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Evaluation of The Program Facilitating Productio Facilities/Infrastructure for Industrial Entrepreneurs in DKI Jakarta Using The Propensity Score Matching Method

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Abstract
Micro, small, and medium enterprises (MSMEs) play a central role in boosting Jakarta's economy; policies that support competitiveness and productivity therefore need to be prioritised. This study assesses the effectiveness of the New Industrial Entrepreneurship Program (WUIB), which is part of the Integrated Entrepreneurship Development (PKT) initiative. Drawing on production function theory, this study employs a quasi-experimental approach using Propensity Score Matching (PSM) on thousands of business actors in the culinary and craft/fashion sectors, comparing WUIB recipients — who received production facilities accompanied by technical training — with non-recipient business actors. The results of the empirical analysis show that facility recipients experience a significant increase in turnover of Rp 10–16 million per year. This effect is consistent across model specifications and passes validity and robustness tests across various matching algorithms, indicating that the policy intervention is effective. The impact is short-term but demonstrates a multiplier effect that strengthens regional economic activity. The study also addresses potential limitations, including the identification of spillover effects to business actors outside the target group, the constraints of a cross-sectional design that limit long-term inference, and the potential confounding influence of complementary programs — namely marketing assistance, mentoring, financial reporting facilitation, and capital facilitation — delivered as part of the broader CCP program suite. The socio-economic analysis further highlights broad benefits for women-led MSMEs, for businesses expanding their workforce capacity, and for actors with a primary or secondary education background. These findings encourage policymakers to expand and continue the program as part of a CCP strengthening strategy grounded in data-based targeting, and to improve turnover-based performance monitoring through an integrated information system.

INTRODUCTION

Strengthening the micro, small, and medium enterprises (MSMEs) sector is the principal strategy for realising an inclusive and sustainable urban economy in DKI Jakarta (Provincial Government of the Special Capital Region of Jakarta, 2022), particularly in the context of expanding employment opportunities, reducing inequality, and recovering from the pandemic, which continues to affect the region's persistently high open unemployment rate (Novitasari & Kurniawan, 2023; Alex et al., 2022). Strong MSME performance is widely regarded as a foundational driver of economic growth, both nationally and regionally, as well as of job creation (Surya et al., 2021; Obi et al., 2018; Wulansari & Kurniawan, 2018; Wong,

Ho, & Otio, 2005; Van Praag & Versloot, 2007; Tahir & Burki, 2023). This is reflected in the contribution of MSME performance to Indonesia's national GDP at 60.5% and labour absorption of up to 96.9% of the total national workforce (Directorate General of Treasury of the Ministry of Finance of the Republic of Indonesia, 2024). Moreover, DKI Jakarta Province, which contributes the largest share of the national economy at 16.64% (Central Statistics Agency, 2023), is dominated by the role of MSMEs at 55% (Rafiqah, Susilastuti, & Bernanthos, 2021) and absorbs 2.5 million workers (Sunaryo, Gantino, Rova, & Prayoga, 2019).

As a foundational sector of the national economy, MSMEs in Indonesia continue to face a number of challenges, including limited managerial skills and product innovation, restricted access to financing, and uneven government policies (Cahya et al., 2025; Mutalib, 2025). Digitalisation opportunities are increasingly wide-ranging, yet obstacles to mastering technology continue to constrain MSME competitiveness (Satpathy et al., 2025; Ratnaningtyas et al., 2025). In addition, various studies and reports indicate that MSMEs also face endogenous and exogenous constraints — including problems with raw material supply, finance, human resources, technology and infrastructure inefficiencies, poor marketing, intense competition, and administrative, bureaucratic, and governance challenges — that affect MSME growth in developing countries (Sobir, 2020).

One of the strategic initiatives of the DKI Jakarta Provincial Government is the New Industrial Entrepreneurship Program (WUIB), which takes the form of training facilitation and the provision of production facilities and infrastructure as part of the Integrated Entrepreneurship Development (PKT) policy, in accordance with DKI Jakarta Governor's Regulation Number 2 of 2020 concerning Integrated Entrepreneurship Development. The WUIB program targets high-potential sectors — namely culinary and craft/fashion — with the aim of spurring productivity growth and generating multiplier effects at both the micro and macro levels. From 2022 to 2024, the WUIB program facilitated 28,499 business actors with funding of more than Rp 132 billion.

A review of the international literature and practice reveals that a number of studies in Indonesia and other countries demonstrate that production equipment assistance has a positive impact on increasing the capacity and business turnover of MSME actors, as found by Prasetyo (2022) in Palembang, Hasmirah (2017) in Palopo, and Syaputra and Mardianis (2024) in Jambi. Comparable policies in Japan (Shapira, 1992), South Korea (Doh & Kim, 2014), Malaysia (World Bank, 2022), Bulgaria (Nigohosyan, Vassileva, & Vutsova, 2025), and Ethiopia (Sisay, Molla, Mekonnen, & Gadisa, 2025) similarly support MSME innovation and productivity through productive means interventions, though the sustainability and relevance of such programs often remain challenges. The national literature, moreover, is largely limited to small populations or qualitative approaches, meaning that results do not reflect real effectiveness at the metropolitan scale.

The novelty of this research lies in four key aspects. First, this study represents an advance in the evaluation of local entrepreneurship programs in Indonesia, which have been predominantly limited to qualitative approaches or small-scale studies. Second, by applying Propensity Score Matching (PSM) to microdata drawn from a large population in DKI Jakarta, this research provides a robust quasi-experimental framework for causal impact estimation. Third, this study compares multiple matching algorithms — nearest neighbour, kernel, and

radius caliper — to ensure result robustness, a level of methodological rigour rarely applied in Indonesian MSME policy evaluation. Fourth, this research separately analyses two distinct sectors — craft/fashion and culinary — to identify sector-specific program effects.

Although the WUIB program has been implemented at scale since 2022, robust academic evidence assessing the effectiveness of providing production facilities and infrastructure for industrial business actors in Jakarta remains limited. Existing program evaluations have not employed quantitative analysis that compares the performance of recipient and non-recipient groups in a balanced manner, and the program's impact on strengthening the productivity and competitiveness of urban MSMEs has therefore not been rigorously measured empirically. To address this gap, the present study tests the impact of MSME production facilitation policies through a cross-sectoral quantitative approach that ensures the validity and balance of business actor characteristics. By applying the PSM technique to large-population microdata from DKI Jakarta, this study advances the evaluation of local entrepreneurship programs that have hitherto been limited to qualitative or small-scale approaches. Establishing the effectiveness of government intervention on the basis of robust empirical evidence not only strengthens the decision-making process, but also opens methodological space for the development of non-experimental policy evaluation in the domain of urban MSMEs.

The objectives and benefits of this research are aligned with evidence-based policy development. By demonstrating the effectiveness of government intervention through robust empirical evidence, this study strengthens decision-making processes and provides a replicable methodology for evaluating similar programs across different regions and sectors. The research benefits include: (1) providing policymakers with rigorous impact estimates to guide resource allocation; (2) offering a validated methodological framework for future program evaluations; (3) identifying beneficiary characteristics associated with greater program responsiveness; and (4) contributing to the academic literature on MSME policy evaluation in developing country contexts.

RESEARCH METHODS

The conceptual foundation of this research is rooted in production function theory, which describes the relationship between inputs — such as capital, labour, and technology — and business output (Pindyck & Rubinfeld, 2017; Moss, 2016). In this study, government facilitation in the form of production tools is represented as additional capital that can theoretically and empirically increase the output and Total Factor Productivity (TFP) of MSME actors in DKI Jakarta. The conceptual framework maps production means interventions as a mechanism for increasing turnover in the short term, and theoretically posits that such interventions may generate spillover effects on business actors outside the target group through economic and social interactions (Angelucci & Di Maro, 2015; Srhoj et al., 2021). However, in the empirical model of this study, it is assumed that no significant spillover effect occurred during the observation period — meaning that changes in output in the control group are attributed entirely to factors other than the program applied to the treatment group — so that a pure impact estimate can be attributed to the treatment, whether through business networks or other entrepreneurial capacity-building interventions.

The year 2023 is used as the reference year for policy intervention, corresponding to the early years of digitalisation of the PKT Program in the implementation of the WUIB

Program. On the short-run measurement horizon of 2024, business output is measured by current-year turnover, while the principal equipment facilitation received in 2023 is treated as a fixed initial asset during the observation period. In the absence of additional equipment investment throughout 2024, the principal source of output change in the short term is variation in variable factors such as labour or working hours, supported by the adoption of innovations and training provided in the preceding year. The empirical model is further strengthened by the use of 2023 asset values as a treatment selection variable, while the labour factor serves as the principal determinant of production dynamics in 2024. This approach is consistent with MSME production research practices, which generally measure work inputs in total working hours rather than simply the number of workers, thereby producing a more accurate representation (Pencavel, 2014). Thus, the change in turnover in 2024 in the short run reflects the combined effect of fixed capital program assistance, increases in variable factors (working hours and productivity), and improvements in managerial efficiency through training.

Based on the existing literature, policy interventions targeting MSMEs have proven effective in encouraging growth and improving economic performance — whether through facility assistance, capital support, or subsidies — with demonstrated impacts on business growth, productivity, innovation, and poverty reduction (Audretsch, 2003; Tahir & Burki, 2023; Dasaraju et al., 2020; Bronzini & Piselli, 2016; Acevedo & Tan, 2010). Empirical evaluations across various countries and sectors show that assistance with production facilities, capital, and business development services can significantly increase output, capacity, business efficiency, and competitiveness among MSME actors, as reported by Prasetyo (2022), Syaputra and Mardianis (2024), Hasmirah (2017), Maliek et al. (2024), Srhoj et al. (2019, 2021), and other studies employing matching, panel, and mixed-method approaches. The outcome variables commonly used in these studies include operating income (turnover), capital, labour, and profit, as these are regarded as the principal indicators of MSME performance under government intervention. Longitudinal and panel studies provide stronger estimates of the persistence and dynamics of policy impacts; however, in the context of the present study, annual business turnover is used as the primary proxy for outcomes, as it is both relevant and objectively measurable, consistent with cross-sectoral MSME policy research practices (Baltagi, 2005; Khandker et al., 2010; Prasetyo, 2022; Syaputra & Mardianis, 2024; Maliek et al., 2024; Srhoj et al., 2021; McKenzie, 2017).

Various studies confirm that independent variables relevant to assessing the impact of policies on MSME performance include business-level factors such as the number of workers, capital/assets, business age, and business type according to the KBLI classification, as these variables have been shown to substantially affect the production process and output within the Cobb–Douglas production function framework (Moss, 2016; Syaputra & Mardianis, 2024; Hasmirah, 2017; Srhoj, Škrinjarić, & Radas, 2019; Bronzini & Piselli, 2016; Zhang & Zhou, 2025; Surya et al., 2021). In addition, research on the effectiveness of MSME programs consistently shows that business owner profiles — including education level, age, gender, marital status, and family ownership status — also significantly affect business performance, with higher education, experience, and gender diversity associated with better output and greater business resilience in the long term (Corvello et al., 2023; Scott, 2022; Sajuyigbe et al., 2021; Maravilla & Flores, 2025; Ikyanyon & Jato, 2022; Aldamiz-Echevarría et al., 2017; Naciti, Rupo, & Pulejo, 2022). These findings support the inclusion of business and owner

profile variables as an integral part of the empirical model in MSME policy impact evaluation, ensuring that intervention effect estimates are validly controlled and interpretable, and that they reflect the diversity of MSME characteristics in urban and developing contexts (Syaputra & Mardianis, 2024; Corvello et al., 2023; Nuong, 2022).

To measure the impact of program interventions on MSMEs, several evaluation methods have been employed across the literature, including Mahalanobis distance and propensity score matching, two-way fixed-effects regression, dose-response function analysis, placebo tests, and robustness checks (Srhoj, Lapinski, & Walde, 2021; McKenzie, 2017; Srhoj, Škrinjarić, & Radas, 2019; Bronzini & Piselli, 2016; Criscuolo, Martin, Overman, & Van Reenen, 2019). Given the characteristics of the WUIB program — which provides production facilities and infrastructure as part of the PKT program in DKI Jakarta Province, has only been implemented over the 2022–2024 period, and has not yet demonstrated long-term impacts — a cross-sectional comparison with robust standard errors between business actors receiving assistance (the treatment group) and those who did not (the control group) is the appropriate analytical design.

On this basis, Propensity Score Matching (PSM) was adopted as the principal data analysis technique to compare outcomes between the treatment and control groups based on equal probability of receiving treatment (Austin, 2011; Khandker et al., 2010). The matching process employs Nearest Neighbour, Kernel, and Radius Caliper algorithms, supplemented by balance tests based on Standardised Mean Difference (SMD) and p-values to ensure group comparability and result robustness (Lee, 2013; Maruo et al., 2025). All impact estimates are expressed as Average Treatment Effect on the Treated (ATT), with selection bias reduced through balance validation and common support.

Research data were drawn from the Jakpreneur Information System, which recorded an entrepreneurial population of 368,086 business actors as at the end of 2023. The research subjects comprised a group of facility recipients and a non-recipient comparison group, both of which were official PKT program participants registered by Population Identification Number (NIK). Of these, the facility recipient group in 2023 comprised 13,174 business actors distributed across six city and district areas in DKI Jakarta, consisting of 3,388 participants in sewing machine tools and training and culinary equipment and training; the control group was identified from participants who had not received facilities in the same categories. To maintain validity and reduce bias arising from missing data, only subjects with complete profiles — including outcomes and all key covariates — were included in the analysis, yielding a final sample of 993 craft/fashion business actors and 3,504 culinary business actors. This data restriction was applied to ensure that only observation units with fully recorded outcome variables, treatment assignments, and covariates were included in the matching model. This is essential for the propensity score estimation, matching process, and causal impact analysis to satisfy balance test standards and the Conditional Independence Assumption (CIA) under PSM-based evaluation, while enabling more valid and robust generalisation of results.

The evaluation modeling of the WUIB program was empirically carried out separately for two main groups, namely craft/fashion business actors and culinary business actors. For each sector, the hypothesis was tested by comparing the average outcome in the form of annual turnover () between the treated $\mathrm{Omzet24_i}$group and the non-recipient group (control group) after the pairing matching process, with covariate variables consisting of Asset Value in 2023

(), Number of Workforce in 2023 (), Type of Business proxied by KBLI Category (), Education Level (), Age of business owner (), Age of business owner (), Age Business (), Marital Status (), Owner's Status in the Family () and Gender (). The notation on the WUIB Craft/Fashion model is as follows:$\mathrm{Assset23_i Labour23_i kat\_kbli_i edu_i Age_i OPS_i Marrital_i Fam_i Gender_i}$

$$e_i^{\mathcal{A}} = \mathcal{P}r\left(\mathcal{D}_i^{\mathcal{A}} = 1 \,\middle|\, \mathcal{X}_i^{\mathcal{A}}\right)$$

With:

$\mathcal{X}_i^{\mathcal{A}}$

$= (\mathrm{Asset23}_i^{\mathcal{A}}, \mathrm{Labour23}_i^{\mathcal{A}}, \mathrm{kat\_kbli}_i^{\mathcal{A}}, \mathrm{Edu}_i^{\mathcal{A}}, \mathrm{Age}_i^{\mathcal{A}}, \mathrm{OPS}_i^{\mathcal{A}}, \mathrm{Marrital}_i^{\mathcal{A}}, \mathrm{Fam}_i^{\mathcal{A}}, \mathrm{Gender}_i^{\mathcal{A}})$ represent the covariate vectors used in estimating propensity scores and outcome differences in the WUIB Craft/Fashion model.

The observed outcome $\mathcal{Y}_i^{\mathcal{A}}$ for each individual is notated as

$$\mathcal{Y}_i^{\mathcal{A}} = \begin{cases} \mathrm{Y}_{1\mathrm{i}}^{\mathcal{A}}, & \text{jika } \mathcal{D}_i^{\mathcal{A}} = 1 \text{ (Perlakuan)} \\ \mathrm{Y}_{0\mathrm{i}}^{\mathcal{A}}, & \text{jika } \mathcal{D}_i^{\mathcal{A}} = 0 \quad \text{(Kontrol)} \end{cases}$$

$$\mathcal{Y}_i^{\mathcal{A}} = \mathrm{0mzet24}_i^{\mathcal{A}}$$

where $\mathrm{Y}_{1\mathrm{i}}^{\mathcal{A}}$ and $\mathrm{Y}_{0\mathrm{i}}^{\mathcal{A}}$, each represents the potential outcomes of Craft/Fashion SMEs for individuals with and without treatment represented by the turnover value ($\mathrm{iOmzet24}_i^{\mathcal{A}}$), while it is a binary indicator variable of Craft/fashion SME treatment (1 = receiving treatment; 0 = not receiving treatment).$\mathcal{D}_i^{\mathcal{A}}$

Meanwhile, the notation in the culinary WUIB model is as follows:

$$e_i^{\mathcal{B}} = \mathcal{P}r\left(\mathcal{D}_i^{\mathcal{B}} = 1 \,\middle|\, \mathcal{X}_i^{\mathcal{B}}\right)$$

With:

$\mathcal{X}_i^{\mathcal{B}} = (\mathrm{Asset23}_i^{\mathcal{B}}, \mathrm{Labour23}_i^{\mathcal{B}}, \mathrm{kat\_kbli}_i^{\mathcal{B}}, \mathrm{Edu}_i^{\mathcal{B}}, \mathrm{Age}_i^{\mathcal{B}}, \mathrm{OPS}_i^{\mathcal{B}}, \mathrm{Marrital}_i^{\mathcal{B}}, \mathrm{Fam}_i^{\mathcal{B}}, \mathrm{Gender}_i^{\mathcal{B}})$ represent the covariate vectors used in estimating the propensity score and the difference in outcomes in the Culinary WUIB model.

The observed outcome $\mathcal{Y}_i^{\mathcal{B}}$ for each individual is notated as

$$\mathcal{Y}_i^{\mathcal{B}} = \begin{cases} \mathrm{Y}_{1\mathrm{i}}^{\mathcal{B}}, & \text{jika } \mathcal{D}_i^{\mathcal{B}} = 1 \text{ (Perlakuan)} \\ \mathrm{Y}_{0\mathrm{i}}^{\mathcal{B}}, & \text{jika } \mathcal{D}_i^{\mathcal{B}} = 0 \quad \text{(Kontrol)} \end{cases}$$

$$\mathcal{Y}_i^{\mathcal{B}} = \mathrm{0mzet24}_i^{\mathcal{B}}$$

where $\mathrm{Y}_{1\mathrm{i}}^{\mathcal{B}}$ and $\mathrm{Y}_{0\mathrm{i}}^{\mathcal{B}}$, each represents the potential outcomes of Culinary SMEs for individuals with and without treatment represented by the value of Turnover() while it is a binary indicator variable of Culinary SME treatment (1 = receiving treatment; 0 = not receiving treatment).$\mathrm{iOmzet24}_i^{\mathcal{B}}\mathcal{D}_i^{\mathcal{B}}$

Hypothesis testing was carried out separately for each sector. The zero hypothesis (H_0) states that there is no difference in the average turnover between the groups after the intervention, while the alternative hypothesis (H_1) states that there is a significant difference between the two. The test was carried out at a significance level of 5%, in order to obtain empirical evidence whether the policy of facilitating production facilities/infrastructure has a real impact on improving business performance in each sector.

RESULTS AND DISCUSSION

The analysis procedure in this study begins with estimating the tendency score using PSM, followed by the matching process, testing group balance, calculating the impact of the

program, and assessing the robustness and validity of the results. All of these stages form the basis for interpreting the effectiveness of interventions carried out on target business groups.

The propensity score estimation in this study was carried out using a logit and probit regression model in two sectors, namely craft/fashion and culinary, with the following results.

Table 1. Propensity Score Estimation Results

Estimation	WUIB Craft/Fashion		WUIB Culinary	
Propensity Score	**Logit**	**Probit**	**Logit**	**Probit**
Group				
asset23	0.000	0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)
plough23	0.225**	0.125**	0.085**	0.048**
	(0.115)	(0.059)	(0.040)	(0.023)
Gender	1,675	1.015	1,533	0.935
	(0.217)	(0.128)	(0.115)	(0.068)
kat_kbli	0.009	0.006	-0.103**	-0.061**
	(0.025)	(0.015)	(0.043)	(0.026)
edu2	-0.934	-0.555	-0.132*	-0.078*
	(0.150)	(0.089)	(0.079)	(0.048)
Marrital	0.100	0.065	0.297	0.181
	(0.102)	(0.061)	(0.054)	(0.033)
fam2	-0.073	-0.045	-0.134**	-0.086**
	(0.109)	(0.064)	(0.055)	(0.033)
Age	0.031	0.018	0.003	0.002
	(0.008)	(0.005)	(0.004)	(0.002)
ops	-0.039*	-0.024*	0.043	0.024
	(0.020)	(0.012)	(0.012)	(0.007)
Constant	-2,765	-1,642	-2,990	-1,808
	(0.578)	(0.339)	(0.338)	(0.200)
Observations	993	993	3504	3504
Pseudo R^2	0.1609	0.1605	0.1026	0.1023
LR chi^2	208.77	208.22	491.30	490.01
Prob > chi^2	0.0000	0.0000	0.0000	0.0000
Log likelihood	-544.18	-544.46	-2149.33	-2149.97

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, $p < 0.01$

Source: Author

The results of the estimation of the selection model in this study show that the variables of the number of workers, gender (especially women), and education level are factors that consistently significantly affect the chances of becoming participants in the facilitation program, both in the craft/fashion and culinary sectors. Meanwhile, the variables of business assets, age of owner, family status, and several other additional factors were maintained in the model to maintain a balance of characteristics between the treatment and control groups and to ensure the validity of the matching results, as recommended by the PSM-based policy evaluation methodology (Caliendo & Kopeinig, 2008; Austin, 2011). The validity of the model is reflected in the pseudo R^2 value between 10–16% which represents moderate explanatory power and stability of participant selection results across logit and probit models in the two main sectors of the study. This approach ensures that the program's impact estimates are not distorted by inequality of basic characteristics between groups. The distribution of propensity

scores in the treatment and control groups also shows a wide overlap in the region of common support, as shown in the graph below, so that the entire program impact estimate can be based on a comparison of truly comparable groups and valid. This strengthens the integrity of the causal inference of the study results and minimizes the risk of distortion of findings due to data imbalances that are not completely eliminated.

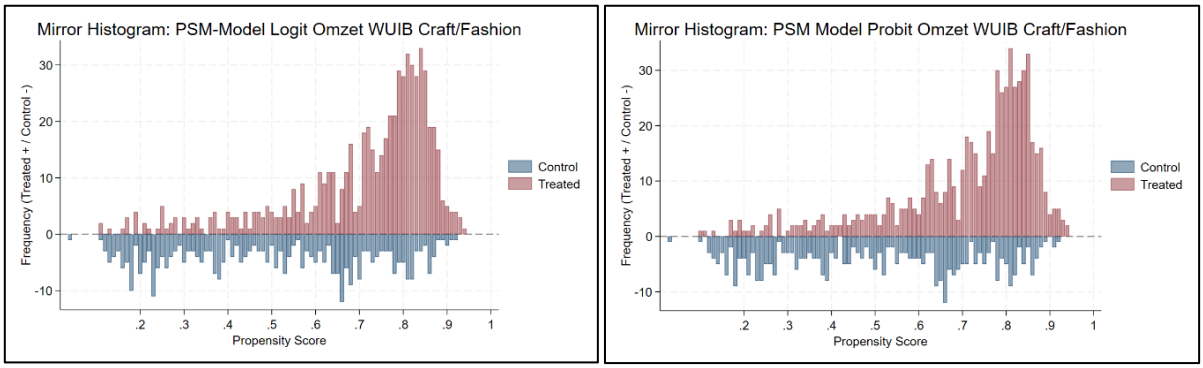


Image 1. Mirrored Histogram WUIB Craft/Fashion

Source: Author

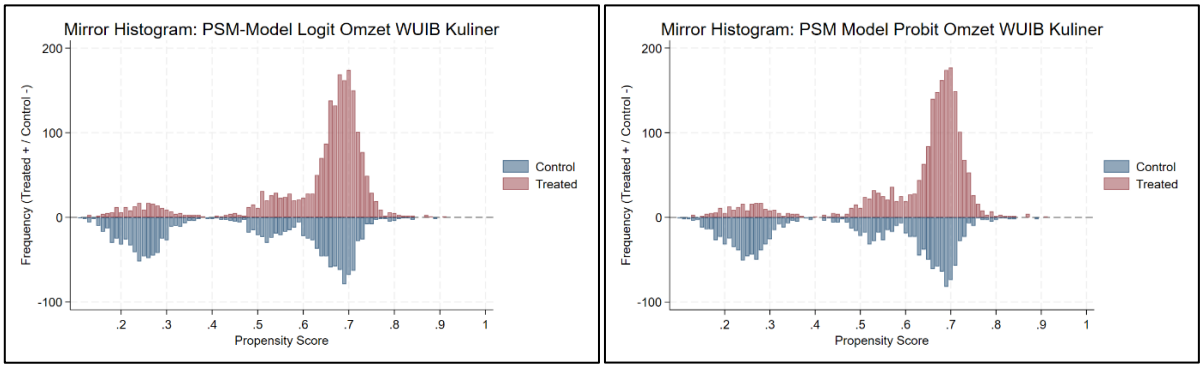
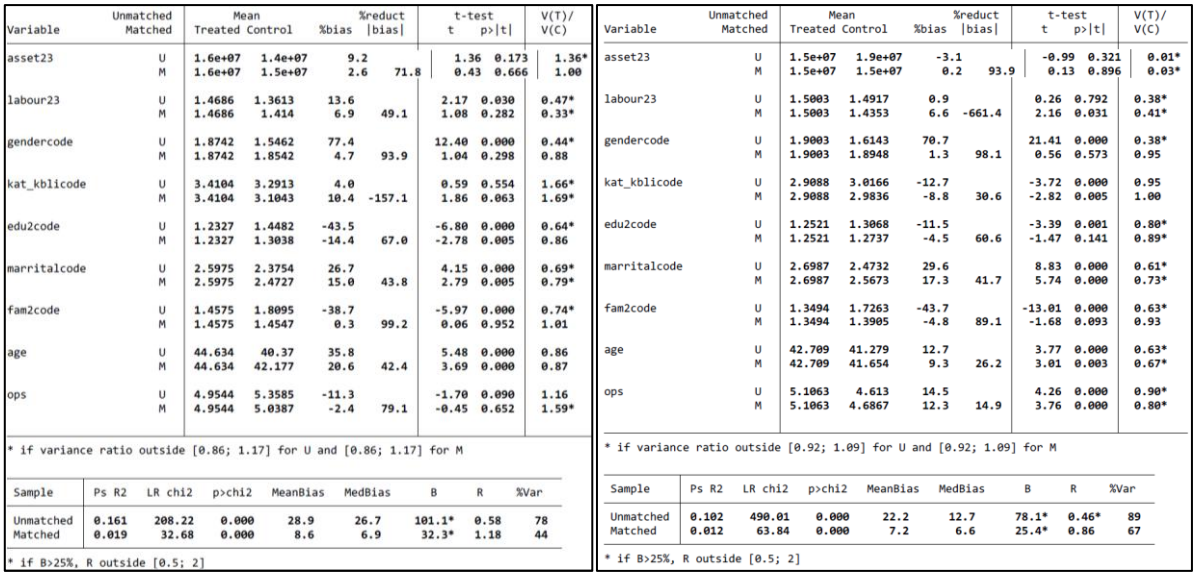


Image 2. Mirrored Histogram WUIB Culinary

Source: Author

The balance test in this study was carried out after the matching process using three main algorithms, namely nearest neighbor, kernel, and radius caliper, to ensure that the matched treatment and control groups really had equivalent characteristics on important variables.



Variable	Unmatched / Matched	Mean Treated	Mean Control	%bias	%reduct |bias|	t-test t	t-test p>|t|	V(T)/V(C)
asset23	U	1.6e+07	1.4e+07	9.2		1.36	0.173	1.36*
	M	1.6e+07	1.5e+07	2.6	71.8	0.43	0.666	1.00
labour23	U	1.4686	1.3613	13.6		2.17	0.030	0.47*
	M	1.4686	1.414	6.9	49.1	1.08	0.282	0.33*
gendercode	U	1.8742	1.5462	77.4		12.40	0.000	0.44*
	M	1.8742	1.8542	4.7	93.9	1.04	0.298	0.88
kat_kblicode	U	3.4104	3.2913	4.0		0.59	0.554	1.66*
	M	3.4104	3.1043	10.4	-157.1	1.86	0.063	1.69*
edu2code	U	1.2327	1.4482	-43.5		-6.80	0.000	0.64*
	M	1.2327	1.3038	-14.4	67.0	-2.78	0.005	0.86
marritalcode	U	2.5975	2.3754	26.7		4.15	0.000	0.69*
	M	2.5975	2.4727	15.0	43.8	2.79	0.005	0.79*
fam2code	U	1.4575	1.8095	-38.7		-5.97	0.000	0.74*
	M	1.4575	1.4547	0.3	99.2	0.06	0.952	1.01
age	U	44.634	40.37	35.8		5.48	0.000	0.86
	M	44.634	42.177	20.6	42.4	3.69	0.000	0.87
ops	U	4.9544	5.3585	-11.3		-1.70	0.090	1.16
	M	4.9544	5.0387	-2.4	79.1	-0.45	0.652	1.59*

* if variance ratio outside [0.86; 1.17] for U and [0.86; 1.17] for M

Sample	Ps R2	LR chi2	p>chi2	MeanBias	MedBias	B	R	%Var
Unmatched	0.161	208.22	0.000	28.9	26.7	101.1*	0.58	78
Matched	0.019	32.68	0.000	8.6	6.9	32.3*	1.18	44

* if B>25%, R outside [0.5; 2]

Variable	Unmatched / Matched	Mean Treated	Mean Control	%bias	%reduct |bias|	t-test t	t-test p>|t|	V(T)/V(C)
asset23	U	1.5e+07	1.9e+07	-3.1		-0.99	0.321	0.01*
	M	1.5e+07	1.5e+07	0.2	93.9	0.13	0.896	0.03*
labour23	U	1.5003	1.4917	0.9		0.26	0.792	0.38*
	M	1.5003	1.4353	6.6	-661.4	2.16	0.031	0.41*
gendercode	U	1.9003	1.6143	70.7		21.41	0.000	0.38*
	M	1.9003	1.8948	1.3	98.1	0.56	0.573	0.95
kat_kblicode	U	2.9088	3.0166	-12.7		-3.72	0.000	0.95
	M	2.9088	2.9836	-8.8	30.6	-2.82	0.005	1.00
edu2code	U	1.2521	1.3068	-11.5		-3.39	0.001	0.80*
	M	1.2521	1.2737	-4.5	60.6	-1.47	0.141	0.89*
marritalcode	U	2.6987	2.4732	29.6		8.83	0.000	0.61*
	M	2.6987	2.5673	17.3	41.7	5.74	0.000	0.73*
fam2code	U	1.3494	1.7263	-43.7		-13.01	0.000	0.63*
	M	1.3494	1.3905	-4.8	89.1	-1.68	0.093	0.93
age	U	42.709	41.279	12.7		3.77	0.000	0.63*
	M	42.709	41.654	9.3	26.2	3.01	0.003	0.67*
ops	U	5.1063	4.613	14.5		4.26	0.000	0.90*
	M	5.1063	4.6867	12.3	14.9	3.76	0.000	0.80*

* if variance ratio outside [0.92; 1.09] for U and [0.92; 1.09] for M

Sample	Ps R2	LR chi2	p>chi2	MeanBias	MedBias	B	R	%Var
Unmatched	0.102	490.01	0.000	22.2	12.7	78.1*	0.46*	89
Matched	0.012	63.84	0.000	7.2	6.6	25.4*	0.86	67

* if B>25%, R outside [0.5; 2]

Image 3. Results Balance Test WUIB Craft/Fashion Model and Culinary WUIB Model

Source: Author

The results of the balance test showed that in most of the main variables, the Standardized Mean Difference (SMD) value after matching fell below the 10% threshold, and the percent bias reduction exceeded 50%, indicating a significant improvement in the covariate distribution between the two groups. However, some category covariates such as marital status and education still sometimes still show residual imbalances, but overall, the matching results have met the equilibrium thresholds commonly used internationally in propensity score-based policy evaluation studies (Markoulidakis et al., 2022; Zhang, Kim, Lonjon, & Zhu, 2019; Austin, 2009).

Program impact estimation is carried out through the measurement of Average Treatment Effect on the Treated (ATT) for each sector as shown in the following table.

Table 2. Recapitulation of Estimated Impact of the WUIB Craft/Fashion Program

Matching	Logit Regression			Regresi Probit		
	Stuart O'Neill	Kernel	Radius Caliper	Stuart O'Neill	Kernel	Radius Caliper
N	993	993	993	993	993	993
ATT	1008775.8	10791763.4	14233293.6	11447503.3	10297616.7	14038332.1
	*	**	***	*	**	***
OR	4889047.9	3486439.9	3192874.8	5346001.1	3475680.0	3190107.5
tstat	2.063	3.095	4.458	2.141	2.963	4.401

t statistics in parentheses

* p < 0.05, ** p < 0.01, *** p < 0.001

Source: Author

Table 3. Recapitulation of the Estimated Impact of the Culinary WUIB Program

Matching	Logit Regression			Regresi Probit		
	Stuart O'Neill	Kernel	Radius Caliper	Stuart O'Neill	Kernel	Radius Caliper
N	3504	3504	3504	3504	3504	3504
ATT	16612325.1 **	12209368.6 ***	12561333.2 ***	11718889.0 *	12190736.5 **	12613574.2 ***
OR	5679620.9	3971644.2	3796104.9	5533786.0	3966732.6	3793301.7
tstat	2.925	3.074	3.309	2.118	3.073	3.325

t statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, $p < 0.001$

Source: Author

The results of the quantitative analysis showed that the craft/fashion MSME group that received the facilitation program experienced an average annual turnover increase of IDR 10-14 million, while the culinary group received an additional turnover of around IDR 11-16 million per year, depending on the PSM algorithm and the estimation model used. All estimation results have a robust significant level of 1–5 percent, supported by high t-statistical values and low standard errors, especially in the kernel and radius caliper methods, thereby increasing the precision and power of statistical inference of program impact. According to Wang, Terabe and Yaginuma (2025), kernel matching gives proportional weight to the control unit based on the proximity of the propensity score, so that the ATT results are more stable and robust across model variations if a balance is achieved. According to Maruo, Yamaguchi, Ishii, and Gosho (2025) show that caliper matching is more reliable when the caliper width is set correctly and the distribution of propensity scores between the treatment and control groups is quite overlapping.

The precision of these results indicates that the observed increase in turnover is not only statistical but also economically relevant, providing strong validation of the effectiveness of the intervention program in the two main sectors that the study is the focus of. The reliability of the results is also supported by the consistency of outcomes across various matching approaches, which emphasizes that the findings truly represent the effectiveness of the intervention and can be the basis for recommendations for future policy improvements (Garrido et al., 2016; Austin, 2011).

In the estimation results that have been presented, the matching approach in both models (WUIB Craft/Fashion and WUIB Culinary) shows significant ATT and t-statistical values (p-value < 0.05), so that the null hypothesis (H_0) can be consistently rejected in almost all analysis methods, especially the kernel matching method and the radius caliper matching method. For this reason, statistically, the evaluated programs have been proven to have a meaningful impact and can be attributed causally to the beneficiary group.

The robustness and validity of the findings were tested by comparing all matching algorithms and the results remained consistent, as emphasized by Austin (2011), Lee (2013), and Maruo et al. (2025), and supported by robust balance diagnostics. The matching process can eliminate selection bias in non-experimental studies and improve causal validity, reinforcing the inference that the additional participant turnover is actually generated by the success of the program, rather than artifacts of different methods or basic characteristics. These results are in line with previous studies using the PSM approach in the evaluation of MSME

programs and affirming the effectiveness of microdata-based production facility policies in urban areas.

CONCLUSION

Based on the empirical analysis carried out, the intervention in the facilitation of production facilities and infrastructure in MSMEs in the culinary and craft/fashion sectors in DKI Jakarta has been proven to have a real positive impact on increasing the annual turnover of business actors who receive programs compared to non-recipient groups of Rp.10-16 million per year. This effect is not only statistically relevant, but also economically significant because it encourages improved purchasing power, additional job creation, and further investment opportunities, especially in businesses that are led by women, have primary-secondary education, or are labor-intensive. Although it is still within the framework of short-term evaluation (short run), it is hoped that there will be a significant multiplier effect phenomenon so that it can affect the improvement of the regional economy.

The empirical limitations that limit this study and can be observed include residual imbalance in several variables (age, marital status, type of business), cross-sectional design and program effect analysis only limited to the WUIB phase without the effects of the business network or other PKT phase effects. These limitations are still a record for interpretation and opportunities for further research with data panels or longitudinal designs as well as design designs that are more multi-effect policy interventions. All of these limitations must be acknowledged, so the interpretation of the results must be careful and leave room for further research.

These findings encourage policymakers to consider the expansion and continuation of similar programs as part of the strategy to strengthen the Jakarta Integrated Entrepreneurship Development (PKT) by focusing on the most responsive groups and strengthening targeting based on participant characteristics data. Academically, it is expected that further research will be developed in a panel and longitudinal manner as well as multi-effect interventions as a form of identification of long-term program effects and suppressing residual bias.

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