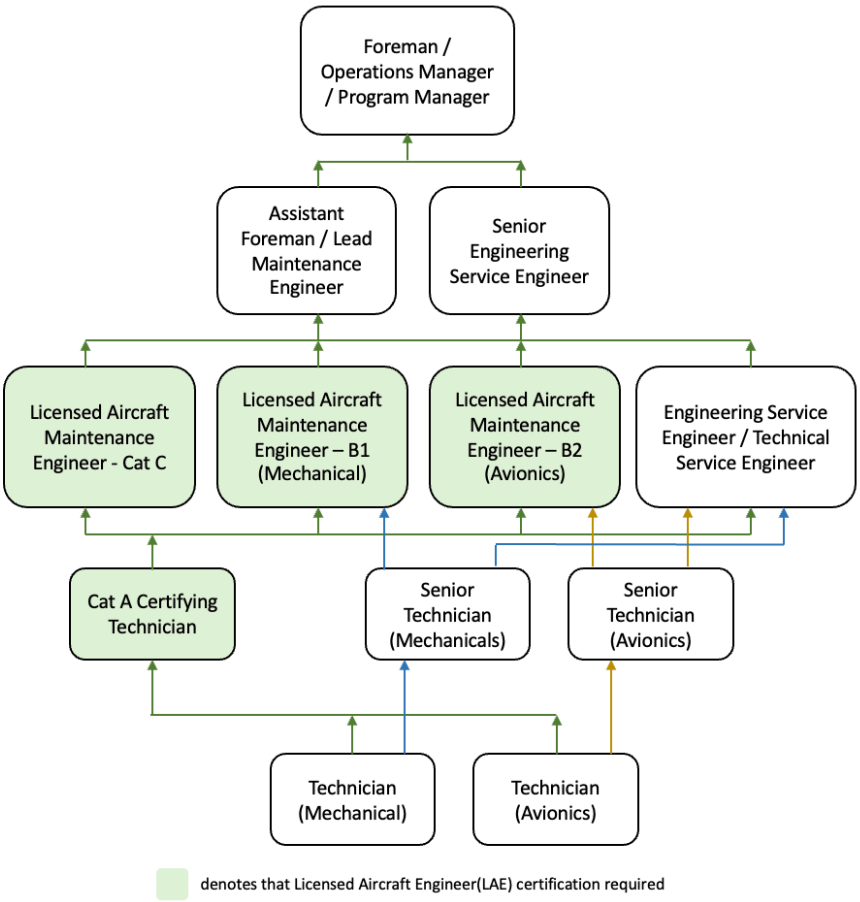


Figure 3. Simplified Career Progression Roadmap for Civilian Aircraft Maintenance Technician. Adapted from SkillsFuture.[4]

[4] See https://www.myskillsfuture.gov.sg/content/student/en/secondary/world-of-work/occupation/occupation-detail.Aircraft-Maintenance-Engineer-Apprentice-[Aircraft-Maintenance]-58028.html.

Table 8. Alignment of Skills between MT and CT

Rank	MT Role	CT Role	Skills
ME1-1	Apprentice	Technician	Work under supervision.
ME1-2	Mechanic	Category A certified Licensed Aircraft Engineer (LAE)	Work independently; sign off completed work for simple tasks.
ME2-1	Senior Mechanic	Category (B1/B2/C) certified LAE	Sign off completed work in certified areas. Lead a team to certify a platform's airworthiness.
ME2-2	Team Leader		
ME3	Supervisor	- Managerial Role: Assistant Foreman, Foreman, Operations Manager - Technical Role: Lead Technician or Service Engineer	Able to take on managerial or lead technical roles.
ME4 & above	Air Force Engineer	Aircraft Engineer	Able to demonstrate engineering skills.

Thus, Table 8 presents the skeletal version of the SBDAF for aircraft technician. For instance, it assumes that a CT with a Category A Licensed Aircraft Engineer (LAE) license possesses the skills needed to perform at the ME1-2 level since both are required to work independently and sign off on simple tasks. It is skeletal because the criteria to place them at the various sub-ranks have not been established. For example, a Category (B1) LAE can be directly accessed to either ME2-1 or ME2-2; an Assistant Foreman or Operations Manager can be directly accessed to either ME3-1, ME3-2, or ME3-3. Refer to Appendix A for the details concerning LAE categorization.

I sought the military's input to create a more refined and detailed SBDAF, given their better understanding of the aviation industry and can therefore better determine how these CT skillsets relate to the respective ranks. Table 9 shows the finalized SBDAF after incorporating the military's inputs.

Table 9. SBDAF for the Aircraft Maintenance Job

Rank	Military Role	Skills-Based Criteria for Direct Accession to the Stated Ranks	Remarks
ME1-1	Apprentice	Not Applicable	Military input: Insufficient skills to be considered for direct accession. CT is treated as a fresh recruit who needs to flow through ab initio training.
ME1-2	Mechanic	Category A LAE certification	Sign off completed work for simple tasks
ME2-1	Senior Mechanic	Possesses one LAE qualification (B1/B2/C)	Certify work completion for Mechanical/Avionics/Base tasks.
ME2-2	Team Leader	Possesses two or more LAE qualifications (B1/B2/C)	Well-versed in more systems. Can lead a team to achieve work outcomes.
ME3-1	Supervisor	- Assumes the role of Assistant Foreman with two or more LAE qualification - Assumes the role of Lead Technician or Service Engineer	Takes on managerial and leadership roles.
ME3-2		- Assumes the role of Foreman or Operations Manager	
ME3-3	Senior Supervisor	Not Applicable	Military's input: it is difficult to justify direct accession to higher ranks given their lack of knowledge on how the military functions, and no proven track record in the military.
ME4 & Above	Engineer		

Finally, Table 10 summarizes the direct accession criteria between FQDAF and SBDAF; the pros and cons of each DAF are the focus of the research.

Table 10. Summary of the Direct Accession Criteria under FQDAF and SBDAF

Rank	Role	FQDAF (Years of Experience)	SBDAF (Defined Skills Mapping)
ME1-1	Apprentice	N/A	Not Applicable
ME1-2	Mechanic	≤ 4	Category A certification
ME2-1	Senior Mechanic	> 4; ≤ 9	Possesses one LAE qualification (B1/B2/C)
ME2-2	Team Leader	> 9; ≤ 14	Possesses two or more LAE qualifications (B1/B2/C)
ME3-1	Supervisor	> 14; ≤ 19	- Assumes the role of Assistant Foreman with two or more LAE qualification or - Assumes the role of Lead Technician or Service Engineer
ME3-2		> 19; ≤ 24	- Assumes the role of Foreman or Operations Manager
ME3-3	Senior Supervisor	> 24; ≤30	Not Applicable
ME4 & Above	Engineer	Not Applicable	Not Applicable

C. STEP III: COMPARE AND CONTRAST SBDAF AND FQDAF USING MARKET DATA

1. Overview

The disparate direct accession criteria under each DAF changes the entry ranks accorded to each CT by their skills and years of work experience—some gain, some lose, while some may not experience a change. This difference allows me to use market data to analyze the merits of each framework through the perspective of the organization, MT, and CT. Figure 4 provides an overview of the methodology.

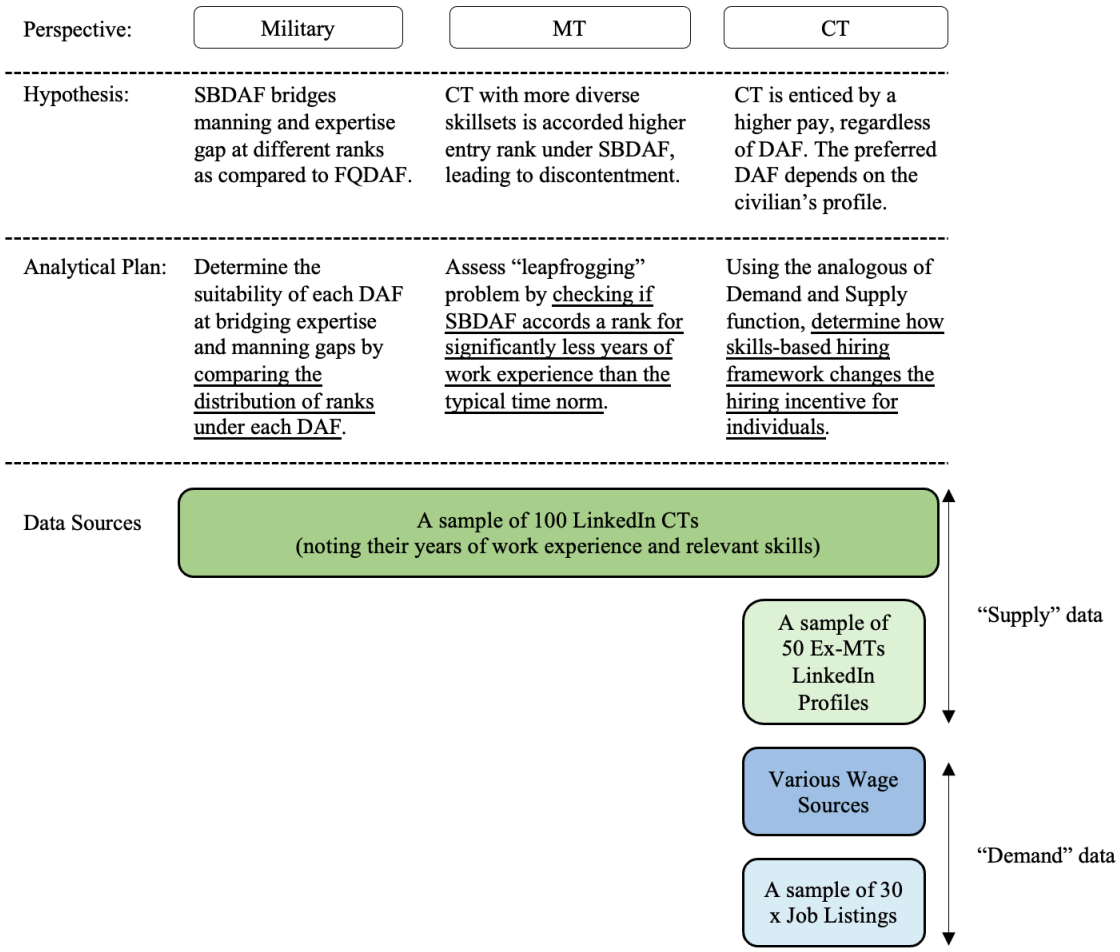


Figure 4. Overview of the Methodology for DAF Comparison

2. Constructing the Labor Supply Pool

The analysis is largely conducted by analyzing a sample of 100 CT LinkedIn profiles—noting their years of work experience and skills— that represent potential hires for the military.

I construct the supply pool by gathering a sample of relevant CT profiles from LinkedIn. The search term is defined to be "Aircraft Technician OR Engineer" with the geographical location set to "Singapore." I use the term "Engineer" because the nomenclature "Licensed Aircraft Engineer (LAE)" belongs to the CT and not the engineering job.

I compile 100 CT LinkedIn profiles and tabulate the variable of interest into a dataset. I exclude profiles that do not deal with maintenance work (i.e., Manufacturing, Fleet Management, and Component Maintenance) as they are not relevant for MT. Refer to Table 11 for the variables of interest and Table 12 for the summary statistics.

Table 11. Variables of Interest

Variable	Description	Remarks
Years of Experience (Continuous)	Years of work experience	Unit: Years (continuous variable)
Nationality (Categorical)	The geography of the school is used as a proxy. (e.g., a worker who attended Philippines Aeronautics School is likely a foreign national).	Nationality is compiled as the Singapore military can only recruit citizens.
Education Status (Categorical)	Bachelor, Diploma, Vocational Certs	-
Current Role (Categorical)	Current role as a CT: Foreman, Assistant Foreman, Assistant Manager, Operations Manager, Lead Technician, Service Engineer, LAE, Technician	-
Category A Technician (Binary)	A foundational license that allows workers to independently carry out maintenance and certify simple tasks.	The Singapore Airworthiness Requirements Part 66 categorizes LAE licensed by these listed categories. See Appendix A to learn about more LAE categorization. A CT can possess multiple licenses.
Category B1 LAE (Binary)	Specializes in mechanical systems.	
Category B2 LAE (Binary)	Specializes in avionics systems.	
Category C LAE (Binary)	Specializes in base maintenance.	
System Specialization (Binary)	A worker can specialize in more than one sub-system: - Turbine - Powerplant - Engine - Air Structure - Cabin - Fuel	-

Variable	Description	Remarks
	- Landing Gear	
Number of Certificates (Categorical)	A worker can possess 1, 2, or 3 LAE certificates(B1/B2/C). Having more licenses increases the worker's flexibility for work assignments.	Derived variable by summing up the number of certifications in B1/ B2/C.

Table 12. Summary Statistics for CT Supply Pool

	Citizenship Status		
	Foreigner	Local	Total
N	66 (66.0%)	34 (34.0%)	100 (100.0%)
Years of Working Experience	9.909 (4.220)	10.471 (4.627)	10.100 (4.347)
Education			
Bachelor	37 (59.7%)	8 (24.2%)	45 (47.4%)
Diploma	7 (11.3%)	23 (69.7%)	30 (31.6%)
Vocational or Technical Cert	18 (29.0%)	2 (6.1%)	20 (21.1%)
Current Role			
Assistant Foreman	0 (0.0%)	2 (5.9%)	2 (2.0%)
Assistant Manager	0 (0.0%)	1 (2.9%)	1 (1.0%)
Continuous Improvement Specialist	0 (0.0%)	1 (2.9%)	1 (1.0%)
Foreman	0 (0.0%)	1 (2.9%)	1 (1.0%)
LAE	47 (71.2%)	15 (44.1%)	62 (62.0%)
Lead Technician	1 (1.5%)	6 (17.6%)	7 (7.0%)
Operations Manager	0 (0.0%)	2 (5.9%)	2 (2.0%)
Production Planner	0 (0.0%)	1 (2.9%)	1 (1.0%)
Service Engineer	0 (0.0%)	2 (5.9%)	2 (2.0%)
Technician	18 (27.3%)	3 (8.8%)	21 (21.0%)
Qualification in the Number of Certificates			
No Cert	18 (27.3%)	4 (11.8%)	22 (22.0%)
1 Cert	33 (50.0%)	15 (44.1%)	48 (48.0%)
2 Certs	13 (19.7%)	13 (38.2%)	26 (26.0%)
3 Certs	2 (3.0%)	2 (5.9%)	4 (4.0%)

There are two characteristics of the sample that impact the analysis. First, nearly two-thirds of the CTs are foreign nationals, a trend that is similar across many labor-

intensive sectors in Singapore. The analysis will only focus on the local CT as the military is barred from recruiting foreign workers. Second, only citizen CTs take on higher-skilled roles while foreign CTs are concentrated in LAE and Technicians roles. I attribute this trend to the restrictions on foreign nationals' work permits, which generally only permit employment in roles with labor shortages (Ministry of Manpower Singapore, n.d.); this limits their upward mobility. Other interesting observations but of little relevance to the research question are contained in Appendix C.

3. Assessing the Implications for the Military.

I assume all 34 CTs are to join the military and analyze the distribution of entry ranks under each DAF to assess the propensity of each DAF to solve the military's manpower needs at the various ranks. I hypothesize that SBDAF enables the military to bridge the expertise and manning gaps more effectively at different ranks as compared to the FQDAF, although it is challenging to pinpoint the specific ranks at this juncture. In theory, the more useful DAF depends on the job's expertise and manning needs.

4. Assessing the Implications for MT

Unlike other organizations, the military largely develops and promotes from within due to the extensive training required, leading to high-performance standards. These standards meant that military personnel must compete within themselves and complete various appraisal milestones (e.g., boot camp, performance appraisal, and upskilling courses) to earn their promotion. Given the required effort, the military must consider the problem of leapfrogging on MT's morale.

Similarly, I assume all 34 CTs are to join the military and flag out the ranks where CTs take significantly less years of work experience under SBDAF as compared to FQDAF (since the accessed ranks under FQDAF corresponds to the progression of an average performer in the military).

5. Assessing the Implications for CT (Profile of Hires)

I hypothesize that younger CTs with more diverse skill sets are incentivized under SBDAF since their skills are now recognized, which results in a more favorable entry rank, whereas their skills are buried under their years of work experience under FQDAF.

Again, I assume all 34 CTs are to join the military and analyze the profiles of CTs who benefit from a higher entry rank under SBDAF—and these are likely the younger and more progressive CTs.

6. Implications for CT (Likelihood of Joining the Military)\

Nevertheless, CTs are inclined to consider the military only if it pays better than the market; they are indifferent to the employed DAF. Thus, I also look at market factors to assess the likelihood of CTs joining the military. If the military's remuneration is higher, CTs are likely to enlist regardless of the DAFs. If the financial incentives are lacking at a certain career stage, I assess how SBDAF might improve the odds for those who benefit under SBDAF.

I hypothesize that MTs are paid higher across all career stages, given the military's assertion of higher compensation compared to similar market positions to compensate for the military's onerous environment, a remuneration concept known as occupation wage premium. Under FQDAF, CT should be enticed to join if the military pays better for similar years of work experience. Under SBDAF, it depends on the CT's skillsets—some can be paid beyond their years of work experience.

I compare the wage function (monthly wage against years of work experience) between firms and the military. The lack of wage transparency in job listings and wage data sources led me to use aggregated wage data from online job portals such as Glassdoor. The details on constructing the wage function are found in Appendix B.

As the aggregate wage data obtained from online job portals is not sufficiently indicative of the demand picture, I plan to examine the seniority of job listings as well as MT's attrition pattern to form a more holistic picture of the hiring landscape. If the military's superior pay is depriving civilian firms of workers, it should be reflected in the

seniority that firms are hiring for (though firms can still hire foreign workers). Likewise, if the military pays better, few MTs should transition to CT jobs.

I compile 30 job listings from various online platforms (e.g., LinkedIn, Indeed.sg, Glassdoor), which represent all CT listings that I can find at the time of my research, as older listings become duplicates of newer ones. I also compiled 50 LinkedIn profiles of ex-MT to understand the frequency and timing of MT's attrition pattern, noting their years of service with the military, year of separation, and choice of career switch. I conduct the search on LinkedIn by specifying past occupation as "Republic of Singapore Air Force (RSAF)" or "Air Force Technicians." This yields results of ex-MT who transitioned to other occupations.

V. RESULTS

I begin by reporting the findings from the military and MT perspectives as they are more straightforward and involve only one data source—the LinkedIn supply pool. In contrast, evaluating CT's likelihood to join the military under SBDAF requires multiple sources and is presented last. I conclude the analysis by summarizing the similarities and differences between SBDAF and FQDAF.

A. IMPLICATIONS FOR THE MILITARY

Figure 5 shows the histogram of entry ranks under each DAF, assuming that all 34 citizen CTs are to join the military. The key difference is that a higher proportion will join the military as ME2-2 under FQDAF, and in contrast, ME3-1 and ME3-2 under SBDAF. Thus, the implication for the military is that adopting FQDAF translates into a higher likelihood of recruiting a CT at the ME2-1 level and likewise, ME3-1 and ME3-2 under SBDAF. Therefore, the choice of DAF is a useful manpower lever to bridge manning or expertise gaps; the SBDAF is more suitable if the gap exists at the more senior levels.

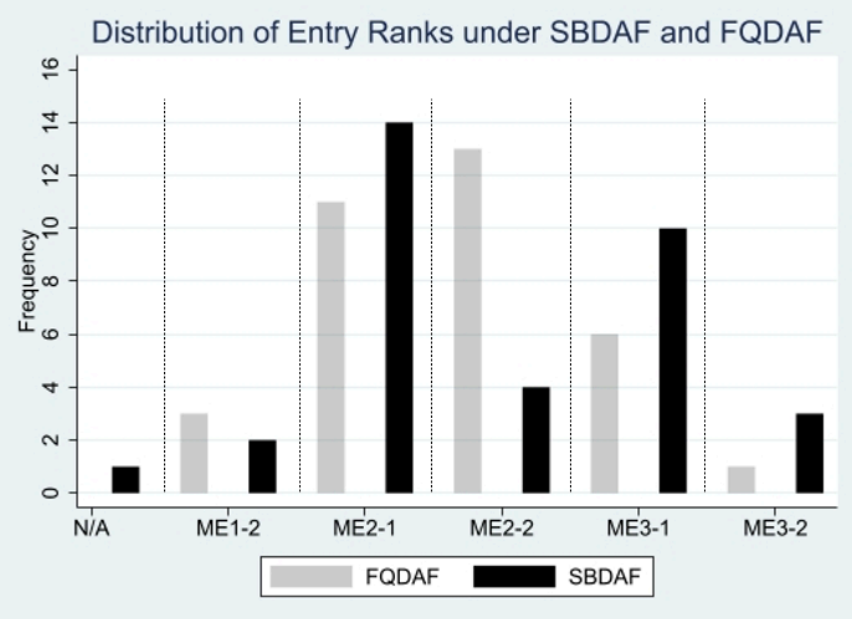


Figure 5. Histogram of Entry Ranks under Each DAF

Figure 6 shows the plot of entry rank against years of experience for each DAF. Under FQDAF, the spread of the CTs is dispersed over a narrower spectrum, as given by the years of experience. Conversely, SBDAF's emphasis on skills facilitates a more nuanced differentiation of the candidates' skills, as evident from the wider spread. Thus, the SBDAF provides a unique lens to benchmark candidates, which can inform the onboarding and training process. In addition, it supports the military's narrative to promote expertise development within the MDES corps.

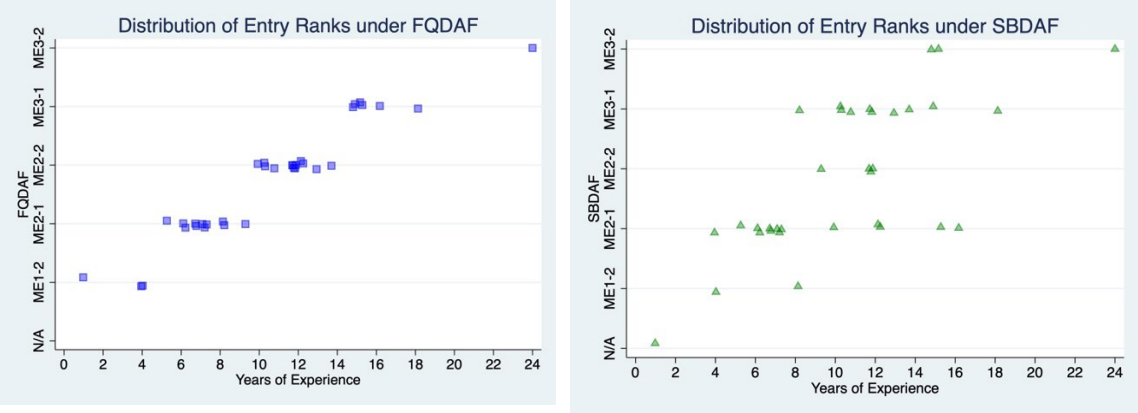


Figure 6. Distribution of Entry Ranks under FQDAF and SBDAF

B. IMPLICATIONS FOR MT

Figure 7 overlays the distribution of entry ranks under FQDAF and SBDAF. It shows that under SBDAF, CTs are starting at ME3-1 and ME3-2 for relatively fewer years of work experience as compared to FQDAF (recall that FQDAF reflects the progression of MTs with average performance), affirming the leapfrogging problem where the average performing MTs are likely to take issue at the prospect of CTs with less work experience—with no track record in the military—starting at a comparatively higher rank.

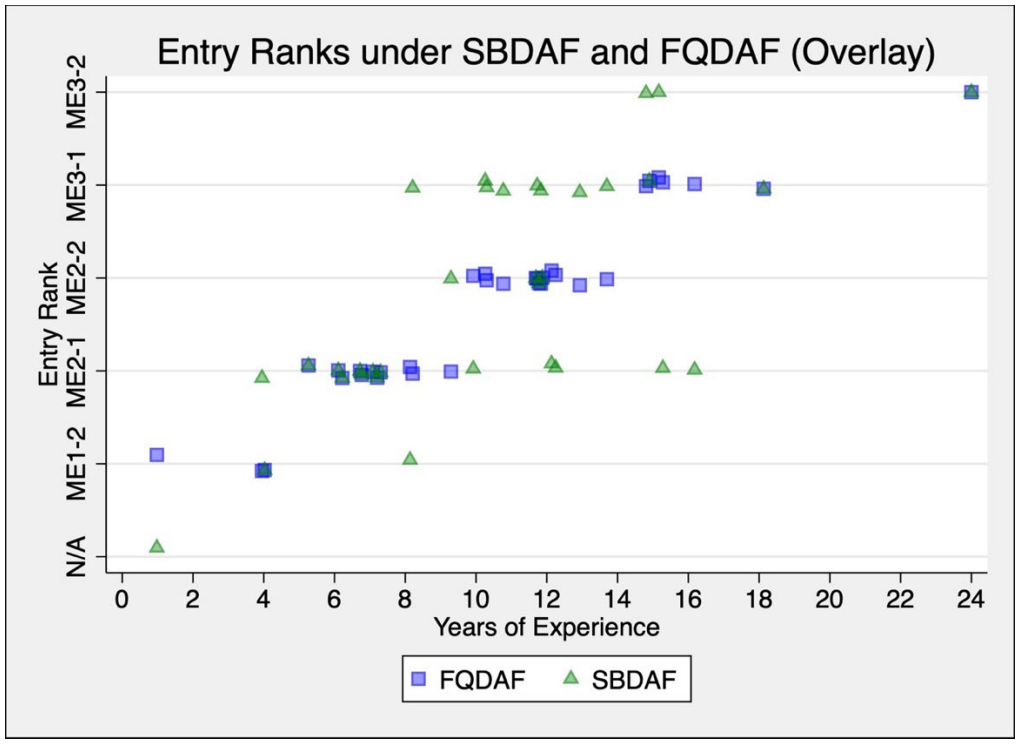


Figure 7. Overlaying the Distribution of Entry Ranks under SBDAF and FQDAF

C. IMPLICATIONS FOR CT (PROFILES OF HIRE)

Figure 8 shows the jitter plot of each CT's entry rank under SBDAF and FQDAF. Plots on the diagonal axis line show that the CT is accorded the same rank regardless of DAF. Those below the diagonal axis line get a higher rank under SBDAF as compared to FQDAF and likewise, those above the line get a higher rank under FQDAF. Table 13 lists the profiles of CTs who are affected by the change in DAF.

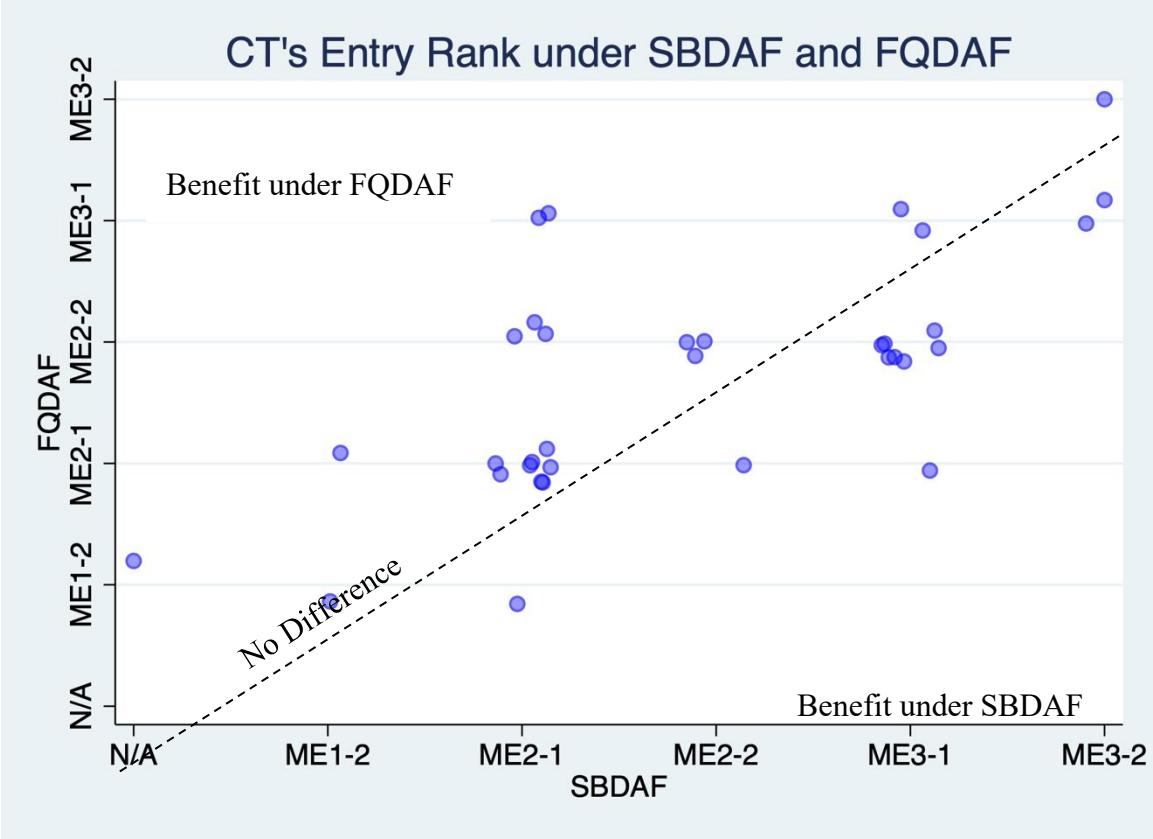


Figure 8. Plot of CT's Entry Rank under SBDAF and FQDAF

Table 13. Profiles of CTs Affected by the Change in DAF

Personnel ID	Experience	Current Role	No. of LAE Certificate
Benefit under FQDAF (above the diagonal line)			
F1	1	Technician	No Cert
F2	8	Technician	No Cert
F3	10	LAE	1 Cert
F4	12	LAE	1 Cert
F5	12	LAE	1 Cert
F6	15	LAE	1 Cert
F7	16	LAE	1 Cert
Mean: 10.6 Mean: 12.2 (without F1)			
Benefit under SBDAF (below the diagonal line)			
S1	8	Lead Technician	2
S2	4	LAE	1
S3	11	Lead Technician	2
S4	12	Lead Technician	3
S5	10	Assistant Foreman	2
S6	13	Service Engineer	2
S7	14	Lead Technician	2
S8	9	LAE	2
S9	10	Lead Technician	2
S10	12	Assistant Foreman	2
S11	15	Foreman	2
S12	15	Operations Manager	2
Mean of Experience: 11.1			

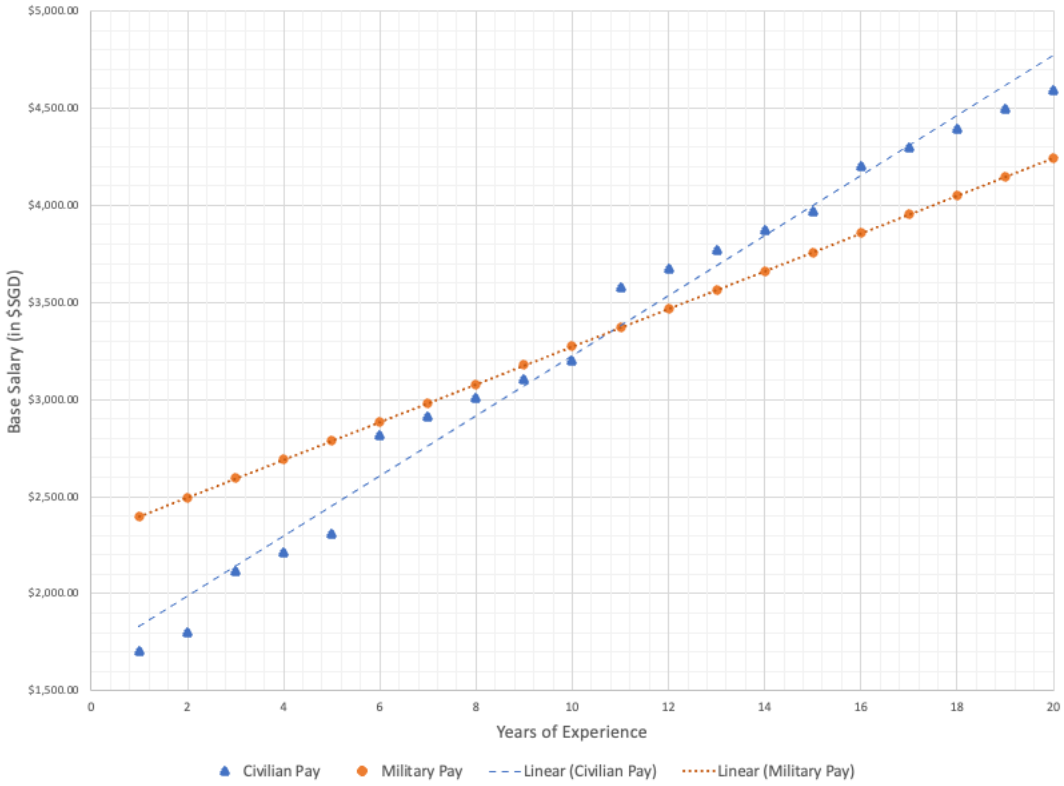
Table 13 shows 7 and 12 CTs who benefit under FQDAF and SBDAF respectively. It shows that FQDAF benefits those with more years of experience and narrower skill sets. This stands in contrast to SBDAF, which benefits CTs who have more skills despite having less work experience. Therefore, the SBDAF provides more incentives for younger CTs with broader skills to join.

One downside of SBDAF is that it does not consider depth of expertise. For instance, it assumes that the skills proficiency between personnel "S7" and "S9," both being Lead Technicians, are the same despite having different years of work experience. Therefore, the preferred DAF needs to take into consideration the nature of the job— by weighing the importance of depth of expertise vis-à-vis diversity of skillset.

D. IMPLICATIONS FOR CT (LIKELIHOOD OF JOINING THE MILITARY)

As articulated in the methodology section, the CTs are indifferent to the DAF employed by the military and are chiefly concerned about being paid higher than the market. Therefore, this study also examines other market factors to assess how SBDAF changes their likelihood of joining the military.

Figure 9 overlays the wage function for both CT and MT, the former is constructed from aggregated self-reported wages from various online portals such as Glassdoor while the latter is sourced from the RSAF career portal. Appendix B provides the detailed wage breakdown.



The wage function for CT and MT is constructed by consulting aggregate reported wages from online job portals such as Glassdoor. See Appendix B for details.

Figure 9. Constructed Pay Scale for CT and MT

Figure 10 compares the wages in terms of percentage difference relative to MT wage. It shows that the military pays approximately 29% more at the onset of the career, reaching parity before the 11th-year mark, before subsequently trailing the CT pay by approximately 9% during the late career stages. The pay data partially supports the hypothesis that the military subscribes to the occupational wage premium as the pay becomes less competitive during the later years. It is expected that the military pays substantially more during the initial years to bolster recruitment.

Figure 10. Percentage Difference in the Wage Functions Relative to MT's wage

As I lack a substantive source of wage data, I continue to explore other factors to validate that the wage shown in Figure 10 is reflective of the hiring landscape for CT.

Table 14 shows the mean and standard deviation (in parenthesis) of the required work experience in 30 advertised job listings, which represents all listings that can be obtained from leading online job listing sources (e.g., LinkedIn, Glassdoor, JobStreet) at the time of my research, as older listings are duplicates of newer ones. The requested

minimum years of work experience appear modest, including for the more senior roles such as LAE and Planner. The LAE role typically takes 5 or more years to achieve the necessary certification. Based on my experience analyzing LinkedIn listings, the Planner role is typically served by someone with prior experience as an LAE. In addition, two companies are willing to train workers with no experience. Thus, the findings suggest a manpower shortfall at the junior level. This supports the wage data that the military is the preferred employer in the early career stage, though firms can still firm to foreign workers.

Table 14. Minimum Work Experience in Advertised Job Listings

	Advertised Roles					
	Base Technician	LAE	Planner	Technician	Trainee	Total
N	1	16	1	10	2	30
Requested Years of Work Experience	3.000 (.)	5.667 (2.270)	8.000 (.)	1.600 (0.548)	. (.)	4.579 (2.694)

Next, I analyze MT's attrition patterns to assess the comparative appeal between MT and CT. Figure 11 shows the separation year of ex-MT, obtained from 50 LinkedIn profiles of former MT personnel. This is a self-selected sample that only includes ex-MTs—with updated employment records and credentials—who can be found on LinkedIn and is therefore not representative of all MTs who left the military. It is likely that the sample under-represents those who are not actively job hunting at the point of leaving the military, such as individuals who have already secured employment or are engaged in academic upskilling.

Their varied separation year across a span of 27 years underscores the limitations of evaluating attrition data from LinkedIn, especially considering the variances in factors influencing attrition rates. Despite this, their choices in career transition and the critical points of attrition can offer valuable insights for the job.

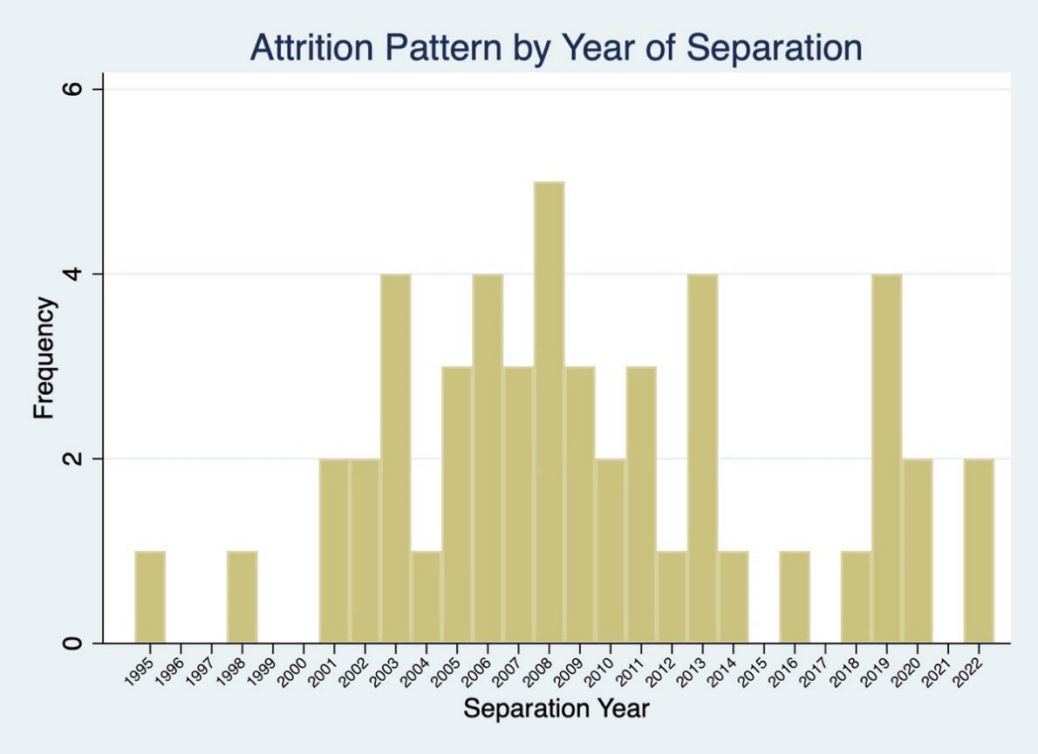


Figure 11. Separation Years of Ex-MT.

Figure 12 reflects the career transition choice of ex-MT—36% of ex-MT transit to CT while the rest ventures into other careers, which are concentrated in sales, product engineer, and environment health and safety roles. As sales roles are typically associated with a higher earning potential, it provides weak evidence that the military is not paying enough but this point cannot be generalized. On the other hand, it is concerning that many MTs are transitioning to CT jobs, which will be analyzed further.

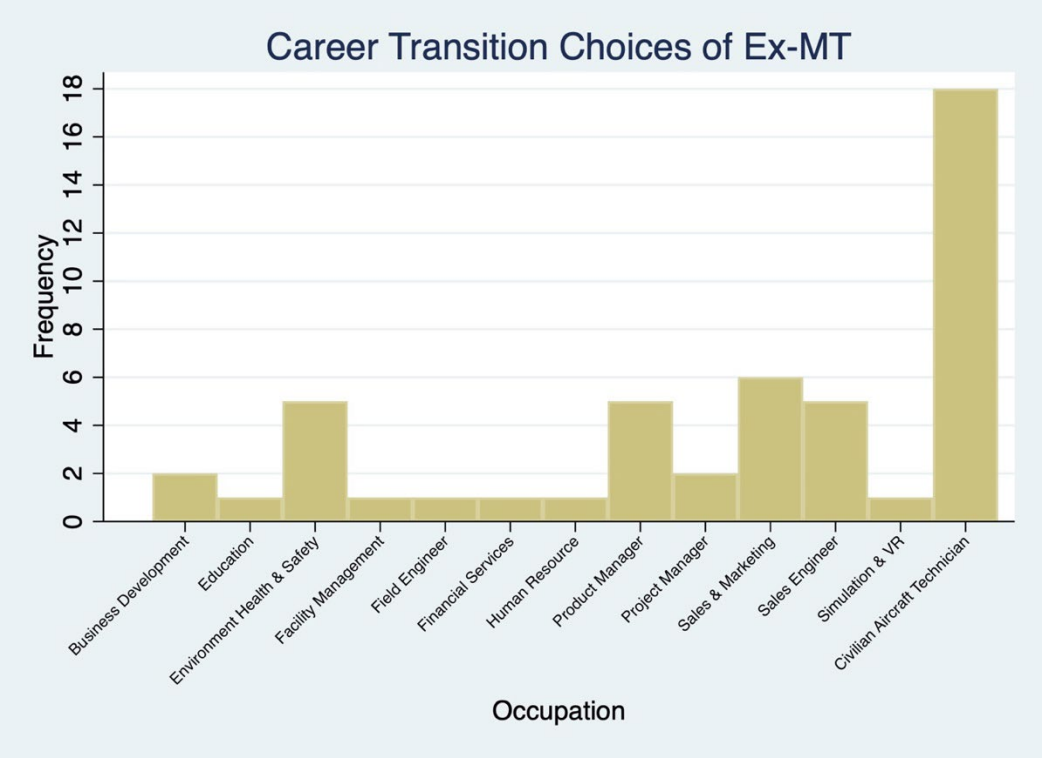


Figure 12. Career Transitions of Ex-MT.

Figure 13 presents the Kaplan-Meier (KM) survival analysis plot of MT's attrition pattern. The plot starts to decline from the 6th year onwards, reflecting the duration of the first-term contract (separating on the 5th year is an anomaly). Approximately 75% of the sample separates before 11 years of service; the key points of attrition are on the 6th, 7th, and 10th year; thereafter, the attrition rate is gradual.

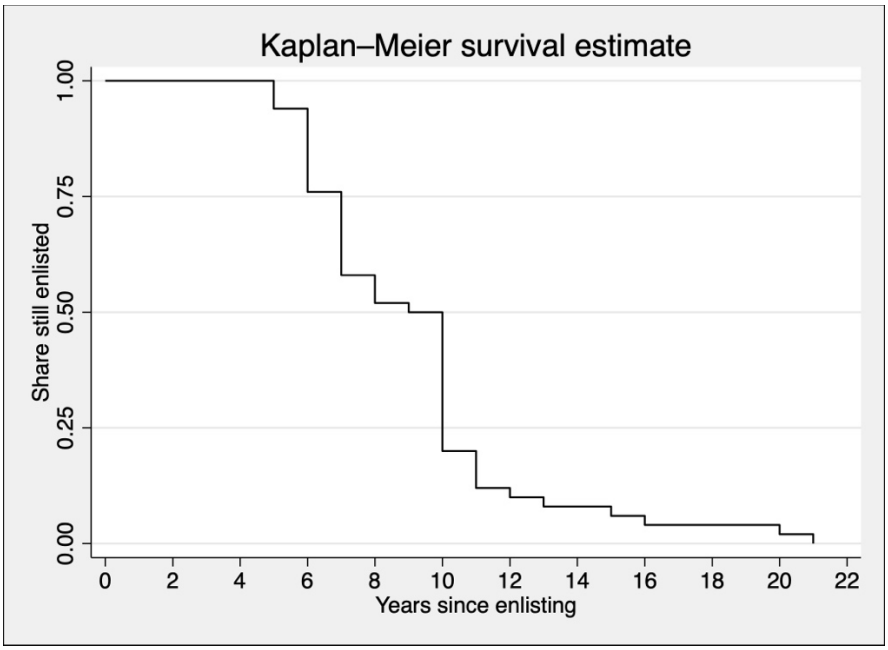


Figure 13. Kaplan-Meier Survival Analysis of MT's Attrition

Figure 14 shows the breakdown in terms of whether MT is transitioning to CT (same occupation) or exiting to pursue jobs not related to aviation maintenance. The plot shows that those exiting to pursue other career aspirations tend to leave earlier, as evidenced by the divergence of the KM plot. This is expected, as leaving the military younger offers more opportunities for career change.

The plot shows a sharp attrition of MT leaving to join CT at the 10th-year mark, indicating that CT becomes an increasingly viable career alternative. This supports the wage function that CT's pay becomes more competitive at the mid-career stage onwards.

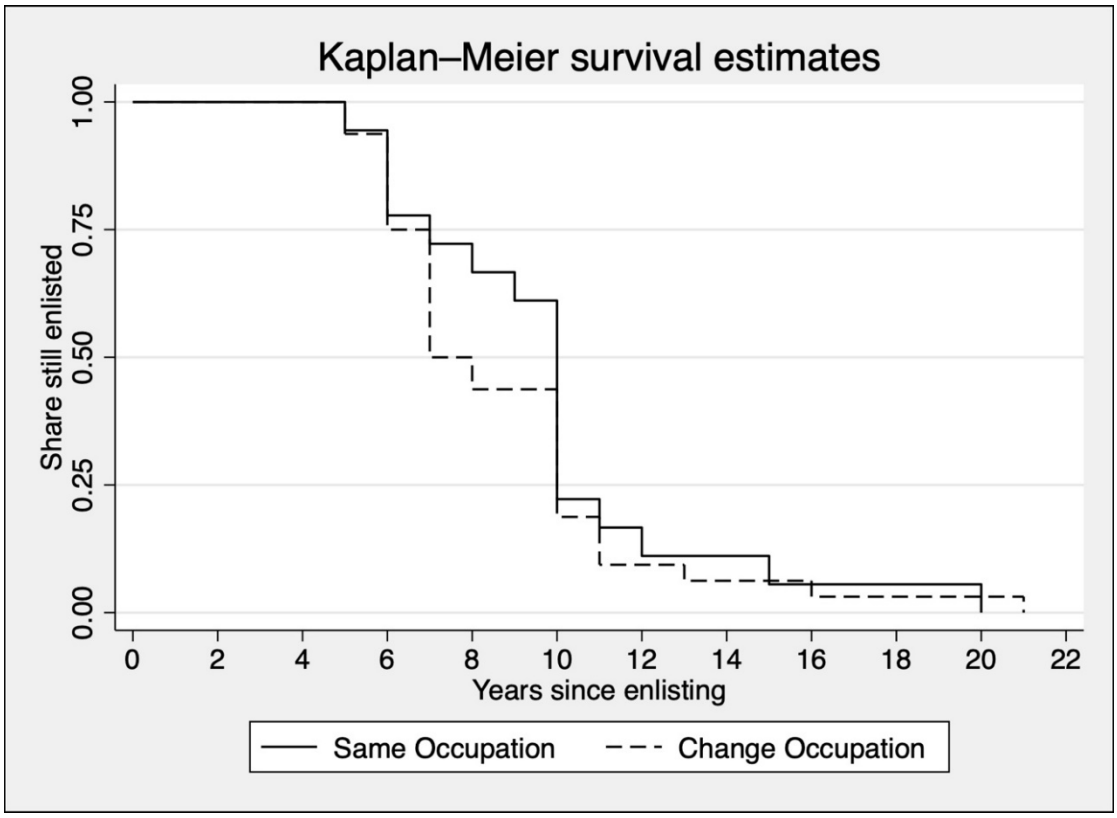


Figure 14. Attrition Pattern of MT Who Sought to Switch Occupation vis-à-vis Those Transitioning to CT Roles

The evidence so far supports the wage functions in Figure 9 that the military is attractive during the early career stages but less so from the mid-career stage onwards as the CT pay becomes more attractive. During the early career stage, the wage graph, the firms' shortage of workers at the junior level, and the modest attrition pattern at the end of the first contract affirm that the military is getting the pay benchmark right. In contrast, during the mid-career stage, the wage function, the lack of firms hiring at the more senior levels, and the strong trend of MT transitioning to join CT on the 10th year show that the civilian job is more attractive.

Having established the wage function, as shown in Figure 9, as reflective of the hiring landscape for CT, I proceed to analyze how SBDAF affects the likelihood of CT joining the military given its potential to pay CT beyond their years of experience.

Table 15 shows how SBDAF enhances CTs' pay and in turn, their likelihood of joining. The percentages are calculated with reference to civilian pay. For instance, personnel "S1" stands to be paid 2.4% and 24.9% higher under FQDAF and SBDAF respectively in relation to the market pay for his years of experience. Two notable observations arise from this analysis. Firstly, the greater the disparity between skillset and years of work experience, the more significant the benefits. Secondly, these CTs stand to be paid higher than the market rate for their years of experience under SBDAF. Consequentially, personnel "S3," "S4," "S10," "S11" and "S12" are more likely to consider the military under SBDAF than they would under FQDAF.

Table 15. Pay Increment for SBDAF Beneficiaries

Personnel ID	Years of Experience	Current Role	Rank under FQDAF	Pay under FQDAF	Rank under SBDAF	Years of Experience associated with Rank	Pay under SBDAF
S1	8	Lead Technician	ME2-1	2.4%	ME3-1	15	24.9%
S2	4	LAE	ME1-2	21.7%	ME2-1	5	26.1%
S3	11	Lead Technician	ME2-2	-5.8%	ME3-1	15	5.0%
S4	12	Lead Technician	ME2-2	-5.7%	ME3-1	15	2.3%
S5	10	Assistant Foreman	ME2-2	2.2%	ME3-1	15	17.4%
S6	13	Service Engineer	ME2-2	-5.5%	ME3-1	15	-0.4%
S7	14	Lead Technician	ME2-2	-5.4%	ME3-1	15	-2.9%
S8	9	LAE	ME2-1	2.3%	ME2-2	10	5.4%
S9	10	Lead Technician	ME2-2	2.2%	ME3-1	15	17.4%
S10	12	Assistant Foreman	ME2-2	-5.7%	ME3-1	15	2.3%
S11	15	Foreman	ME3-1	-5.2%	ME3-2	20	7.0%
S12	15	Operations Manager	ME3-1	-5.2%	ME3-2	20	7.0%

E. SUMMARY

Table 16 summarizes the similarities and differences between the DAF.

Table 16. Similarities and Differences between FQDAF and SBDAF

	FQDAF	SBDAF
Implication for the Military		
Augment Manpower and Expertise Gap	- Useful at the ME2-2 rank	- Useful at the ME3-1 and ME3-2 ranks.
Promote Expertise Narrative	No	Yes
Differentiate Quality of Hires	No	Yes
Differentiate Skills Proficiency	Debatable	No
Implication for MT		
Problem of Leapfrogging	- No leapfrogging issue as CTs are placed on the same scale as the average performer	- Leapfrogging exists at ME3-1 and ME3-2
Implication for CT		
Hiring Incentive	- Incentivizes CTs with many years of work experience with narrower skill sets.	- Incentivizes CTs with a more diverse range of skill sets.
Implication for CT (combined with Market Analysis)		
Hiring Incentive	- CTs with 10 or more years of work experience are unlikely to join the military due to lower pay.	- CTs benefitting from SBDAF are likely to join the military as they are paid beyond their years of work experience.

VI. RECOMMENDATIONS AND CONCLUSION

The findings are useful for the military to decide on the adoption of SBDAF and its supporting policies. I begin by discussing the considerations for adopting SBDAF. Thereafter, I cover the supporting policies that can promote the retention of MT and enhance the recruitment of CT. Finally, I conclude with the key takeaways from this study and my recommendations for future studies.

A. BUILDING THE CASE FOR SBDAF

With the findings, the military can decide on the more appropriate DAF that is better suited to the needs of the aircraft maintenance community. The choice is clear if SBDAF attracts the profiles that the military desires; they will likely assume managerial roles at the ME3-1 and ME3-2 ranks. But if the military is bleeding MTs at the ME2 level and is seeking more hands-on workers, then the FQDAF will bring in more of these workers. The military needs to examine its manning and attrition data to ascertain its needs.

Though the SBDAF does not differentiate skills proficiencies between workers for the same given skill set, I propose that the military can turn to other more effective means to do so—such as structured interviews and hands-on assessment. In all cases, it is likely that SBDAF will not be the standalone tool in assessing the suitability of hires as the current process requires candidates to go through multiple rounds of screening.

It is also possible that the military develop a hybrid DAF model that marries the strength of both SBDAF and FQDAF by considering both years of work experience and skills. The hybrid DAF may be a logical half-step to hedge against the downside of SBDAF, before deciding on its full implementation.

B. MANAGING MT'S MORALE

Should SBDAF be adopted, the military needs to think about how to manage the leapfrogging issue. There are three potential solutions aimed at ensuring that CTs are perceived to be worth their rank. First, CTs can be placed on probationary contracts to validate their competence in the military before accessing them to the designated rank.

Second, CTs can be enrolled in an elaborate onboarding program that gradually exposes them to the work undertaken by MTs, before immersing them in a MT-dominated environment. Third, freshly hired CTs can sit on bespoke CT-specific billets as their first assignment that deals with subjects that they are familiar with—such as in the area of audit or teaching best practices from civilian aviation. These billets are designed to channel their expertise from the civilian sector, ensuring that their knowledge and experience are used from the onset, while affording the space to adjust to the military. Underpinning these solutions is the need to gradually introduce these high-ranking CT hires into the military, by ensuring that the first few high-ranking CT hires pave the way by setting a positive precedence of commendable performance.

In addition, the military should think about how to stem the leakage of MTs transitioning to the CT job. The most obvious solution in the context of this study is to match the remuneration package with CT from the 10-year mark onwards. The other solution is to improve manning levels within the community to improve the pay-to-work ratio—by hiring more CTs to share the load. This leads nicely to the next section.

C. APPEALING TO CTS

Improving MT's remuneration from the 10-year mark onwards can not only better retain MTs but also attract CTs. In addition, the military needs to consider non-pay factors such as the need for a proper onboard and integration program—designed to set the CTs up for success. This is because these CTs are not new to the workforce and will likely pose many questions to the military recruiter concerning their ability to perform and adjust in the military.

D. EXTENDING SBDAF TO OTHER RELEVANT VOCATIONS

Although the aircraft maintenance job is chosen as the research subject, the value of the proposed methodology in quantifying the value of skills-based hiring can be expanded to other vocations, including jobs outside of the military. The process for quantifying the value of skills-based hiring for a particular job is largely similar, premised on the ability to construct a common framework to facilitate skills or credentials comparison.

Having gained experience in applying the methodology, I can say that the challenge in studying skills-based hiring in the context of the Cyber and Digital vocation lies in developing a skills framework that industry professionals adhere to. To ease the process, I recommended that the military collaborate with SkillsFuture to create the skills framework, which will simplify the process of constructing the SBDAF.

E. DATA LIMITATION

This research has also demonstrated LinkedIn data as a useful data source for evaluating the merits of skills-based hiring, albeit with non-trivial limitations. Drawing data from LinkedIn constitute a type of self-selection sample, which is neither random nor representative of the CT population. First, only workers with LinkedIn profiles are sampled, excluding those without a LinkedIn account, which leads to coverage error. The coverage depends on gaining access to an account that is sufficiently well-connected to the professional circle of the given job, due to the constraints imposed by LinkedIn on viewing profiles outside of one's connections. Second, the sample is neither random nor representative of the CT population's skills, as it over-represents those who are either actively job hunting or those with better credentials to boast. In addition, the accuracy of their digital resume is affected by the individual's diligence. The LinkedIn sample will not stand up to data science standards, but it is still useful to gain an appreciation of the quantitative benefits of skills-based hiring. Given these limitations, the military should supplement the findings using data from the relevant industry body such as the Association of Aerospace Industries (Singapore).

F. CONCLUSION AND RECOMMENDATIONS FOR FUTURE STUDIES

I have addressed the research question by demonstrating how the proposed proof-of-concept methodology can apply to the aircraft maintenance job and methodologically derived the pros and cons of skills-based hiring in the job's context. I have also proved that the benefits of SBDAF over FQDAF depend on the context of the job being studied. Therefore, the military needs to study the manning situation of the MT community in deciding whether to adopt SBDAF and deliberate if a hybrid DAF model—one that considers both years of work experience and skill sets—is more suitable. The value of the

methodology also applies to jobs outside of the military, premised on developing a common skills framework to facilitate the comparison of skills and credentials.

Future studies could explore supplementing this study with other data sources or applying this research's methodology to another job. Given the data limitations associated with using data from LinkedIn, repeating the study with a more representative sample would yield a more accurate set of results and would also serve to validate the use of LinkedIn samples. Additionally, applying the SBDAF to a different job could yield insights into the types of jobs that are best suited for this form of skills-based hiring practice.

APPENDIX A: UNDERSTANDING LAE CATEGORIZATION

This section provides the details to allow readers to appreciate the roles that are undertaken by CTs, which are closely tied to their skills, and outlines their progression pathway.

Figure 15 shows the four possible career pathways, published by SkillsFuture, for CT: aircraft maintenance, fleet maintenance, aircraft engine and component maintenance, and manufacturing. The study is concerned with the aircraft maintenance pathway, which parallels the MT's job scope (note that the aircraft maintenance pathway is reflected in Figure 3). Figure 15 aims to highlight other profiles of CT—with other skillsets—in the event that the military is keen to establish a SBDAF to recruit them.

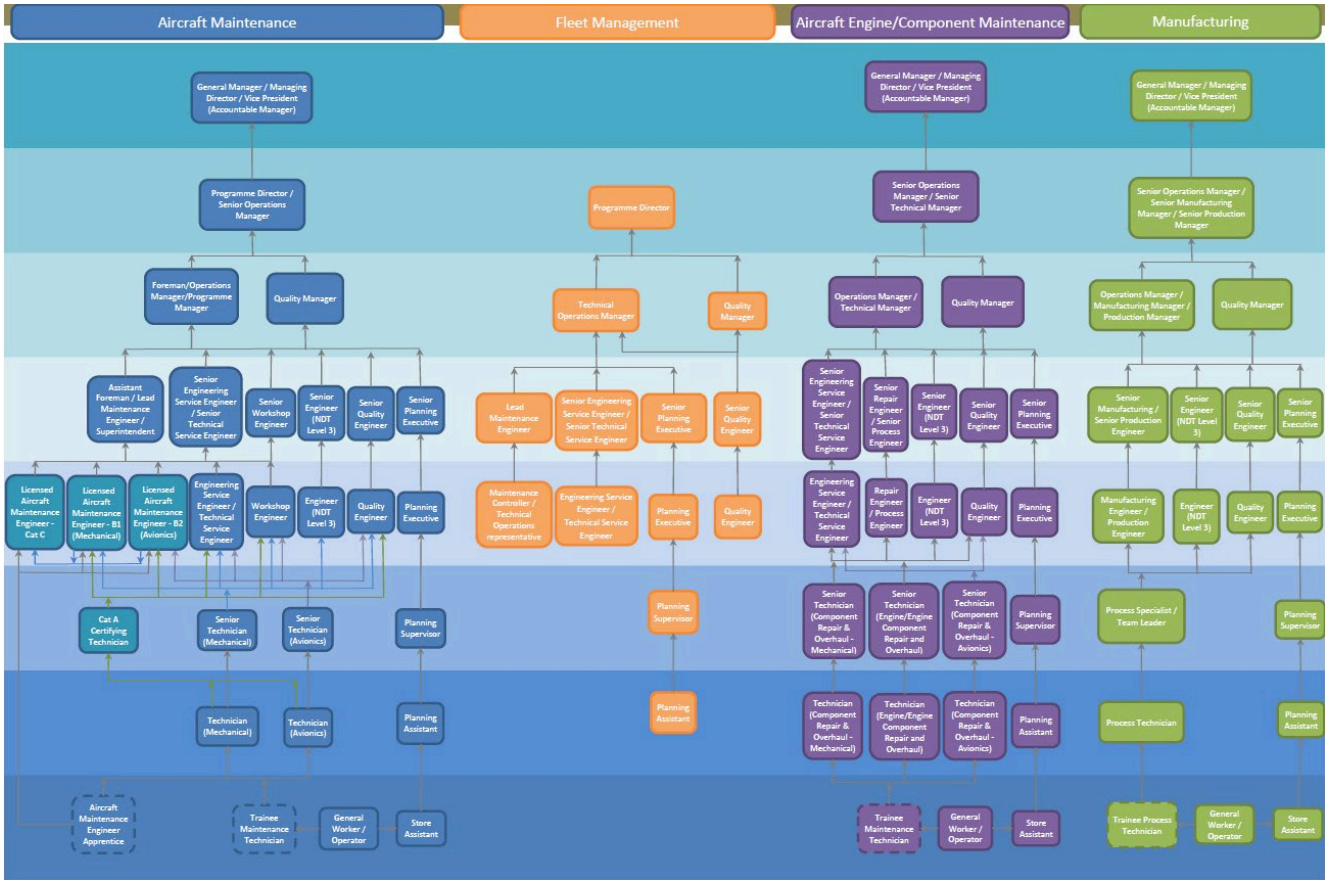


Figure 15. Career Pathways for Civilian Aviation Technicians. Source: SkillsFuture.[5]

[5] See https://www.myskillsfuture.gov.sg/content/student/en/secondary/world-of-work/occupation/occupation-detail.Aircraft-Maintenance-Engineer-Apprentice-[Aircraft-Maintenance]-58028.html.

The role that qualifies CT to conduct maintenance on aircraft is known as the Licensed Aircraft Engineer(LAE). The LAE—belonging to the CT career track—categorization in the Singapore aviation industry is spelt out under the Singapore Airworthiness Requirements(SAR), Part 66 standards, which comes in 4 categories: A, B1, B2 and C (Civil Aviation Authority of Singapore, 2013). Table 17 extracts the definition of the LAE categories from the aforementioned document.

Table 17. Definitions of CT License under SAR Part 66. Source: CAAS

License Category	Definition
A	An aircraft maintenance licence which permits the holder to issue certificates of release to service following minor scheduled line maintenance and completion of simple tasks in line and base maintenance, as specified in SAR- 145, within the limits of tasks specifically endorsed on the certification authorization. The certification privileges are restricted to work that the authorization holder has personally performed.
B1	An aircraft maintenance licence which permits the holder to issue certificates of release to service and to act as B1 support staff following maintenance of the aircraft structure, powerplant, mechanical and electrical systems. Certification of work on avionics systems requiring only simple tests to prove their serviceability are also included in the privileges. Troubleshooting on avionics systems is not allowed. Category B1 shall automatically include the appropriate A subcategory.
B2	An aircraft maintenance licence which permits the holder to issue certificates of release to service and to act as B2 support staff following: — maintenance of avionics and electrical systems; and — performance of electrical and avionics tasks within powerplant and mechanical systems, requiring only simple tests to prove their serviceability.
C	An aircraft maintenance licence which permits the holder to issue certificates of release to service following base maintenance on aircraft. The privileges apply to the aircraft in its entirety in a SAR-145 organization.

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APPENDIX B: WAGE DATA

Given that the military and commercial wage data are difficult to obtain in the Singapore's context, the wage function is constructed by consulting different online sources. For CT, it is obtained by averaging aggregate wage data obtained from three different online portals: Salary Explorer, Payscale and MyCareerSG. For MTs, the pay formulation assumes a linear increment, starting from a salary of $2,400 and progressing to the upper pay bracket of $5,700 for ME4, which I assume to be reached on the 35th years of military service prior to ME5 promotion (See Figure 2). The pay data can be obtained on the RSAF career portal. Refer to Table 18.

Table 18. Constructed Pay Scale for MT and CT

Years of Work Experience	Civilian Technician				Military Technician
	Average	Source: Salary Explorer	Source: Payscale	Source: MyCareerSG	Source: RSAF Career Portal
1	$1,704.33	$1,930.00	$1,083.00	$2,100.00	$2,400.00
2	$1,801.12	$1,930.00	$1,236.53	$2,236.84	$2,497.06
3	$2,114.58	$2,580.00	$1,390.06	$2,373.68	$2,594.12
4	$2,211.37	$2,580.00	$1,543.59	$2,510.53	$2,691.18
5	$2,308.16	$2,580.00	$1,697.12	$2,647.37	$2,788.24
6	$2,814.95	$3,810.00	$1,850.65	$2,784.21	$2,885.29
7	$2,911.74	$3,810.00	$2,004.18	$2,921.05	$2,982.35
8	$3,008.53	$3,810.00	$2,157.71	$3,057.89	$3,079.41
9	$3,105.33	$3,810.00	$2,311.24	$3,194.74	$3,176.47
10	$3,202.12	$3,810.00	$2,464.77	$3,331.58	$3,273.53
11	$3,578.91	$4,650.00	$2,618.30	$3,468.42	$3,370.59
12	$3,675.70	$4,650.00	$2,771.83	$3,605.26	$3,467.65
13	$3,772.49	$4,650.00	$2,925.36	$3,742.11	$3,564.71
14	$3,869.28	$4,650.00	$3,078.89	$3,878.95	$3,661.76
15	$3,966.07	$4,650.00	$3,232.42	$4,015.79	$3,758.82
16	$4,202.86	$5,070.00	$3,385.95	$4,152.63	$3,855.88
17	$4,299.65	$5,070.00	$3,539.48	$4,289.47	$3,952.94
18	$4,396.44	$5,070.00	$3,693.01	$4,426.32	$4,050.00
19	$4,493.23	$5,070.00	$3,846.54	$4,563.16	$4,147.06
20	$4,590.00	$5,070.00	$4,000.00	$4,700.00	$4,244.12

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APPENDIX C: CHARACTERISTICS OF THE CT SUPPLY POOL

This appendix presents interesting observations about the sample of 100 Civil Technicians (CTs). While these observations are not directly relevant to the research question, they could still be useful for policymakers in addressing other issues.

a. Foreign workers comprise two-third of CTs in the labor supply pool.

Approximately 2 in 3 CTs in the sample is a foreign worker, which suggests that this occupation is reliant on foreign workers. This observation is consistent with other labor-intensive occupations (e.g., construction, cleaning) in Singapore.

Figure 16 shows the skills distribution between local and foreign workers. Air Structure, Avionics and Engine are the most common specialization. Notably, no citizen CT specializing in cabin maintenance, which is expected as cabin maintenance is a low skills domain that is typically undertaken by foreign workers. The relatively lower specialization in fuel, turbine, and landing systems does not imply that these are rare skillsets. Instead, they may be included within other specializations.

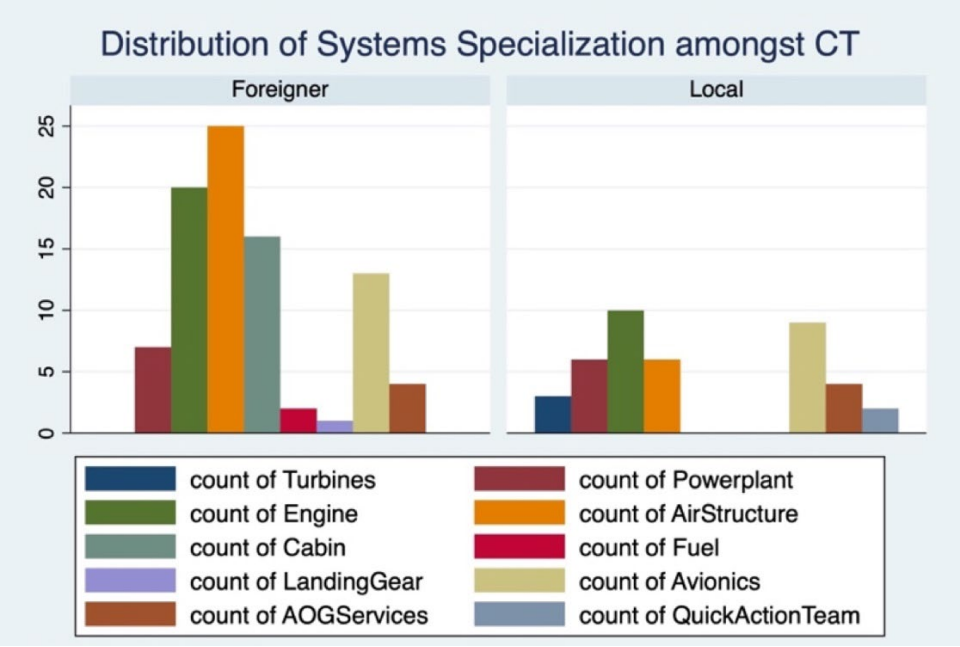

Figure 16. Distribution of Skillsets amongst CT.

The distribution of skills invites the military to tap on these foreign CTs as their services can still be contracted through local firms. For example, foreign CTs can be contracted to conduct cabin maintenance, freeing MTs to perform higher value maintenance work such as maintaining combat equipment.

b. Higher skilled jobs are taken up by local CTs.

Figure 17 shows the distribution of job between local and foreign CT, reflecting that most higher skilled jobs are taken up by locals. This might be attributed to the restrictions placed on foreign workers' work permit, which prevent them from assuming other roles that are not specified on their work permit. This is plausible because these foreign workers are typically brought in to fill labor intensive roles, which typically faces a shortage of workers.

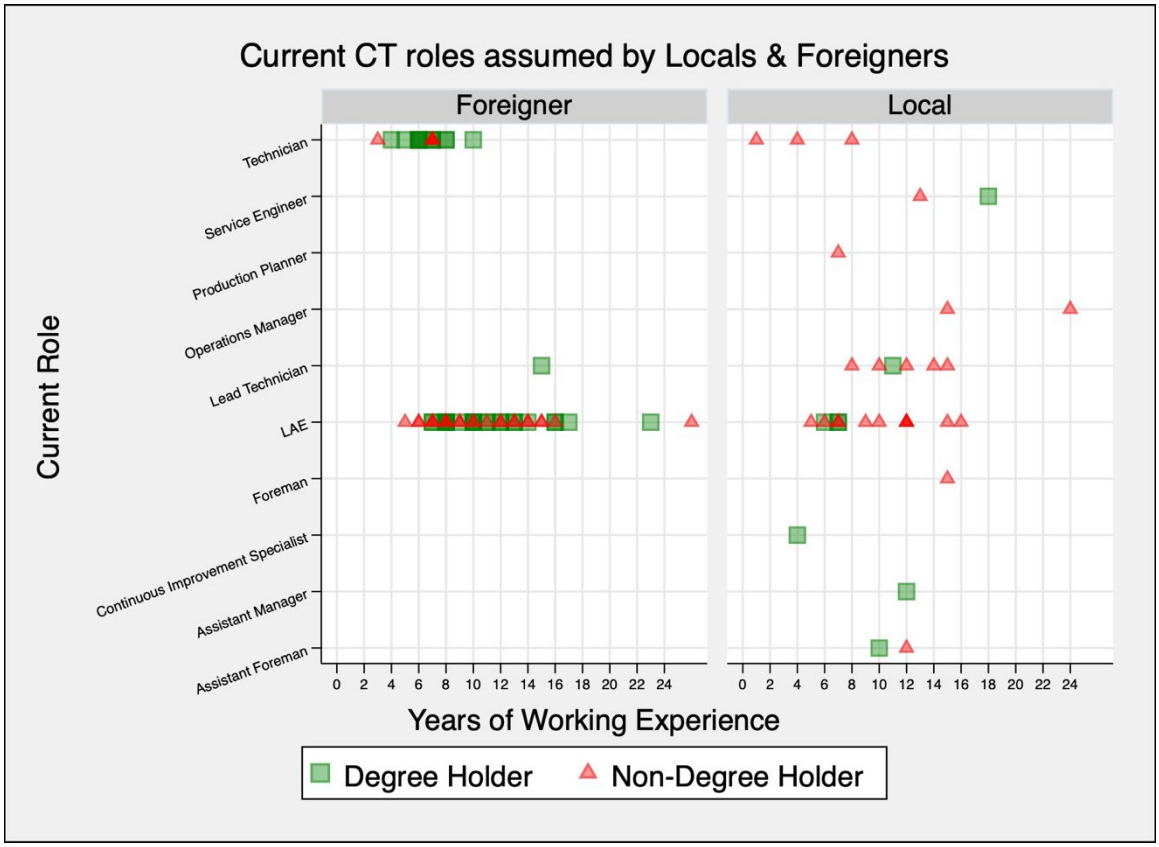

Figure 17. Distribution of Roles between Local and Foreign Workers.

The prospect of these jobs being mainly taken up by locals may entice MT to transition to these roles. Therefore, it is imperative that the military continues to pay a competitive wage to stem attrition, noting the trend of MT transitioning out at the mid-career stages.

c. Most local CTs do not possess a degree.

Figure 17 also shows that most local CTs do not have a degree. From my experience tabulating LinkedIn data, those who obtained their degrees frequently transition from technician roles to engineering-related positions, which represents a natural career progression. In addition, these local LAEs with degrees are likely required to gain experience as a LAE prior to taking on engineering roles.

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