

Individual productivity as a key to survival: An integrated structural model of self-regulation, self-motivation, and social cohesion in Thailand's industrial workforce

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Abstract: This study investigates the influence of self-regulation (SR), self-motivation (SM), and social cohesion (SC) on individual productivity (IP) among industrial workers in Thailand. This research responds to the pressing need for organizations to improve workforce performance by focusing on intrinsic factors that support sustainable productivity growth. A quantitative approach was employed, with data collected from 498 workers across six major regions of Thailand and analyzed by SEM in LISREL. The analysis revealed that all three independent variables had statistically significant and positive effects on individual productivity, with SR demonstrating the strongest direct influence ($\beta = 0.33$), followed by SM ($\beta = 0.31$) and SC ($\beta = 0.20$). In addition, SM played a mediating role in the relationship between both SR and IP, as well as between SC and IP. The findings provide practical guidance for human resource management; training programs and HR policies should target these intrinsic factors to boost efficiency without additional labor costs, particularly in industrial sectors facing labor shortages and rising production cost pressures.

Keywords: Individual productivity, Self-motivation, Self-regulation, Social cohesion, Thailand industrial workforce.

1. Introduction

As Thailand's industrial sector faces increasing production costs and external market dynamics, it is becoming increasingly important to understand the factors that support and sustain workforce productivity. Thailand is among the countries significantly affected by labor shortages due to declining birth rates and the transition into a super-aged society. According to the United Nations [1] proportion of the Thai working-age population (ages 15–59) is projected to decline from 62% in 2023 to 50% by 2050, Thai PBS Policy Watch [2] reported. The Office of Industrial Economics (OIE) reported an improvement in the Manufacturing Production Index (MPI) in April 2024 following an 18-month period of contraction. Nevertheless, overall capacity utilization in Thailand's industrial sector remained low at 55.26%, reflecting trends over the past three years and five months (2021–May 2024). Data from the Department of Industrial Works indicate that 3,573 factories have ceased operations during this period, as reported by Chanwit and Thansettakij [3]. Thai manufacturers are also facing intensified competition from low-cost Chinese goods, which are typically priced 20–30% lower. Recently, the United States imposed a new round of tariffs ranging from 25% to 100% on various Chinese products, restricting their access to U.S. and European markets. As a result, Chinese exports are increasingly being diverted to Asian and ASEAN markets, escalating competition within the region, Policy Watch [4] reported. These emerging challenges highlight the need for organizations to adopt effective strategies, such as: increasing workforce productivity and operational efficiency by identifying ways to

achieve higher output without increasing labor; implementing technological innovations or digital transformation; and promoting a multi-tasking workforce culture, in which employees are equipped with versatile skills to ensure functional flexibility during labor shortages or emergencies. Such approaches are essential for enhancing competitiveness and organizational resilience in the face of growing cost-based competition and labor constraints. Alternatively, enhancing employees' intrinsic capacities, such as through psychological development, offers a more sustainable and cost-effective strategy.

This study aims to examine the key factors that promote individual productivity. The researcher anticipates that if organizations can implement strategies or practices that motivate employees to work to their full potential without increasing operational costs, it would allow organizations to enhance productivity using their existing resources. This study focuses on examining three internal psychological and social factors that influence individual productivity: self-regulation, self-motivation, and social cohesion. It aims to provide evidence-based insights for improving individual productivity in Thailand's industrial sector. These factors are intrinsic to the individual and offer a cost-effective alternative to external incentives such as salary increases, physical rewards, or expanded benefits. Enhancing these internal capacities does not significantly increase organizational expenses, making them a strategic focus for sustainable productivity improvement. Moreover, this approach aligns with Thailand's 13th National Economic and Social Development Plan (2023–2027) [5], which emphasizes human-centered development as a foundation for progress in all sectors. By prioritizing human capital development, organizations can foster long-term competitiveness and adaptability in a rapidly evolving economic landscape.

2. Literature Review and Hypothesis

2.1. Conceptual Perspectives on Productivity

Hanjangsit [6] explained that productivity, or the enhancement of productive efficiency, is generally understood through two complementary perspectives. The scientific perspective focuses on maximizing the utility of production resources to achieve optimal output. This approach involves reducing costs, minimizing waste, improving work processes, and emphasizing operational efficiency. In contrast, the socio-economic perspective emphasizes human attitudes and collective effort. This perspective depends on the commitment and cooperation of individuals both within and beyond the organization.

Scientifically, productivity is commonly defined as the ratio of output (goods or services produced) to input (resources used), which may be measured in physical units or monetary value. In formulaic terms: $\text{Productivity} = \text{Output} / \text{Input}$.

Socio-economic perspective, productivity enhancement involves continually seeking ways to improve production and work processes, reduce inefficiencies, and add value to products or services in order to maximize customer satisfaction. According to the European Association of National Productivity Centres, productivity is defined not merely as an outcome but as a mindset or attitude: “a state of mind that seeks continual improvement and innovation, grounded in the belief that today can be better than yesterday and tomorrow better than today.” Productivity, in this view, is driven by a fundamental belief in human potential and progress.

A large-scale study conducted by Krekel et al. [7] titled *Employee Well-being, Productivity, and Firm Performance: Evidence and Case Studies*, examined data from over 1,882,131 employees across organizations in 73 countries. The findings revealed that higher levels of employee satisfaction were significantly associated with improved firm performance. Specifically, organizations with more satisfied employees experienced greater customer loyalty, enhanced employee productivity, increased profitability, and lower staff turnover rates. These results highlight the strategic importance of employee well-being as a driver of organizational success on a global scale. According to Lertnaisat [8], productivity can be defined as the ability to maximize output while minimizing input, particularly time and labor, without compromising performance. High productivity, therefore, means achieving full results with reduced effort. The study highlights three essential factors for enhancing productivity in

the workplace: improving the work environment, fostering employee motivation, and building mutual trust among colleagues. When employees operate in a supportive environment, receive fair evaluations, and establish trust with peers, their productivity is more likely to improve significantly.

Key Indicators: Based on the aforementioned theories and concepts of productivity, this study operationalizes individual productivity through four key dimensions: amount of work completed, efficiency of work, quality of work, and contribution to organizational goals. These dimensions collectively reflect a comprehensive view of individual productivity in the workplace context.

2.2. Self-Regulation (SR) Theoretical foundation:

Self-Control Theory, proposed by Gottfredson and Hirschi [9], explains that individuals with low self-control are more likely to engage in deviant behaviors because they struggle to resist immediate rewards and fail to consider long-term consequences. This lack of self-control often stems from inadequate socialization, especially poor parenting, and typically results in impulsive actions and a short-term focus. The theory has been widely used to understand various forms of deviance, such as crime, substance abuse, and school dropout. It has also guided the development of intervention programs, including parenting support and self-control training. Beyond its applications in criminology, the theory is also relevant in everyday life, especially in the pursuit of goals. Techniques such as managing one's environment and regulating one's thoughts can help individuals avoid procrastination and stay committed to their tasks. In the workplace, self-control contributes to task completion and improved individual productivity. Strengthening self-control skills also enhances motivation, patience, and resilience factors, which are essential not only for personal success but also for improving organizational performance. Goal Setting Theory, developed by Locke and Latham [10], highlights the importance of setting clear and challenging goals to improve motivation and performance. According to the theory, specific and difficult goals are more effective than vague or easy ones because they encourage greater effort, persistence, and personal growth. Locke and Latham emphasize two main characteristics of effective goals: (1) appropriately challenging goals increase motivation by encouraging individuals to exert effort and overcome obstacles, and (2) specific goals provide direction and help individuals focus their actions.

The theory outlines five key principles for effective goal setting:

- **Clarity** - Goals should be clearly defined and easy to understand.
- **Challenge** - Goals should be demanding but achievable.
- **Commitment** - Individuals must be genuinely committed to reaching their goals.
- **Feedback** - Ongoing feedback helps individuals monitor their progress and make necessary adjustments.
- **Task Complexity** - Complex tasks should be broken down into smaller, manageable steps to prevent overload and increase success.

When applied in organizational contexts, goal setting enhances productivity, work quality, and employee engagement. Clearly defined and well-structured goals contribute to long-term organizational success and help build a more motivated and effective workforce. Regulatory Mode Theory, introduced by Kruglanski et al. [11], conceptualizes self-regulation as a dynamic and context-sensitive process shaped by individual goals and situational factors. The theory identifies two distinct modes of self-regulation:

- **Promotion Focus** - This mode is oriented toward achieving positive outcomes, personal advancement, and goal attainment. It includes three key processes:
 - **Goal Setting:** Defining clear, challenging, and meaningful objectives;
 - **Planning:** Organizing and prioritizing tasks to reach desired outcomes;
 - **Monitoring:** Continuously assessing progress and making necessary adjustments.

- Prevention Focus - This mode is concerned with safety, responsibility, and avoiding negative outcomes. It involves:
- Threat Detection: Recognizing potential risks or losses;
- Risk Assessment: Evaluating the likelihood and consequences of those risks;
- Preventive Planning: Formulating strategies to prevent or minimize threats.

This theoretical framework highlights how individuals flexibly apply different self-regulatory approaches depending on the context. It is particularly useful in understanding how people adjust their behavior to align with personal goals and environmental demands. Regulatory Mode Theory thus provides practical insights for designing tailored interventions to enhance self-regulation and improve performance outcomes. Duckworth et al. [12] found that self-regulation was positively associated with academic achievement, demonstrating that students with higher self-regulation skills tend to perform better academically than those with lower self-regulation. Balk and Englert [13] highlighted the critical role of self-regulation in the physical and psychological recovery of athletes, noting that well-developed self-regulatory skills contribute to long-term performance, health, and well-being. Furthermore, Sajeevanie [14] emphasized the importance of self-management as a form of applied self-regulation in achieving personal and professional success. Effective self-management was shown to enhance individuals' ability to control their behavior, manage time, and allocate resources efficiently. The prior empirical research defined self-regulation as a foundational psychological skill that contributes significantly to individual productivity.

Key indicators: Based on the reviewed theories and the empirical research of self-regulation, it is clear that each contributes valuable insights into the core variables explored in this study. These theories collectively emphasize the importance of individual capacities such as setting clear goals, developing effective plans, engaging in regular self-monitoring, demonstrating perseverance when facing challenges, and regulating emotions under stress. When organizations foster these self-regulatory skills among employees, individuals are more likely to interpret work-related challenges as attainable, which, in turn, enhances intrinsic motivation and drives improved performance at both personal and organizational levels. Accordingly, this study investigates the influence of self-regulation on individual productivity and self-motivation, focusing on five key dimensions: Goal Setting, Planning, Monitoring, Patience, and Emotional Regulation and Stress Management. Informed by this theoretical foundation, the following hypothesis is proposed to guide the empirical investigation.

H₁: Self-regulation exerts a positive influence on individual productivity.

H₂: Self-regulation exerts a positive influence on self-motivation.

2.3. Self-Motivation (SM) Theoretical Foundation

Self-Determination Theory (SDT), developed by Deci and Ryan [15], offers a foundational framework for understanding human motivation based on intrinsic psychological needs. The theory originated from Deci's [16] experiment, which demonstrated that external rewards such as monetary incentives could diminish intrinsic motivation. Participants who were paid to complete puzzles showed less interest once the reward was removed, suggesting that external reinforcement can undermine internal drive. SDT is built on two central assumptions: individuals have a natural tendency toward growth and self-improvement, and motivation is more sustainable when it is self-directed rather than externally imposed. The theory identifies three basic psychological needs: autonomy (a sense of control over one's actions), competence (a sense of effectiveness), and relatedness (a sense of connection with others). When these needs are satisfied, individuals tend to exhibit greater motivation, engagement, and psychological well-being. In organizational settings, SDT emphasizes that employees who feel autonomous and capable are more likely to be intrinsically motivated, committed to their work, and resilient to stress or burnout. Unlike extrinsic motivators, intrinsic motivation, driven by interest, purpose, or enjoyment, has a more profound and lasting impact on individual productivity and job satisfaction. Flow Theory, developed by Csikszentmihalyi [17], refers to an optimal psychological state

in which individuals are fully engaged in an activity, experiencing deep concentration, intrinsic motivation, and enjoyment. The theory highlights the importance of balancing task challenge with personal skill. When this balance is achieved, individuals enter a state of “flow,” which enhances both performance and satisfaction. Flow occurs when the task is neither too easy nor too difficult, allowing individuals to remain focused and productive while feeling a sense of accomplishment. In workplace settings, Flow Theory suggests that managers can enhance employee engagement by aligning task difficulty with employee competence. When this balance is achieved, individuals are more likely to enter a flow state, resulting in increased motivation, improved individual productivity, and greater contribution to organizational goals. Sabir [18] investigated the impact of motivation on employee performance and found that highly motivated employees exhibit greater commitment and effort, leading to increased productivity. Similarly, Kuswati [19] conducted a study involving 123 employees from a private company in Indonesia and reported a positive correlation between motivation and job performance. Motivated employees demonstrated higher levels of dedication, which translated into improved work outcomes. Further support comes from Provitera [20], who developed a model integrating productivity, individual performance, and motivation to assess both the positive and negative outcomes of motivational processes. His findings suggest that motivation is a critical determinant of individual output; those with higher motivation tend to exert more effort and show stronger goal commitment. The prior empirical research emphasizing the role of motivation in enhancing employee performance indicates that self-motivation plays a pivotal role in improving individual productivity in organizational settings.

Key indicators: Based on the reviewed motivation theories and empirical research, it is clear that several internal factors contribute to the development of self-motivation. These include engaging in meaningful work, taking on challenging tasks, setting clear and attainable goals, and having autonomy in task execution. Such elements stimulate an individual’s intrinsic drive to succeed, thereby enhancing individual productivity and, in turn, supporting organizational performance. This underscores the critical role of intrinsic motivation, referred to here as self-motivation, in influencing work outcomes at both individual and organizational levels. Consistent with the objectives of this study, the research aims to investigate the influence of self-motivation on individual productivity through four key dimensions: interest, challenge, need for achievement, and autonomy. These dimensions reflect essential motivational drivers that, when effectively supported, can foster higher engagement, persistence, and work performance. Based on this theoretical foundation, the following hypotheses are proposed for this study.

H₃: Self-Motivation Exerts a Positive Influence on Individual Productivity.

2.4. Social Cohesion (SC) Theoretical Foundation

Social Capital Theory, introduced by Putnam [21], proposes that social capital is a valuable resource derived from relationships within social networks. It supports goal achievement, collaboration, and collective success by fostering trust, shared norms, and social connections. Social capital is generally categorized into three dimensions: Network Social Capital - interpersonal connections that provide access to information, support, and opportunities; Trust Social Capital - confidence in others to act fairly and cooperatively, which strengthens teamwork; and Norm Social Capital - shared values and expectations that encourage mutual respect and accountability. The presence of strong social capital enhances goal attainment, increases work efficiency, and improves both individual and group productivity. Therefore, cultivating social capital within organizations or communities can lead to meaningful improvements in both individual outcomes and broader organizational performance. Structural Functionalism, Parsons [22], grounded in structural functionalism, the focus is on the roles of social structures in fulfilling the needs of a society. Parsons proposed that society functions through a set of subsystems (economic, political, socialization, and cultural), and that social action is guided by shared norms and values. The AGIL framework, Adaptation, Goal attainment, Integration, and Latency (pattern maintenance), illustrates how each subsystem contributes to the stability and functionality of

society. Parsons' approach highlights the interdependence of institutions and the normative expectations that enable society to function smoothly. Within this framework, social cohesion acts as a stabilizing force, helping individuals internalize shared norms, values, and expectations. These shared understandings encourage consistent behavior, self-regulation, and a commitment to collective goals. Parsons argued that social integration provides the normative structure necessary for shaping individual motivation and behavior. When individuals feel a sense of belonging to a group, they are more likely to act in self-regulated ways, guided by internal goals rather than external pressure. This alignment between personal and group objectives promotes self-motivation and productivity, as individuals contribute to maintaining social stability and achieving common outcomes. In this way, Structural Functionalism highlights social cohesion as a key condition for fostering self-discipline and intrinsic motivation, both of which are essential for sustained personal and organizational performance. CFRs: Conversations, Feedback, and Recognition are strategic tools introduced by Doerr [23] to complement traditional performance frameworks such as OKRs. Designed to promote employee engagement and alignment, CFRs emphasize human-centered communication that supports learning and productivity. Conversations involve focused, empathetic dialogues between managers and employees, reinforcing clarity and mutual understanding. Drawing from Drucker's insights, meaningful one-on-one discussions can significantly improve employee performance. Feedback refers to two-way, constructive input that encourages growth and accountability. A culture of open feedback fosters continuous improvement and builds trust within teams. Recognition, the most emotionally impactful component, enhances morale by affirming effort and commitment. Regular acknowledgment fosters belonging and motivates sustained contribution. Collectively, CFRs cultivate a supportive organizational climate by strengthening interpersonal connections, promoting motivation, and aligning individual effort with organizational goals. When practiced consistently, CFRs enhance psychological safety and drive long-term performance and innovation. Özer and Karabulut [24] demonstrated that organizational support significantly predicts team task cohesion and team effectiveness, both of which contribute to project success. This is consistent with Jung [25], who found that strong family relationships positively influenced the self-control capabilities of older adults. Similarly, Miao and Ma [26] reported that self-regulated learning and social presence significantly enhanced students' learning engagement in online educational environments. Brajsa-Zganec et al. [27] emphasized the role of social support, family cohesion, self-regulation strategies, and self-esteem in predicting the well-being and life satisfaction of nursing students. The prior empirical research and theories affirm the multidimensional role of social cohesion in enhancing psychological regulation, motivation, and ultimately, individual performance outcomes.

Key indicators: the aforementioned theories and the empirical research underscore the interconnectedness among social cohesion, self-regulation, and intrinsic motivation, all of which contribute to enhanced individual productivity. This study explores how social cohesion influences self-regulation and self-motivation, which, in turn, impact individual work performance. Social cohesion is conceptualized through four core dimensions: Belonging, Trust, Collaboration, and Social Recognition and Feedback. By fostering a socially supportive environment, social cohesion is expected to enhance employees' capacity to set goals, maintain focus, and persist through challenges, ultimately improving both individual and organizational outcomes. In line with the theoretical foundations reviewed, this study proposes a series of direct and mediating hypotheses that examine the pathways through which social cohesion contributes to self-regulation, self-motivation, and individual productivity as follows.

H₁: Social Cohesion exerts a positive influence on Self-motivation.

H₂: Social Cohesion exerts a positive influence on Individual productivity.

H₃: Social Cohesion exerts a positive influence on Self-regulation.

From the study of these theories, the researcher developed a conceptual framework to illustrate the relationships between all variables and link them to hypotheses, as shown in Figure 1.

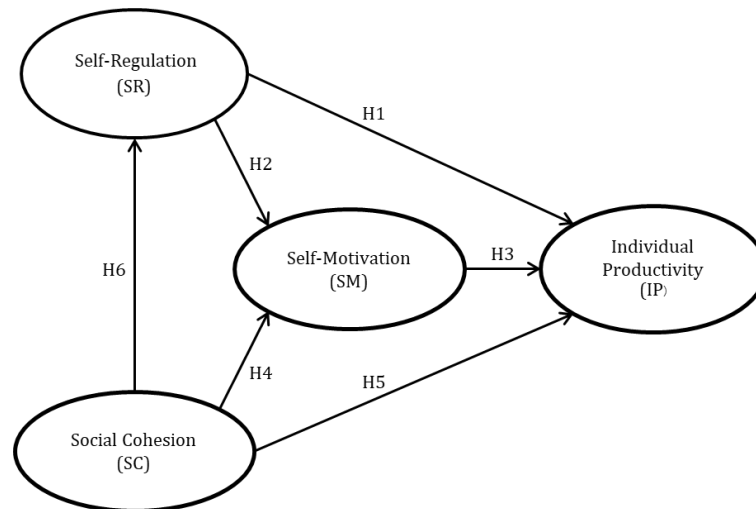


Figure 1.
Conceptual Framework Showing Proposed Hypothesis.

2.5. Research Gap

Despite extensive studies on self-regulation and social cohesion separately, few investigations integrate these constructs with self-motivation within a unified SEM framework in emerging economies. This study addresses this gap by testing an integrated model among Thai industrial workers.

3. Methodology

3.1. Data Collection and Sampling

In this study, the researcher employed purposive sampling, specifically using criterion sampling, to select participants. Data were collected through questionnaires in sufficient quantities for Structural Equation Modeling (SEM) statistical analysis. The sample comprised employed individuals in Thailand who met the following criteria: (1) aged 18 years and older, and (2) currently working in establishments located within the industrial estates governed by the Industrial Estate Authority of Thailand (IEAT) across various regions of the country. The sample size was determined based on the statistical requirements of Structural Equation Modeling (SEM). Following the rule of thumb suggested in SEM literature, Kline [28], the recommended sample size ranges from 10 to 20 cases per observed variable. In this study, there are 17 observed variables; a sample of 170–340 is required. In this study, 498 questionnaires were fully completed and deemed valid for analysis.

3.2. Instrument Development

The questionnaire employed a 5-point Likert rating scale. The development process followed Churchill Jr [29]. Instrument Construction consists of independent variables: SR (5 indicators): goal setting, planning, monitoring, patience, emotional regulation, and stress management; SC (4 indicators): belonging, trust, collaboration, and social recognition and feedback. Mediator variable: SM (4 indicators): interest, challenge, need for achievement, and autonomy. Dependent variable: IP (4 indicators): amount of work completed, efficiency of work, quality of work, and contribution to organizational goals. Instrument Validation, according to Rovinelli and Hambleton [30], an IOC value above 0.50 indicates acceptable alignment between an item and its measurement objective. In this study, expert evaluations showed IOC values ranging from 0.66 to 1.00, confirming that the questionnaire items were valid and aligned with the research objectives. In this study, the researcher conducted a reliability test by performing a try-out of the research questionnaire with a group of 34 individuals who were not part of the main sample but shared similar characteristics [31]. The statistical analysis was

conducted using SPSS software to calculate Cronbach's Alpha. The result showed a Cronbach's Alpha coefficient of 0.973, which is well above the commonly accepted threshold of 0.70. This indicates that the questionnaire has a very high level of internal consistency and is therefore considered highly reliable for data collection in this study.

4. Results

4.1. Demographic and Descriptive Statistics

From the total sample of 498 completed respondents, representing Thailand's industrial workforce, 60.6% were male and 39.4% were female. The majority were aged 26–35 years (35.3%) and 36–45 years (33.9%). In terms of educational attainment, 59.8% held a bachelor's degree. Most participants were employed in industrial estates located in the Eastern region of Thailand (49.6%), followed by those in the Central region (26.3%). Additionally, 74.5% of the respondents were employed in the industrial goods manufacturing sector. The analysis results include descriptive statistics, normality assessment, and validity of variables, as shown in Table 1. Data from all observed variables have a normal distribution because the values of skewness and kurtosis are close to zero. According to Schumacker's criteria, both values are not more than ± 1.00 and ± 1.50 , respectively, indicating that the data collected are suitable for analysis with parametric statistics. The normality of data distribution was assessed using the Kolmogorov-Smirnov test, which is appropriate for sample sizes larger than 50 Kanlaya [32]. The results for all 17 observed variables indicated normal distribution patterns. These findings confirm that the observed variables are suitable for Structural Equation Modeling (SEM).

Table 1.
Descriptive statistics, Normality assessment, and Validity of variables.

Observed Variable	Statistical Values						Kolmogorov-Smirnov test		Interpretation Criteria $\bar{X}$
	$\bar{X}$	S.D.	MIN	MAX	SK	KU	Statistic Chi-square	P-value	
avGoal	4.126	0.536	2.60	5.00	-0.197	-0.496	2.130	0.000	High
avPlan	4.308	0.504	2.80	5.00	-0.395	-0.570	2.736	0.000	Very High
avMoni	4.245	0.524	2.20	5.00	-0.344	-0.054	2.363	0.000	Very High
avPati	4.198	0.583	2.33	5.00	-0.362	-0.353	3.297	0.000	High
avEmo	3.937	0.638	1.50	5.00	-0.109	-0.148	4.466	0.000	High
avBelong	4.001	0.573	2.00	5.00	-0.055	-0.360	2.973	0.000	High
avTrust	4.208	0.600	2.33	5.00	-0.302	-0.544	3.655	0.000	Very High
avColla	4.360	0.589	2.67	5.00	-0.557	-0.490	4.336	0.000	Very High
avSocial	4.114	0.620	2.00	5.00	-0.226	-0.403	4.769	0.000	High
avIntere	4.321	0.564	2.67	5.00	-0.438	-0.524	3.510	0.000	Very High
avChalle	4.292	0.560	2.00	5.00	-0.535	-0.082	2.756	0.000	Very High
avNeed	4.332	0.573	3.00	5.00	-0.337	-0.819	4.224	0.000	Very High
avAuton	3.928	0.652	1.00	5.00	-0.317	0.379	3.257	0.000	High
avAmount	3.905	0.609	2.00	5.00	-0.091	-0.361	4.004	0.000	High
avEffi	4.023	0.597	2.50	5.00	-0.082	-0.377	4.825	0.000	High
avQuali	4.146	0.579	2.50	5.00	-0.137	-0.381	5.679	0.000	High
avContri	4.061	0.617	2.50	5.00	-0.099	-0.485	5.318	0.000	High

4.2. The results of SEM analysis

The results of the structural equation modeling (SEM) correlation coefficients, as shown in Table 2 and Figure 2, confirm that SR, SM, and SC have both direct and indirect effects on IP among industrial workers in Thailand.

Direct Effects: SR→IP ($\beta = 0.33^{**}$), SM→IP ($\beta = 0.35^{**}$), SC→IP ($\beta = 0.20^*$)

Indirect Effects: SR→IP via SM ($\beta = 0.10^{**}$), SC→IP via SM & SR ($\beta = 0.56^{**}$)

Total Effects: SR→IP = 0.43^{**} , SC→IP = 0.76^{**}

Table 2.
SEM Correlations and Path Coefficients of SR, SC, and SM on IP.

Independents Variable	Dependents Variable								
	SR			SM			IP		
	TE	IE	DE	TE	IE	DE	TE	IE	DE
SC	0.82** (0.06)	-	0.82** (0.06)	0.84** (0.07)	0.24** (0.06)	0.59** (0.07)	0.76** (0.06)	0.56** (0.10)	0.20* (0.06)
SR	-	-	-	0.30** (0.10)	-	0.30** (0.10)	0.43** (0.13)	0.10** (0.05)	0.33** (0.13)
SM	0.30** (0.10)	-	0.30** (0.10)	-	-	-	0.35** (0.09)	-	0.35** (0.09)

Note: Chi-Square=89.07, df=83, P=0.30, RMSEA=0.012, SRMR=0.22, CFI=1.00, GFI=0.98, AGFI=0.96

*P<0.05 **P<0.01 TE = Total Effect, IE = Indirect Effect, DE = Direct Effect.

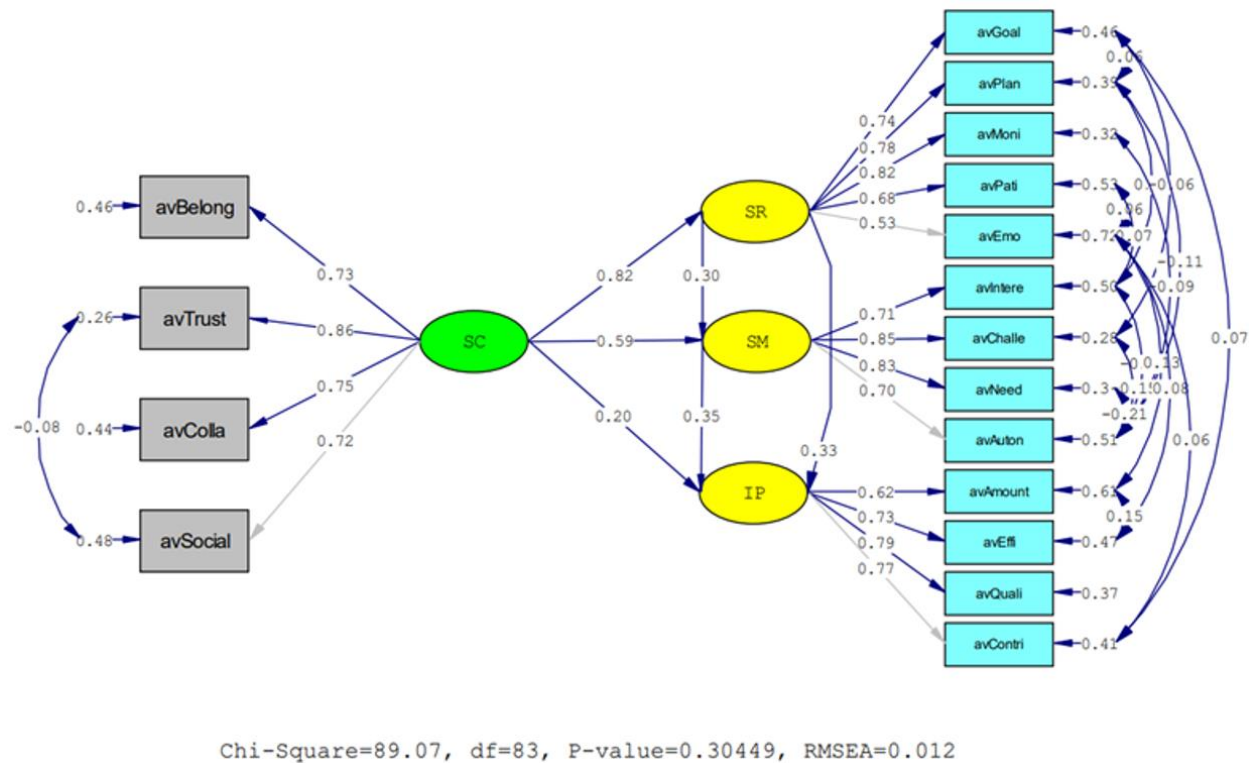


Figure 2.
The Structural Equation Model: the relationships among SR, SM, SC, and IP.

These results underscore the importance of psychological and social factors in enhancing productivity within Thailand's industrial workforce and provide strong empirical support for the proposed theoretical model. Overall, the path analysis confirms the interconnected roles of social, motivational, and regulatory factors in driving individual productivity in industrial work settings. All six hypothesized relationships were supported by the data, as summarized in Table 3.

Table 3.
Summary of Hypothesis Testing Results.

Hypothesis	Accepted	Rejected
H1: Self-regulation exerts a positive influence on individual productivity.	✓	
H2: Self-regulation exerts a positive influence on self-motivation.	✓	
H3: Self-motivation exerts a positive influence on individual productivity.	✓	
H4: Social Cohesion exerts a positive influence on Self-motivation.	✓	
H5: Social Cohesion exerts a positive influence on Individual productivity.	✓	
H6: Social Cohesion exerts a positive influence on Self-regulation.	✓	

5. Discussion

5.1. Theoretical Implications

The results of this study indicate that the application of internal psychological and social drivers: Self-regulation (SR), Self-motivation (SM), and Social cohesion (SC) significantly influences Individual productivity (IP) among industrial workers in Thailand. The findings are consistent with prior empirical research that self-regulation is a foundational psychological skill that contributes significantly to individual productivity across diverse domains. This study corroborates the conclusion that self-motivation plays a pivotal role in enhancing individual productivity in organizational settings, and these findings affirm the multidimensional role of social cohesion in enhancing psychological regulation, motivation, and ultimately, individual performance outcomes. The results demonstrate that individuals are more productive when their tasks align with intrinsic goals such as the need for achievement, autonomy, relatedness, collaboration, and trust, consistent with Self-Determination Theory Deci and Ryan [15] and Social Capital Theory Putnam [21]. Moreover, the findings suggest that optimal challenges enhance motivation and significantly improve individual productivity when organizations leverage the optimal challenge within the flow channel, in line with Flow Theory, Csikszentmihalyi [17]. Additionally, the findings expand upon Regulatory Mode Theory, Kruglanski et al. [11] by showing that, in a collectivist cultural context, social cohesion not only facilitates locomotion (goal-directed action) but also protects against assessment paralysis (over-analysis), thereby enhancing motivational outcomes. Overall, this study integrates psychological and sociological factors into a unified framework for understanding individual productivity.

5.2. Practical Implications

The results from this study offer low-cost strategies for improving labor efficiency. They not only strengthen operational efficiency but also position organizations to remain resilient and competitive in a global market increasingly shaped by cost-driven trade dynamics and resource constraints. Based on the findings of this study, the recommendations are applicable to business enterprises and relevant organizations, particularly for developing strategies aimed at enhancing individual productivity, which ultimately contributes to organizational performance.

- **Development of Self-Regulation Training Programs:** Organizations should utilize these findings to design capacity-building programs that promote self-regulation skills among employees, including goal setting, work planning, task monitoring, patience, and emotional and stress management. Workshops focused on “Self-Regulation” or “Self-Motivation” could be introduced, as these competencies are empirically linked to improved work efficiency and productivity.
- **Integration into HR Competency Assessments:** Human resource departments can apply the validated questionnaire from this study to assess individual employees’ strengths and weaknesses. These insights can inform tailored competency development plans based on levels of self-regulation and self-motivation. Moreover, workplace environments should be structured to foster a sense of belonging, trust, collaboration, and appropriate social recognition, as these factors enhance internal motivational resources. Organizations are encouraged to implement personal development tracking systems to monitor and support employees’ growth systematically.

- **Designing Intrinsic Motivation Systems:** Organizations should promote job designs that emphasize intrinsic motivators such as meaningful, challenging tasks, visible career progression, and autonomy in work management. Techniques such as job enrichment and empowerment can be employed to align job responsibilities with employees' interests, thereby enhancing self-motivation, fostering engagement, and driving both high-quality performance and personal growth.
- **Application of the Structural Equation Model (SEM):** The SEM model developed in this research offers a framework for behavior-based employee performance evaluations. It enables the design of new Key Performance Indicators (KPIs) that reflect internal psychological constructs, such as self-regulation, self-motivation, and social cohesion, thus providing a more holistic measure of individual productivity.

These insights advance both theoretical and empirical knowledge by providing a multidimensional framework for developing strategic interventions that foster productivity enhancement in the industrial sector. Moreover, the proposed model and findings have practical applicability beyond the industrial context and can inform workforce management strategies in other sectors as well. Crucially, the study illustrates that organizations can improve individual productivity without incurring additional labor costs simply by leveraging internal psychological and social resources. The results of this study confirm that enhancing output through increased personal productivity while maintaining a stable workforce offers a sustainable approach to addressing the dual pressures of intensifying cost competition and looming labor shortages.

5.3. Limitations

This research employed a purely quantitative approach, which may not fully capture qualitative dimensions such as emotions, organizational culture, and context-specific perceptions. To gain deeper insight into these qualitative factors, future studies are encouraged to adopt mixed-methods designs, including in-depth interviews, focus groups, or other qualitative techniques, to enrich the interpretation and validity of the findings. The use of self-report questionnaires may have introduced bias; incorporating multiple sources of data could enhance accuracy, such as employees' performance records and administrative data, to validate the findings. The theoretical framework of this study was limited to select constructs related to self-regulation, motivation, self-motivation, social cohesion, and productivity. This study focused primarily on intrinsic psychological factors among industrial workers in Thailand.

5.4. Future Research

This study focused on the influence of self-regulation, self-motivation, and social cohesion on individual productivity among industrial workers in Thailand, primarily from the industrial goods manufacturing sector. While the findings demonstrated significant positive influence, future research should explore other organizational contexts such as SMEs, micro SMEs, public agencies, and non-profit organizations, both within and beyond Thailand, or sector-specific comparisons (e.g., service vs. industrial) to enhance generalizability. Future research should consider integrating other relevant theories and constructs, such as leadership and organizational climate, to further develop a more comprehensive and applicable model across different contexts. Future research should explore the interaction between intrinsic and extrinsic motivation; investigating this balance may help identify optimal strategies for enhancing productivity. Experimental studies across diverse sectors and cultural contexts are also recommended, as different norms, leadership styles, and personal characteristics may significantly influence the relationships between the studied variables, such as investigating the potential moderating effects of leadership style or organizational climate on the relationship between self-regulation and individual productivity.

Transparency:

The authors confirm that the manuscript is an honest, accurate, and transparent account of the study; that no vital features of the study have been omitted; and that any discrepancies from the study as planned have been explained. This study followed all ethical practices during writing.

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