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Torm, Nina

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# To what extent is social security spending associated with better firm level performance?

## A case study of SMEs in Indonesia

Nina Torm

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### Abstract

The relationship between social protection and enterprise performance is much debated in the literature, and evidence is particularly limited in the case of small and medium-sized enterprises in developing economies. This paper examines how the provision of social security influenced business performance in Indonesia using census data from 2010 to 2014. We found that increased social security spending of 10 per cent is associated with a per-worker revenue gain of up to 2 per cent. Moreover, profits did not decrease due to the increased social protection coverage, suggesting that increasing worker benefits may be a worthwhile business investment.

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## 1. Introduction

The Social Protection Floors Recommendation 2012 (No. 202) adopted by the International Labour Organization (ILO) in 2012 recognizes the importance of national social protection floors, and aims to ensure effective access to at least essential health care and a basic level of income security as a matter of priority (ILO, 2012). As such, the recommendation provides the first international legal instrument explicitly recognizing the triple role of social security as a universal human right and an economic and social necessity (ILO, 2014). The first World Social Protection Report 2014/15 further urged that social protection be an important part of the post-2015 development agenda (ILO, 2014)<sup>1</sup>, and the commitment to building social security systems, including floors, is reflected in the 2030 Agenda for Sustainable Development (ILO, 2017). This recent drive towards the provision of universal social protection has also led to the emergence of innovative approaches to adapt social protection systems to better address different types of employment (including non-standard forms of employment) and facilitate the transition from the informal to the formal economy (Behrendt and Nguyen, 2018; ILO 2018; ILO, 2016; ILO, 2017).<sup>2</sup>

Regional associations like that of the Association of Southeast Asian Nations (ASEAN), of which Indonesia is a member state, have with the 2013 Declaration on Strengthening Social Protection also expressed their commitment towards ensuring social protection. Within ASEAN, the provision of social protection varies considerably, yet most countries, including Indonesia, have an established contributory-based scheme for social health insurance for formal-economy employees. Around half of the working populations in Indonesia, Malaysia, the Philippines, Singapore and Viet Nam participate in old-age pension schemes or provident funds (ILO, 2015). For coverage to be extended and enhanced, however, there is need for further evidence on the association between employer-contributed social security and business performance, especially for micro, small and medium-sized enterprises (MSMEs).<sup>3</sup> In Indonesia, MSMEs represent more than 99 per cent of the total number of enterprises and absorb approximately 97 per cent of the total workforce. MSMEs are thus major drivers of economic development, contributing around 60.3 per cent of Indonesia's gross domestic product (GDP) value in 2016.<sup>4</sup> The number of MSMEs is continuously growing. In the third quarter of 2017 alone, the growth rate was 2.3 per cent (BPS, 2017).

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<sup>1</sup> One of the key objectives of the World Social Protection Report (2014; 2017) is to provide a mechanism for monitoring progress towards the realization of the Social Protection Floor Recommendation.

<sup>2</sup> At the 2015 International Labour Conference, the ILO adopted recommendation nr. 204 on transitioning from informality to formality, and currently the ILO is drafting a guide on extending social protection to the informal economy (ILO, 2019 forthcoming)

<sup>3</sup> Although in the case of Indonesia, it is relevant to talk about MSMEs (micro, small and medium-sized enterprises), the data on which this paper is based covers SMEs. Throughout the paper, both terms are used, depending on the context.

<sup>4</sup> Ministry of Cooperative, Small and Medium Enterprises website, [www.depkop.go.id](http://www.depkop.go.id) (accessed 5 Oct. 2018).

Despite their economic importance, smaller enterprises, particularly informal ones, experience a number of challenges, and workers generally have limited access to social security. The latter may be due to a combination of factors, including a hesitation on behalf of employers to invest in their workforce, especially given that small and medium-sized enterprises (SMEs) often operate according to a short-term horizon. Likewise, workers may be hesitant to contribute to social insurance if they do not see the short-term benefits and are not risk-averse. However, if interpreted as a form of deferred compensation, social security payments might be considered more tangible to workers and more accepted by employers because the latter would, in the absence of any contributions, be obliged to pay wages that are correspondingly higher – at least in theory.

Another factor limiting social security provision is lack of information on existing schemes as well as limited knowledge of the existing legal framework. The Indonesian Government has made numerous efforts to promote awareness and extend social insurance to MSMEs, including to those in the informal sector through voluntary schemes. Although the provision of social protection constitutes a key responsibility of governments and employers as well as a basic human right, there is an absence of substantial evidence documenting whether social security is actually beneficial to enterprises, in particular for smaller firms.

In the case of Viet Nam, evidence indicates that when enterprises join the formal sector, they earn higher profits and employ more permanent workers (Rand and Torm, 2012). And when formal enterprises see an increase in the share of workers receiving social security, per worker revenue and profits both rise, especially in the long run (Lee and Torm, 2017).<sup>5</sup>

This study on Indonesia adopted a similar approach as Lee and Torm (2017) and found that when the per-worker amount that enterprises spent on social security rose by 10 per cent, then revenue increased by between 0.4 per cent and 1.8 per cent, depending on the specification. In terms of profits, there is no indication that contributing to social security leads to lower profits per worker, at least when unobserved enterprise-specific factors are accounted for.

The following section presents a selective overview of the literature, followed by a discussion of the Indonesian context in section 3. Section 4 describes the data and the variables included in the empirical analysis for this study, and section 5 outlines the methodology. The results, including robustness checks, are presented in section 6 and section 7 concludes with a policy recommendation.

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<sup>5</sup> Having recently reduced the qualifying period for social insurance coverage from three months to one month, Vietnam provides a positive example of how to improve the situation for workers on temporary contracts (ILO, 2018).

## 2. Literature

Seen through the lens of neoclassical economics and its assumptions of well-functioning labour markets, perfect information and fully enforced contracts, the inherent conflict between employers' and employees' interests implies that the former will generally seek to minimize any employment-related costs, such as the (mandated) provision of social benefits. Even if these somewhat unrealistic theoretical assumptions are relaxed and labour markets are characterized by some rigidity and imperfect information, a trade-off inevitably exists between the costs of employer-provided social protection and the benefits accrued through improved working conditions. The central question thus centres on where the balance lies.<sup>6</sup> The trade-off may be particularly important and visible in the case of smaller enterprises, which often operate in an environment characterized by high entry and exit rates and are therefore more vulnerable to changing policy conditions. Given their short-term perspective smaller enterprises are likely only to invest in improved working conditions if they find it economically worthwhile in the short run. Moreover, in a developing country context, improved compliance and monitoring of regulations is particularly important in order to ensure fair competition and a "level playing field" for all firms.

For the purpose of this paper and going beyond the simple neoclassic framework and its focus mostly on the labour-demand side, we draw on alternative theories that also consider the labour-supply side and are relevant for addressing the relationship between working conditions and enterprise performance in the context of SMEs.<sup>7</sup> The first such framework is the so-called "bundles of human resource management practices" that encapsulate a variety of elements, including recruitment and selection, performance appraisal, performance-based pay, training and development, employee voice, participation, information sharing and "strategic people management" (Sheehan, 2013). Due to their complementarity and combined ability to convey clear, coherent and comprehensive messages to employees, such bundles have been shown to provide an explanation for strong links between workplace practices and outcomes (Gooderham, Parry and Ringdal, 2008; Macduffie, 1995).<sup>8</sup>

In an extensive review of some 65 studies (mostly covering developed countries), Subramony (2009) identified three broad categories of human resource management bundles, which he found to be particularly successful: employee empowerment, motivation and skill enhancement. All three themes relate to working conditions in general. Social protection initiatives fall under motivation-enhancing practices, along with other employee benefits, performance-linked pay, etc., all of which

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<sup>6</sup> The evidence emerging from the vast minimum wage literature, for instance, ranges from substantial dis-employment to no or even positive employment effects as a result of minimum wage changes.

<sup>7</sup> See Croucher et al., 2013, for an international review of studies on working conditions and enterprise performance.

<sup>8</sup> Cutcher-Gershenfeld (1991) show how such bundles are more effective than individual practices.

have been found to affect business outcomes through higher effort levels when employees are adequately rewarded for their performance (Stajkovic and Luthans, 2003).

A second but related approach is the resource-based view, which, as the name indicates, emphasizes the treatment of employees as valuable assets and points to the potential financial gains and increased competitiveness associated with workforce protection (Barney, 1991). However, its application to small companies has been criticized for the neglect of external factors, to which small enterprises are particularly sensitive (Arregle et al., 2007; Sirmon and Hitt, 2003). In addition, the importance of management's strategic capacity in developing and deploying resources to maximize results means that the resource-based approach may have limited value in certain country contexts.

In tackling some of these concerns, a third concept, "dynamic capabilities", highlights the ability of SMEs to "integrate, build and reconfigure internal and external competencies to address the rapidly changing environments" (Teece, Pisano and Shuen, 1997). This ability to respond to the demands from, for instance, new customers or labour-related regulations is particularly important to small enterprises and their vulnerability to a changing external environment. By contrast to the resource-based view, this theory has been successfully applied to developing countries (Malik and Kotabe, 2009), including small enterprises (Døving and Gooderham, 2008).

A fourth approach is social equity theory, which has its origins in Akerlof's (1982) concept of the gift-exchange nature of employment arrangements, whereby exchange is based on reciprocity and trust and relations are endogenously determined. Based on this notion of employment as a "social exchange" (Blau, 1964), the availability of various inducements (pay, benefits, internal mobility, etc.), make employees perceive their workplace as valuing their contributions (Allen, Shore and Griffith, 2003; Rhoades and Eisenberger, 2002). This creates a more positive attitude among employees (Wayne et al., 2002), thereby improving enterprise performance in terms of productivity and sales (Schneider et al., 2005). In other words, rather than individual efforts, it is the social setting and effective coordination and interactions among workers, work groups or departments and between management and workers that explain the continuous improvements in productivity (Buchele and Christiansen, 1999).

All four theories contain aspects that are related to each other, and portray the added value of social protection for employers/enterprises in terms of enhancing human capital and/or human capabilities. However, the applicability of such theories to SMEs in developing countries remains scarce, with most of the exploratory academic work covering developed countries where compliance with the legal framework is more complete and consistent. Nevertheless, for the purpose of this paper, the different approaches provide useful reference points when discussing the results in section

6. In the following section, we discuss why Indonesia provides an interesting case for studying the enterprise-level effects of social protection contributions.

### 3. Background

#### 3.1 Micro, small and medium-sized enterprises

In an attempt to recognize the important role of small enterprises, the Indonesian Government enacted Law No. 20 in 2008 to support the development of MSMEs through capacity building, business promotion and financial support. The law groups enterprises into categories based on both assets and gross income, as indicated in table 1 (columns 1 and 2). In addition to the financial classifications specified in the legal framework, Statistics Indonesia (BPS) categorizes MSMEs according to number of workers, as indicated in column 3, which differs from the World Bank's size thresholds (column 4).

Despite their major contribution to GDP and employment growth, Indonesian MSMEs endure several challenges. One of the most important is access to capital: 60–70 per cent of MSMEs have limited access to financial institutions (and their financing opportunities) (Ministry of Industry, 2015). In addition, poorly designed regulations and policies constrain MSMEs from obtaining their legal status and, according to a World Bank study, cumbersome bureaucratic procedures discourage the legalization of MSMEs and thus relegate them to remaining in the informal sector. Other constraints include weak infrastructure, difficulty obtaining business licences and permits, tax rates and political instability (World Bank, 2015).<sup>9</sup> It is also harder for MSMEs to keep up with new technology, new information, high-quality resources and modern management practices. And, as emphasized in this paper, MSMEs suffer from limited access to social security.

#### 3.2 Social security system

Indonesia's social security system dates to 1977 when work injury insurance, death benefit and old-age savings were introduced through Government Regulation No. 33 on Social Insurance for Workers (known as the Astek (Asuransi Tenaga Kerja) system). The schemes cover private and state-owned enterprises that have not registered their employees for private insurance. The coverage targets employers with ten or more employees or employers paying workers a salary of more than 1 million rupiah (IDR) per month (as specified in Government Regulation No. 14 on the Implementation

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<sup>9</sup> Since this paper focuses only on formal sector enterprises, I do not engage with the vast literature on determinants of informality and informal-formal transitions. However, in a recent study of cross-national variations (covering 142 countries), Williams and Kadir (2018) find that the prevalence of informal sector entrepreneurship is mainly associated with underlying structural economic and social conditions such as the lack of trust in the state, extensive corruption in the public sector, lack of procedural fairness and redistributive justice, etc. Therefore, they argue for state intervention at the macro-level to address the determinants of informal entrepreneurship, rather than dealing merely with the effects through for instance providing incentives ("carrots") to encourage formal entrepreneurship or punishing informal firms ("sticks") by e.g. increasing sanctions and risks of detection.



of Social Security for Workers, 1993). With a subsequent Law No. 3 (on Jaminan Sosial Tenaga Kerja (Jamsostek), or worker's social security system) enacted in 1992, the social security scheme was extended to include health insurance, and all components are mandatory for workers in the formal sector and voluntary for self-employed workers and workers in the informal economy.

In 2004, when the Social Security Law (No. 40) was enforced, pension benefits for all workers was added to the list of schemes (table 2). The implementation of the five schemes as regulated by Law No. 24 (2011), formed the basis for establishing two social security providers in Indonesia under the Social Security Administrator for Health (BPJS): one for health and targeting all citizens and the other one for employment and targeting all workers.

According to the newest legal framework, both wage workers (formal) and non-wage earners (informal) are covered by the social security legislation with the purpose of increasing the social protection of informal workers. However, as with voluntary schemes in other countries in the region coverage rates are very limited. An International Labour Organization study on Social Security for Informal Economy Workers in Indonesia (ILO, 2010) found that 80 per cent of the respondents did not have any formal form of social security, and half of them did not want to acquire formal insurance, mostly because they were unable to pay for it. Rather, family was their main source of support. In addition to the cost issue, the hesitation to contribute to the social insurance scheme partly related to a lack of understanding of risks, as evidenced by a study on MSME employers and workers (Ramadhana and Amir, 2012) that found that respondents who had experienced a work injury did not consider such incident as a major risk factor. In fact, the evidence revealed that a large share of workers (42.4 per cent) preferred not to do anything to mitigate the work injury risks (Adillah and Anik, 2015). In short, the contribution rate was considered higher than the risk of being injured on the job and hence was seen as an additional expense or burden for workers.

Another factor is lack of information. Despite efforts to increase awareness about the BPJS Employment benefit programme, crucial information has not yet reached all MSMEs. A 2015 study conducted in Semarang found that around 40 per cent of respondents (mostly informal sector workers) were unaware of the scheme (Adillah and Anik, 2015). One of the most effective ways to promote the BPJS Employment programme is through the provision of administrative sanctions, including written warning and an order limiting or freezing business activities to enterprises that do not comply with the regulations. However, this type of administrative sanction does not apply to the many MSMEs that operate informally. Alternative promotional efforts to reach informal workers were initiated recently by BPJS Employment, including potential collaboration with various informal-workers' associations and cooperatives to improve the dissemination of information and to support self-employed workers. Despite steps to improve social security coverage for smaller enterprises,

challenges remain, in particular for those in the informal sector.<sup>10</sup> For this study, however, I focus on the formal segment of SMEs, as the following section explains.

## 4. Data

The data used in this paper comes from the Indonesia Manufacturing Survey (census), which BPS has carried out since 1975, covering all formal manufacturing enterprises with 20 or more workers. Thus, it excludes smaller enterprises, many of which operate outside the legal framework.<sup>11</sup> That the survey only covered formal enterprises was not a concern for our analysis because informal enterprises are not within the scope of compulsory (formal) social insurance provision. We used data from 2010 to 2014 because the information on pension contribution, social allowance, insurance, etc. was only included in the questionnaire from 2010 onwards. During this time period, the manufacturing sector was the largest sector, contributing about 24 per cent of GDP and accounting for around 20 per cent of total non-agricultural employment in Indonesia (Sakernas, 2016; BPS, 2014). We categorized enterprises within the manufacturing sector by industrial subsectors, based on the United Nations standard industrial classification (ISIC Revision 4). The ability to track companies over time made it possible to construct a balanced panel of enterprises, which allowed for a more accurate analysis.

### 4.1 Data samples and key variables

The main indicator for measuring social security provision is the annual per-worker amount the enterprise spends on pension contribution, social allowance, insurance, etc.<sup>12</sup> (henceforth referred to as social security). This can be seen as one way of measuring the degree of formalization within registered enterprises. Thus, in a sense, this study examines the benefits of formalization within formal enterprises.<sup>13</sup> For the analysis and to ensure that the results are not driven by reverse causality, we used the lagged social security contribution (as well as lagged performance variables). Because this variable was only introduced in 2010, the time period considered was 2011–14.

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<sup>10</sup> ILO (2018) provides a comprehensive review of innovative policy responses that various countries have employed to better adapt their social protection systems to previously unprotected workers including those in the informal sector. In the case of Indonesia the review highlights an example from the service sector.

<sup>11</sup> As outlined in the previous section, there are two classification systems for MSMEs in Indonesia. By the size definition, micro and small enterprises (fewer than 20 workers) are exempt from pension schemes, and micro enterprises and other workers (including construction workers, self-employed and informal workers) can only register for the work injury and death benefit. However, the Indonesia Manufacturing Survey covers enterprises with 20 or more workers, which are covered by the social security system. To capture “small” enterprises for this study, we used the World Bank classification of SMEs: Micro enterprises have between one and ten employees; small-scale enterprises have between 11 and 50 employees; and medium-scale enterprises have between 51 and 300 employees. Thus, all micro and some small enterprises are not covered by the survey. To capture enterprise dynamics, we did not exclude enterprises that were categorized as large (with 300 employees or more) in any one year.

<sup>12</sup> This covers social health insurance and compensation when an employee is giving birth or has a parent who died (social allowance). Maternity, sick leave and severance pay are not included in this measure.

<sup>13</sup> This study did not examine the direct impact of existing regulations because the data set on which the analysis was based did not provide information on whether enterprises purposely comply with the law (or not) or are merely providing social security regardless of the law.

For indicators of enterprise performance (outcome variables), we used (i) total revenue per worker and (ii) total profit per worker. Throughout the analysis, we controlled for a number of standard enterprise characteristics (outlined in the following section) that affect both social security provision and enterprise performance. To take account of unobserved enterprise-specific features (fixed effects), we used the balanced panel, including only enterprises that appeared in all five years. After following the cleaning criteria outlined in Appendix A, we concluded with 17,216 observations for the unbalanced panel and 6,092 observations in the balanced panel (1,523 in each of the four years). The substantial difference in the number of observations between the unbalanced panel and the balanced panel was due to the relatively high entry and exit rates among SMEs and because many enterprises did not provide information on all the relevant variables in all years.

## 4.2 Descriptive statistics

Table 3 provides the summary statistics of all the variables used in the analysis, based on the unbalanced panel of enterprises.<sup>14</sup> First, our variable of interest, the per-worker social security contribution, was IDR1.9 million per year, which rose over time despite a dip in 2013 (in both real and nominal terms).<sup>15</sup> As for the outcome variable, the per-worker revenue followed the same pattern, averaging IDR778 million annually over the whole period, dropping slightly in 2013 and then picking up again in 2014.<sup>16</sup> Unlike revenue and social contributions, nominal profits per worker did not dip in 2013, indicating that spending was reduced, which is true at least in terms of wages (discussed further on). In real terms, however, there was a decrease. Average profits over the period were IDR300 million annually. In all the specifications, eight control variables were introduced: (i) enterprise size; (ii) legal status; (iii) location; (v) sector; (vi) female share; (vii) average wage; and (viii) previous performance, which the following elaborates on.

**Enterprise size:** Rauch (1991) extended Lucas' model (1988) of the enterprise size distribution of heterogeneous workers to show that when larger enterprises experience higher unit input costs, the most talented entrepreneurs tend to operate at a level that exploits their productive advantage, thus generating higher profits. Higher input costs may include social security or other non-wage costs.<sup>17</sup> We therefore included the log of the number of regular full-time employees to ensure that any association between social security contribution and enterprise performance was not driven by enterprise size. Enterprise size may, to some extent, capture any ability bias arising if, in accordance

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<sup>14</sup> Descriptive statistics for the balanced panel revealed no major differences in the variable distributions. Results are available upon request.

<sup>15</sup> Equivalent to USD 133 per year (1 USD = 14,318.39 IDR; as off 13-08-19).

<sup>16</sup> We intentionally avoid using gross value added as our productivity measure because the social security contribution is linked to the wage level (which is part of the gross value added).

<sup>17</sup> A closer look at the data revealed that the social security share varied substantially by enterprise size category, with around 28 per cent for micro enterprises, 47 per cent for small enterprises, 56 per cent for medium-sized enterprises and 67 per cent for large enterprises (results available upon request).

with Rauch (1991), the more skilled entrepreneurs are also the ones setting up larger enterprises. In our sample, the average enterprise size was 316 workers, indicating the presence of some large enterprises. Medium-sized enterprises (between 50 and 300 workers) constituted the largest share, with around 47 per cent of the sample, followed by small enterprises (10–50 employees), at around 29 per cent of the sample. Large enterprises constituted 24 per cent of the sample.

**Legal categories:** To account for performance differences across different ownership structures and the considerable variation between social security compliance and legal status, we include four legal categories; government owned enterprises (central and local), domestic private enterprises and foreign-owned enterprises.<sup>18</sup> The categorization was based on enterprises owning more than 50 per cent of the capital. In general, enterprises that are involved in foreign trade would be expected to have greater exposure to global initiatives, such as corporate social responsibility, and thus be more likely to comply with related regulations. The ratios were stable over time, with 80 per cent being private enterprises, followed by 16 per cent foreign- owned enterprises and 4 per cent government-owned companies.

**Location:** To account for price and other differences between provinces, we included 33 provincial indicators. Because urban areas are found in all provinces, provinces cannot be classified as strictly urban or rural. Based on the Labour Force Survey data (2016), we categorized urban provinces as those for which the proportion of the working-age population in urban areas was more than 50 per cent. This included the provinces of DKI Jakarta, Kepulauan Riau, Jawa Barat, Yogyakarta, Banten, Kalimantan Timur, Bali, Sumatera Utara, Jawa Timur and Sulawesi Utara. Thus, 74 per cent of enterprises were located in urban areas, and the slight variation over time was due to this being based on the unbalanced panel including exit and entry enterprises. In the balanced panel, the location was fixed because we only considered repeat enterprises.

**Sector or industry:** To account for productive differentials across industries, we included sector dummies. The summary statistics show that low-value-added manufacturing represented 43 per cent of enterprises, while medium-value-added manufacturing accounted for about 39 per cent of enterprises, and high-value-added level was 18 per cent.<sup>19</sup> These shares were relatively stable over time. Yet, within each grouping, there was some variation, which is why we included the full set of 18 sector dummies in all the specifications in the empirical analysis.

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<sup>18</sup> Zhu et al. (2008) also found that ownership structure is an important determinant of human resource practices more generally.

<sup>19</sup> Low-value-added sectors include food and beverages, tobacco, textiles and apparel, leather and wood and paper. Medium-value-added sectors include publishing and printing, refined petroleum, chemical products and pharmaceuticals, rubber, non-metallic mineral products, basic metals, fabricated metal products, electronic machinery, computers, radio, TV and motor vehicles. High-value-added sectors include other transport equipment, furniture, jewelry, music equipment, watches, toys and medical equipment.

**Share of female employment:** We included the share of female workers to account for gender-attributed productivity differentials, which are particularly common in developing countries (Jones, 2001). While some studies found that the gender wage gap was related to variations in labour market experience across gender (Blau and Kahn, 2006; Altonji and Blank, 1999), others pointed to gender differences in attitudes towards competition.<sup>20</sup> Another interpretation is that the wage gap reflects discrimination against women in the labour market.<sup>21</sup> The proportion of women in the summary statistics is 35 per cent and rather stable over time.

**Average wages:** The average real wage was introduced because social security contributions are linked to the wage level. The inclusion of wages should also account for any correlation between the average education level in an enterprise (which we did not observe) and productivity (Lucas, 1988). In other words, the average wage acts as a proxy for the general quality of the workforce. To reduce multicollinearity caused by the linkage of the wage to both social security provision and enterprise performance, we used the district-average (per worker) wage and grouped it by industrial sector and enterprise size category. Table 3 shows that the average nominal wage was around IDR22 million annually. With the exception of the dip in 2013, it was generally rising over time, in line with the other financial variables.<sup>22</sup>

**Previous performance:** Because performance expectations may affect both current performance and whether an enterprise decides to contribute to the social security schemes, we included a variable for previous performance (measured by revenue growth or change in the previous period). This fluctuated substantially over the time period, averaging at IDR53 million.

## 5. Methodology

To understand the relationship between social security and enterprise performance, we first looked at the determinants of social security using a simple logit model, in which the outcome is a binary variable taking the value 1 if social security is provided and 0 otherwise. The enterprise-level control variables were those described in the previous section.

For the main analysis, we examined the relationship between social security provision and per-worker enterprise revenue by estimating the equation:

$$(1) \ln Y_{jt} = \alpha + X_{jt-1} + S_{jt-1} + \varepsilon_{jt}$$

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<sup>20</sup> For instance, Dohmen and Falk (2011) and Niederle and Vesterlund (2007) found that women generally avoided variable pay schemes (and these schemes tended to raise productivity).

<sup>21</sup> Hellerstein, Neumark and Troske (1999) found that the gender wage gap in the United States was not entirely attributable to productivity differentials; and in Viet Nam, Liu (2004) found that the gender wage gap during the 1990s was attributable in large part to workplace discrimination against women.

<sup>22</sup> Reassuringly, these figures were much in line with national wage statistics for the same period (BPS, 2014).

In (1),  $\ln Y_{jt}$  is the log of (real) revenue or profit per worker at enterprise  $j$  at time  $t$ , which depends on a vector of mostly lagged enterprise-level covariates ( $X_{jt-1}$ ), which affect either enterprise performance or the provision of social security (or both). Our variable of interest is the per-worker social security contribution in the previous period ( $S_{jt-1}$ ). We also included an enterprise-level error component.

To avoid reverse causality, which would occur if those enterprises that are performing well in turn provide social security, we used the lagged value of our variable of interest (per-worker social security contribution in the previous survey year). Allowing for a time lag ensured that the performance impacts were a result of the social security contribution, once other factors were controlled for. We also included lagged values of enterprise size, female share, average wages and past performance. In addition to using the standard ordinary least squares (OLS) estimation, we also controlled for fixed effects to address the bias that may arise from the presence of unobserved enterprise heterogeneity, such as owner ability, which may influence both performance and social security provision. As with any analysis of repeated observations over time, there was the possibility of autocorrelation, which could lead to biased results. To resolve this, the standard errors were clustered at the enterprise level throughout the analysis, thereby allowing for intragroup (within enterprise) correlation over time. Finally, year dummies were included in all specifications.

## 6. Results

With regard to the determinants of social security, table 4 indicates that large private and foreign-owned enterprises with high (lagged) average wages are more likely to contribute towards social security, as would be expected. Also, enterprises that previously performed well are more likely to contribute to their workers' social security protection, which points to the importance of controlling for previous performance in assessing the relationship between social security provision and current enterprise performance. In contrast with a similar study on Viet Nam (Lee and Torm, 2017), the share of female workers was negatively associated with the provision of social security, which suggests that, in Indonesia, male business owners are more generous than female owners when it comes to providing social security coverage. Enterprises located in primarily urban areas are more likely to provide social protection, and compared with low-value-added sectors, enterprises in high- and medium-value-added sectors are more likely to contribute to social security, although not statistically significantly.

Table 5 shows the OLS results based on equation (2), in which the outcome variable is the log of (real) revenue per worker. As controls in the first specification (column 1), we included enterprise size, legal status indicators, location, sector indicators and year dummies. The results show that our variable of interest (social security per worker) was significantly positively related to enterprise

revenue. More specifically, a 10 per cent increase in the per-worker social security contribution was associated with a 1.7 per cent increase in average revenue. In column 2, we extended the set of controls to include, in addition to the above, the female share, average wage and past performance; as a result, the coefficient on social security fell to 1.3 per cent. In terms of the controls, as expected, larger enterprises had a higher revenue, as do foreign-owned enterprises due to the export link. Local government-owned enterprises have a lower revenue per worker when compared with central government-owned enterprises, and private enterprises had higher returns, although interestingly, this only became significant in the second specification when previous performance was accounted for (which itself is highly positively significant). The share of female workers negatively correlated with performance, and our measure of the average workforce quality (average wage by location, sector and enterprise size) was well determined and positive, as expected.

Table 6 presents the results based on the balanced panel in which the first two columns correspond to table 5 and the last column is the fixed-effect specification. Again, in all specifications, social security spending per worker was positive and highly significant, showing that a 10 per cent increase in average social security led to a 1.8 per cent increase in average revenue and 1.4 per cent in column 2. The comparability of the coefficients to those in table 5 is reassuring, and the slightly higher estimates in table 6 point to more established (surviving) enterprises having a stronger correlation between social security provision and revenue per worker.

When accounting for unobserved enterprise-specific factors (column 3), such as owner ability and/or motivation, the magnitude fell, indicating that unobserved heterogeneity correlates positively with the provision of social insurance. This implies that higher-ability owners are more likely to pay social insurance for their workers, which is not surprising. However, the coefficient remained positively significant (at the 1 per cent level), with a 10 per cent increase in average social security leading to a 0.4 per cent increase in average revenue. Thus, the positive relationship between the provision of social security and revenue of the enterprise was **not** driven exclusively by unobserved heterogeneity.

As for the controls, these are all as expected and in line with table 5, except that the female share and private enterprises were no longer significant, once we controlled for fixed effect. Enterprise size turned negative, implying that once owner ability is accounted for, larger enterprises actually have lower revenue per worker.

In general, the findings indicate that paying social security contribution is beneficial in terms of enterprise revenue. However, because the analysis up to this point did not take account of the cost of expanding the social security coverage, we now consider how social security provision relates to

enterprise profits.<sup>23</sup> The specifications and control sets were identical to those for revenue, with the exception that we included lagged profit growth as our measure of past performance.

Table A1 in the Appendix presents the results, based on the balanced panel. When past performance and average wages were controlled for (column 2), there was no significant relationship between our variable of interest and profits. As expected, average wages were highly negatively related to profits, and performance (lagged profit growth) in the previous period was significantly positive. Larger enterprises were more profitable, as were enterprises with a larger female workforce share. The latter stands in contrast to the lower revenue associated with female workers. A possible explanation for this is that women receive lower wages than men (therefore, lowering enterprise expenditures) perhaps as a reflection of different job functions, which thus explains lower revenue.<sup>24</sup>

Also, in contrast to the revenue results, private and foreign-owned enterprises were less profitable when compared with the government-owned companies, again potentially due to the former having higher labour costs. In the fixed-effect specification in column 3, the social security coefficient remained insignificant, and the only variable that was well determined when enterprise-specific factors were accounted for was lagged profit growth. Thus, the indication of gender differences along both the profit and revenue dimension disappear once unobserved enterprise-specific factors are accounted for. All in all, there is no evidence that enterprises that contribute to social security experience lower profits per worker, which is reassuring, given that social security is an added cost to the enterprise.

In terms of what drove the positive performance results, one plausible explanation is that social security provisions lead to enhanced workforce effort either by enterprises being able to attract more motivated employees and/or by raising the motivation of their existing workers. This is in line with several of the alternative theories discussed in section 2, including human resource management bundles, dynamic capabilities and social equity or exchange theory. The use of average wages as a proxy for the general quality of the workforce strongly suggests that the channel through which social benefits lead to enhanced performance is likely to be through higher job satisfaction and/or commitment rather than as a result of simple measurable skills.<sup>25</sup> Another possibility is that more socially aware enterprises benefit from cooperation with larger, more globally connected companies

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<sup>23</sup> Profits were calculated by subtracting expenditures from revenue in the financial accounts data and then dividing by enterprise size to obtain per-worker profits.

<sup>24</sup> When using firm level wages (as a proxy for productivity) instead of the district-average (per worker) wage, grouped by industrial sector and enterprise size category, the results remain qualitatively and quantitatively the same, both in terms of revenue and profit outcomes. Thus, variations in average wages/productivity across firms do not influence the extent to which social security contributions are associated with firm gains.

<sup>25</sup> It could also be that enterprises investing in the social well-being of their workers also provide them enterprise-based training, which affects workers' and therefore the enterprise's performance (Bjerge, Torm and Trifkovic, 2016). Because there is no information on training in the survey, we cannot check for this.



with strong commitments to corporate social responsibility and/or that require compliance with labour regulations, which boosts their performance.<sup>26</sup>

### Robustness checks

To check the robustness of our results, we divided the sample into three enterprise-size categories: small, medium and large, amounting to 31 per cent, 44 per cent and 25 per cent of the sample, respectively. Appendix tables A2 and A3 show the results for revenue and profits, respectively, both based on the balanced-panel fixed-effect specification (equivalent to column 3 in table 4).

In terms of revenue, we found a positive and significant correlation for all enterprise sizes. Interestingly, small enterprises had the highest return on social security provision, with a 10 per cent increase in the provision of social security leading to a 0.4 per cent increase in revenue per worker, which was the same as in the overall analysis (column 3 in table 4). For medium and large enterprises, the coefficient was slightly smaller, at 0.3 and 0.36, respectively. Yet, for the former, the correlation was more significant, given that medium-sized enterprises constituted the largest size segment. That small enterprises had a higher revenue return on investments in social security is indicative of their ability to adjust to changing conditions along the lines of the “dynamic capabilities” approach.<sup>27</sup> It is highly plausible that worker effort and output in small enterprises was more visible and employees therefore felt more valued and motivated to perform in response to an improvement in their conditions. As for profits, we found that the variable of interest was not well determined in any of the size categories, confirming the overall finding that enterprises that contribute to their workers’ social security coverage do not have lower profits per worker (table A3). In line with the revenue findings, however, small enterprises had the highest coefficient.

Tables A4 and A5 present the results broken down by legal status of enterprises. We examined both the unbalanced (OLS) and balanced panels (fixed effect) because the latter panel was very small for some of the legal groupings. In table A4, all legal types, with the exception of central government enterprises, exhibited significant positive revenue returns to social security contribution, and, as expected, the coefficients were lower in the fixed-effects specifications (panel B) when compared with the OLS (panel A).

Interestingly and despite their low representation, the coefficient was particularly high for local government-owned enterprises, with a 10 per cent increase in social security leading to a 0.9 per cent increase in revenue per worker, once fixed effects were accounted for (table A4, panel B).

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<sup>26</sup> Because the data set did not allow us to observe the composition of enterprises’ supplier and customer networks, we were unable to investigate this further.

<sup>27</sup> Because enterprise size is controlled for within the different size category specifications, the differences in social security return are not due to an enterprise-size revenue effect, whereby there are diminishing returns as enterprises grow. However, we are unable to know the extent to which this is driven by different workers.

However, statistically, the results were more robust for domestic private and foreign-owned enterprises, which constituted the majority of the sample (80 per cent and 16 per cent, respectively). Regarding profits, the negative coefficients shown in columns 3 and 4 (table A5), for domestic and foreign enterprises, respectively, disappeared when enterprise fixed effects were accounted for in the last two columns (5 and 6), which is in line with the overall profit results in table A1.

Finally, we divided the sample into the seven main industries: food and beverages, textiles, apparel, chemical products, rubber, electronic machinery and furniture.<sup>28</sup> With regard to revenue, the (OLS) results from the unbalanced panel presented in table 6A show that there is a positive and significant correlation across all sectors. The coefficient is particularly high for chemical products and pharmaceuticals, whereby a 10 per cent increase in social security is associated with a 1.7 per cent increase in revenue per worker. In terms of profits, table A7 reveals that for chemical products and pharmaceuticals, a 10 per cent increase in social security is associated with a 0.3 per cent increase in profit per worker. For textiles and electronic machinery, the relationship is negative. However, the significance disappears when enterprise fixed effects are accounted for (results available upon request).<sup>29</sup> Thus, there seems to be some variation across different industries in the manufacturing sector.

In sum, based on the different divisions, the overall results presented in the previous section are indeed robust and reflect enterprises across different size, legal and sector categories.

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<sup>28</sup> These seven sectors each had more than 1,000 observations, allowing for meaningful regression analysis. See table A6 for the specific number of observations for each sector.

<sup>29</sup> Due to the reduction in the number of observations, the **fixed-effect** revenue specifications are only well determined for the larger sectors (food and beverages, chemical products and pharmaceuticals, and furniture). In terms of profits, none of the fixed-effect specifications are significant, as expected (results available upon request).

## 7. Conclusion

Based on census data of registered manufacturing enterprises with more than 20 employees, this paper analyses how enterprise-level provision of social security influenced enterprise performance in Indonesia from 2010 to 2014. This is an interesting period to examine, given both a growing international recognition of the broader potential of social protection, in particular following the economic crisis of 2008–9, and the fact that the Indonesian social security system has undergone a number of changes in the last decade or so. Currently, the different components of Indonesia's social protection provision are work injury, death benefit, old-age savings, health insurance and a pension scheme, as regulated under Law No. 24 (2011). However, micro and some small enterprises (fewer than 20 workers) are exempt from the pension scheme, and micro enterprises and other workers (including construction workers, self-employed and informal workers) can only register for the work injury and death benefit schemes.

For this paper, we defined social security provision as the per-worker amount the enterprise spent on pension contributions, social allowance and insurance, while the outcomes variable is the per-worker revenue and profit. Using standard regression techniques, we found that enterprises that increased their social security spending by 10 per cent experienced a per-worker revenue gain of up to 2 per cent. When unobserved heterogeneity was accounted for in the balanced panel of enterprises, the magnitude dropped but remained positively significant, indicating that higher-ability owners are more likely to pay social insurance for the workers, which is not surprising.

The return was particularly high for smaller enterprises and for local government-owned enterprises. However, statistically the results were more robust for private domestic and foreign-owned enterprises because they constitute the majority of the sample. There was also some variation in the social security-revenue relationship across different sectors. In general, though, the various divisions supported the main results.

Finally, there was no evidence that enterprises that contributed to the social security system experienced lower profits per worker, which suggests that increasing worker benefits may be a worthwhile enterprise investment. With regard to what is driving the positive performance results, one plausible explanation is that social security provisions lead to enhanced workforce effort, either by enterprises being able to attract more motivated employees and/or by raising the motivation of their existing workers. This is in accordance with the theories of human resource management

bundles, dynamic capabilities and social equity or exchange theory. Another explanation could be that more socially aware enterprises benefit from cooperation with larger, globally connected companies that are committed to corporate social responsibility and/or require compliance with labour regulations. Overall, social security provision seems to be beneficial to workers as well as enterprises. The question then remains how to incentivize enterprises to make social security contributions.

Given that social security contributions are often paid in conjunction with taxes, which generally are higher than social security payments, one option would be to offer tax breaks or subsidies, especially to newly operating and smaller enterprises that are generally more resource-constrained and short-sighted in their business approach. This might enable employers to utilize more resources towards investing in their workforce.

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## Appendix A

### Data-cleaning procedure

To arrive at the final sample used in the analysis, we employed the following criteria:

1. Enterprises that have missing or incorrect locational information (province) were not included.
2. Enterprises must have complete financial data along the dimensions of revenue, profits, social security contribution, value added and wages.
3. For all of the variables mentioned in point 2, outliers were removed, defined as observations that fall below the first percentile or above the 99th percentile for each variable.
4. Enterprises must have complete information across all years on current and lagged values for social security, revenue, profits, enterprise size, legal status, female share, average wage and revenue growth.



## Appendix B

**Table 1 Enterprise categorization, by different criteria**

	(1) Asset (million rupiah)	(2) Gross income (million rupiah)	(3) No. of employees (BPS)	(4) No. of employees (World Bank)
Micro enterprise	maximum 50	maximum 300 million	1–4	1–10
Small enterprise	> 50–500	>300–2 500	5–19	11–50
Medium enterprise	> 500–10 000	> 2.5–50 000	20–99	51–300
Large enterprise	> 10 000	> 50 000	>99	>300

Note: MSME categories according to Law No. 20 (2008), Statistics Indonesia (BPS) and the World Bank. Financial figures are annual amounts in million rupiah.

**Table 2 Social security contribution rates over time**

Schemes	Astek (from 1977)	Jamsostek (from 1992)	BPJS Employment (from 2014)
Work injury	Employer: 0.24–3.6% Worker: -	Employer: 0.24–1.74% Worker: -	Employer: 0.24–1.74% Worker: -
Death benefit	Employer: 0.5% Worker: -	Employer: 0.3% Worker: -	Employer: 0.3% Worker: -
Old-age savings	Employer: 1.5% Worker: 1%	Employer: 3.7% Worker: 2%	Employer: 3.7% Worker: 2%
Health insurance*		Employer: 3% (single worker) or 6% (with family) Worker: -	Employer: 4% Worker: 1%
Pension scheme**			Employer: 2% Worker: 1%

Note: \*=From 2014, it was called Social Health Insurance (under BPJS Health). \*\*=Only took effect 1 July 2015. Astek: Asuransi Tenaga Kerja, or social insurance for workers; Jamsostek: Jaminan Sosial Tenaga Kerja, or worker's social security system; BPJS: Penyelenggara Jaminan Sosial, or Social Security Administrator for Health.  
Source: Author's calculations.

**Table 3 Summary statistics**

	2011		2012		2013		2014		All	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Social security, nominal	1 300	2 426	1 932	4 332	1 839	4 608	2 189	5 056	1 890	4 439
Social security, real	1 210	2 257	1 733	3 885	1 572	3 938	1 780	4 110	1 617	3 763
Revenue, nominal	672 632	4 284 207	754 476	2 697 545	702 920	2 363 489	899 702	8 074 127	778 190	5 410 402
Revenue, real	625 704	3 985 309	676 660	2 419 323	600 787	2 020 076	731 465	6 564 331	667 195	4 506 857
Revenue growth	26 097	1 626 872	10 204	3 843 200	998	1 545 519	131 388	6 399 933	53 461	4 322 498
Profits, nominal	215 587	953 210	265 473	1 123 884	270 154	1 153 066	385 670	4 762 840	300 729	2 969 310
Profits, real	200 546	886 707	238 092	1 007 968	230 901	985 526	313 553	3 872 228	256 468	2 433 311
Enterprise size	339	805	367	998	332	934	288	722	325	858
<b>Size categories (% shares):</b>										
Small	0.31	0.46	0.27	0.44	0.31	0.46	0.29	0.45	0.29	0.46
Medium	0.44	0.50	0.46	0.50	0.45	0.50	0.50	0.50	0.47	0.50
Large	0.25	0.43	0.27	0.44	0.24	0.43	0.21	0.41	0.24	0.43
<b>Legal status (% shares):</b>										
Central government owned	0.04	0.20	0.04	0.21	0.03	0.18	0.03	0.16	0.03	0.18
Local government owned	0.01	0.09	0.01	0.10	0.01	0.07	0.00	0.07	0.01	0.08
Privately owned	0.79	0.40	0.76	0.42	0.81	0.39	0.83	0.38	0.80	0.40
Foreign invested	0.16	0.37	0.19	0.39	0.16	0.36	0.15	0.36	0.16	0.37
<b>Sectors (% shares):</b>										
Low value added	0.41	0.49	0.40	0.49	0.45	0.50	0.44	0.50	0.43	0.49
Medium value added	0.40	0.49	0.41	0.49	0.38	0.49	0.37	0.48	0.39	0.49
High value added	0.19	0.39	0.19	0.39	0.17	0.38	0.19	0.39	0.18	0.39
Urban location	0.00	0.00	0.00	0.00	0.00	0.00	0.75	0.43	0.27	0.44
Female % share	0.34	0.28	0.33	0.28	0.35	0.28	0.36	0.27	0.35	0.28
Average wages, nominal	21 225	7 350	21 639	7 682	21 055	7 518	24 347	11 208	22 373	9 125
Average wages, real	19 364	6 784	19 739	7 121	19 179	6 980	19 794	9 112	19 545	7 803
Observations	2966		3583		4564		6103		17216	

Note: SD = Standard deviation. Financial variables are in IDR1,000; real financial variables were deflated with the national GDP deflator (base year 2010). 1 USD = 14,318.39 IDR (as off 13-08-19).

**Table 4 Social security determinants, unbalanced panel estimates**

	(1)
Enterprise size	0.233*** (0.020)
Local government owned	-0.152 (0.269)
Privately owned	0.215* (0.113)
Foreign invested	0.315** (0.124)
Sector – medium value added	0.048 (0.054)
Sector – high value added	0.017 (0.068)
Location – urban	0.462*** (0.083)
Female % share (lagged)	-0.206** (0.089)
Average wages (lagged)	0.780*** (0.082)
Revenue growth (lagged)	0.385*** (0.026)
r <sup>2</sup>	-
N	17 216

Note: Logit estimates. Year dummy included in all specifications. Standard errors (in parentheses) are clustered at the enterprise level. \*= $p < 0.10$ , \*\*= $p < 0.05$ , \*\*\*= $p < 0.01$ .  
Source: Author's elaboration, based on Indonesia Manufacturing Survey data.

**Table 5 Revenue and social insurance estimates, unbalanced panel, OLS**

	(1)	(2)
Social security (lagged)	0.169*** (0.008)	0.125*** (0.007)
Firm size	0.097*** (0.011)	0.075*** (0.011)
Local government owned	-0.685*** (0.202)	-0.651*** (0.196)
Privately owned	0.063 (0.096)	0.244*** (0.084)
Foreign invested	0.482*** (0.100)	0.650*** (0.088)
Female % share (lagged)		-1.577*** (0.053)
Average wages (lagged)		0.892*** (0.055)
Revenue growth (lagged)		0.538*** (0.008)
Location controls	Yes	Yes
Sector controls	Yes	Yes
r <sup>2</sup>	0.25	0.46
N	17 216	17 216

Note: Year dummy included in all specifications. Standard errors (in parentheses) are clustered at the enterprise level. \*= $p < 0.10$ , \*\*= $p < 0.05$ , \*\*\*= $p < 0.01$ .  
Source: Author's elaboration based on Indonesia Manufacturing Survey data.

**Table 6 Revenue and social insurance, balanced panel estimates**

	(1) OLS	(2) OLS	(3) Fixed effect, balance
Social security (lagged)	0.184*** (0.015)	0.143*** (0.014)	0.039*** (0.008)
Firm size	0.041** (0.020)	0.051*** (0.019)	-0.140*** (0.045)
Local government owned	-0.756* (0.386)	-0.661 (0.405)	-0.027 (0.124)
Privately owned	0.088 (0.140)	0.271** (0.128)	0.065 (0.118)
Foreign invested	0.557*** (0.145)	0.676*** (0.134)	0.268** (0.130)
Female % share (lagged)		-1.556*** (0.103)	-0.133 (0.166)
Average wages (lagged)		1.076*** (0.105)	0.488*** (0.101)
Revenue growth (lagged)		0.519*** (0.011)	0.513*** (0.008)
Location controls	Yes	Yes	No
Sector controls	Yes	Yes	Yes
r <sup>2</sup>	0.23	0.43	0.52
Number of groups			1 523
Observations	6 092	6 092	6 092

Note: Year dummy included in all specifications. Standard errors (in parentheses) are clustered at the enterprise level.

\*=p<0.10, \*\*=p<0.05, \*\*\*=p<0.01.

Source: Author's elaboration based on Indonesia Manufacturing Survey data.

**Table A1 Profits and social insurance, balanced panel estimates**

	(1) OLS	(2) OLS	(3) FE, balanced
Social security (lagged)	-0.021*** (0.008)	-0.012 (0.007)	0.001 (0.007)
Firm size	0.029*** (0.011)	0.028*** (0.011)	0.021 (0.024)
Local government owned	0.209 (0.230)	0.175 (0.232)	0.393 (0.368)
Privately owned	-0.241*** (0.066)	-0.288*** (0.066)	0.066 (0.102)
Foreign invested	-0.255*** (0.068)	-0.268*** (0.068)	0.170 (0.119)
Female % share (lagged)		0.161*** (0.061)	0.106 (0.173)
Average wages (lagged)		-0.166*** (0.049)	0.001 (0.062)
Profit growth (lagged)		0.471*** (0.017)	0.501*** (0.012)
Location controls	Yes	Yes	No
Sector controls	Yes	Yes	Yes
r <sup>2</sup>	0.08	0.32	0.56
Number of groups			1 518
Observations	6 072	6 072	6 072

Note: Year dummy included in all specifications. Compared with table 4, 20 observations are dropped due to missing profit data. Standard errors (in parentheses) are clustered at the enterprise level. \*=p<0.10, \*\*=p<0.05, \*\*\*=p<0.01.

Source: Author's elaboration based on Indonesia Manufacturing Survey data.

**Table A2 Revenue and social insurance estimates, by enterprise size categories, balanced panel and fixed effect**

	(1) Small	(2) Medium	(3) Large
Social security (lagged)	0.041** (0.018)	0.030*** (0.011)	0.036** (0.015)
Firm size	-0.022 (0.080)	-0.276*** (0.058)	-0.142** (0.064)
Local government owned	2.127*** (0.810)	0.000 (.)	0.230*** (0.077)
Privately owned	1.706** (0.790)	-0.084 (0.112)	0.031 (0.137)
Foreign invested	2.790*** (0.876)	-0.061 (0.142)	0.209 (0.172)
Female % share (lagged)	-0.246 (0.309)	0.136 (0.302)	-0.156 (0.219)
Average wages (lagged)	0.704** (0.330)	0.254** (0.121)	0.234* (0.138)
Revenue growth (lagged)	0.494*** (0.015)	0.517*** (0.012)	0.495*** (0.016)
Location controls	No	No	No
Sector controls	Yes	Yes	Yes
r2	0.60	0.51	0.50
Number of groups	393	810	511
Observations	1 376	2 894	1 822

Note: Year dummy included in all specifications. Due to changes in enterprise size over time, the panel is not equally balanced by enterprise size category (only the overall panel is). Standard errors (in parentheses) are clustered at the enterprise level. \*= $p < 0.10$ , \*\*= $p < 0.05$ , \*\*\*= $p < 0.01$ .

Source: Author's elaboration based on Indonesia Manufacturing Survey data.

**Table A3 Profits and social insurance estimates, by enterprise size categories, balanced panel and fixed effect**

	(1) Small	(2) Medium	(3) Large
Social security (lagged)	0.013 (0.013)	0.007 (0.009)	-0.013 (0.013)
Firm size	0.116* (0.066)	0.024 (0.042)	0.005 (0.032)
Local government owned	-0.047 (0.283)	0.000 (.)	0.584* (0.335)
Privately owned	0.274 (0.275)	-0.041 (0.227)	0.100 (0.117)
Foreign invested	0.661 (0.453)	0.058 (0.250)	0.138 (0.129)
Female % share (lagged)	0.073 (0.279)	0.007 (0.198)	0.267 (0.320)
Average wages (lagged)	-0.175* (0.104)	-0.030 (0.096)	0.052 (0.096)
Profit growth (lagged)	0.479*** (0.020)	0.490*** (0.019)	0.514*** (0.023)
Location controls	No	No	No
Sector controls	Yes	Yes	Yes
r2	0.59	0.54	0.57
Number of groups	392	809	508
Observations	1 372	2 890	1 810

Note: Year dummy included in all specifications. Due to changes in enterprise size over time, the panel is not equally balanced by enterprise size category (only the overall panel is). Standard errors (in parentheses) are clustered at the enterprise level. \*= $p < 0.10$ , \*\*= $p < 0.05$ , \*\*\*= $p < 0.01$ .

Source: Author's elaboration based on Indonesia Manufacturing Survey data.

**Table A4 Revenue and social insurance estimates, by legal status, OLS and fixed effect**

Panel A, OLS	(1) CG	(2) LG	(3) DP	(4) FO
Social security (lagged)	0.023 (0.026)	0.218** (0.100)	0.115*** (0.008)	0.108*** (0.015)
Firm size	-0.283*** (0.076)	0.408** (0.175)	0.108*** (0.011)	0.053** (0.023)
Female % share (lagged)	-2.986*** (0.407)	-0.112 (0.882)	-1.279*** (0.058)	-1.026*** (0.116)
Average wages (lagged)	0.557*** (0.199)	0.909* (0.534)	0.841*** (0.062)	0.691*** (0.140)
Revenue growth (lagged)	0.574*** (0.054)	0.485*** (0.108)	0.540*** (0.008)	0.502*** (0.020)
Location controls	Yes	Yes	Yes	Yes
Sector controls	Yes	Yes	Yes	Yes
r2	0.70	0.71	0.49	0.57
Number of groups				
Observations	592	109	13 823	2 804

Note: Year dummy included in all specifications. Standard errors (in parentheses) are clustered at the enterprise level. CG= central Government owned; LG=local government; DP=domestic private; FO=foreign owned. \*= $p < 0.10$ , \*\*= $p < 0.05$ , \*\*\*= $p < 0.01$ .

Source: Author's elaboration based on Indonesia Manufacturing Survey data.

Panel B, fixed effect	(1) CG	(2) LG	(3) DP	(4) FO
Social security (lagged)	0.045 (0.031)	0.090* (0.042)	0.035*** (0.010)	0.057*** (0.017)
Firm size	-0.455*** (0.125)	0.248 (0.319)	-0.127*** (0.049)	-0.103 (0.071)
Female % share (lagged)	0.170 (0.287)	4.244 (5.445)	-0.088 (0.177)	-0.380 (0.387)
Average wages (lagged)	-0.189 (0.190)	0.741 (0.600)	0.360*** (0.114)	0.610*** (0.144)
Revenue growth (lagged)	0.505*** (0.046)	0.487*** (0.102)	0.511*** (0.009)	0.513*** (0.021)
Location controls	No	No	No	No
Sector controls	Yes	Yes	Yes	Yes
r2	0.50	0.84	0.54	0.49
Number of groups	80	10	1237	333
Observations	240	35	4686	1188

Note: Year dummy included in all specifications. Due to some enterprises changing legal status over time, the panel is not equally balanced by legal category (only the overall panel is). Standard errors (in parentheses) are clustered at the enterprise level. CG= central Government owned; LG=local government; DP=domestic private; FO=foreign owned. \*= $p < 0.10$ , \*\*= $p < 0.05$ , \*\*\*= $p < 0.01$ .

Source: Author's elaboration based on Indonesia Manufacturing Survey data.

**Table A5 Profits and social insurance estimates, by legal status**

	(1) CG	(2) CG	(3) DP	(4) FO	(5) DP	(6) FO
	OLS	OLS	OLS	OLS	Fixed effect	Fixed effect
Social security (lagged)	0.016 (0.016)	-0.053 (0.062)	-0.008* (0.005)	-0.022*** (0.008)	-0.004 (0.009)	0.002 (0.009)
Firm size	0.088** (0.042)	-0.180 (0.145)	0.032*** (0.007)	0.013 (0.015)	0.052* (0.027)	-0.155*** (0.039)
Female % share (lagged)	-0.098 (0.234)	-0.814 (0.550)	0.181*** (0.033)	0.156* (0.083)	0.203 (0.214)	0.177 (0.174)
Average wages (lagged)	0.040 (0.126)	-0.142 (0.350)	-0.074*** (0.026)	-0.149** (0.067)	-0.011 (0.079)	-0.048 (0.120)
Revenue growth (lagged)	0.475*** (0.041)	0.546*** (0.057)	0.524*** (0.015)	0.472*** (0.022)	0.520*** (0.014)	0.421*** (0.026)
Location controls	Yes	Yes	Yes	Yes	No	No
Sector controls	Yes	Yes	Yes	Yes	Yes	Yes
r2	0.50	0.67	0.36	0.37	0.58	0.53
Number of groups					1 233	333
Observations	589	107	13 802	2 802	4 670	1 188

Note: Year dummy included in all specifications. Due to changes in legal status over time, the panel is not equally balanced by legal category (only the overall panel is). Standard errors (in parentheses) are clustered at the enterprise level. CG= central Government owned; LG=local government; DP=domestic private; FO=foreign owned. \*= $p < 0.10$ , \*\*= $p < 0.05$ , \*\*\*= $p < 0.01$ .

Source: Author's elaboration based on Indonesia Manufacturing Survey data

**Table A6 Revenue and social insurance estimates, by different industries, OLS**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Food and beverages	Textiles	Apparel	Chemical products	Rubber	Electronic machinery	Furniture
Social security (lagged)	0.085*** (0.014)	0.135*** (0.022)	0.066*** (0.019)	0.170*** (0.030)	0.046* (0.026)	0.123*** (0.026)	0.093*** (0.020)
Firm size	0.027 (0.026)	0.157*** (0.031)	0.038 (0.024)	0.075 (0.048)	-0.005 (0.038)	0.225*** (0.034)	0.040* (0.022)
Female % share (lagged)	-1.869*** (0.112)	-0.754*** (0.165)	-0.056 (0.156)	-2.014*** (0.234)	-0.772*** (0.168)	-0.829*** (0.164)	-0.734*** (0.122)
Average wages (lagged)	0.964*** (0.130)	0.390* (0.208)	0.351 (0.330)	0.808*** (0.150)	1.270*** (0.156)	0.487** (0.197)	0.688*** (0.114)
Revenue growth (lagged)	0.543*** (0.017)	0.586*** (0.027)	0.465*** (0.030)	0.529*** (0.027)	0.497*** (0.032)	0.515*** (0.031)	0.547*** (0.040)
r2	0.53	0.53	0.30	0.44	0.46	0.41	0.46
Observations	4 396	1 084	1 035	1 301	1 659	1 067	1 391

Note: Year dummy included in all specifications. OLS. Standard errors (in parentheses) are clustered at the enterprise level. \*= $p < 0.10$ , \*\*= $p < 0.05$ , \*\*\*= $p < 0.01$ .  
Source: Author's elaboration based on Indonesia Manufacturing Survey data



**Table A7 Profits and social insurance estimates, by different industries, OLS**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Food and beverages	Textiles	Apparel	Chemical products	Rubber	Electronic machinery	Furniture
Social security (lagged)	0.000 (0.006)	-0.039* (0.023)	-0.016 (0.018)	0.030** (0.012)	-0.002 (0.013)	-0.047** (0.021)	-0.013 (0.017)
Firm size	0.035*** (0.009)	-0.011 (0.023)	0.061** (0.025)	0.005 (0.020)	0.086*** (0.023)	-0.048** (0.024)	0.015 (0.022)
Female % share (lagged)	-0.050 (0.050)	0.165 (0.146)	0.161 (0.138)	0.233** (0.094)	-0.223** (0.105)	0.186 (0.148)	0.522*** (0.130)
Average wages (lagged)	0.094** (0.041)	0.051 (0.129)	-0.414 (0.300)	-0.063 (0.065)	-0.489*** (0.099)	0.148 (0.131)	-0.252** (0.115)
Revenue growth (lagged)	-0.005 (0.013)	-0.016 (0.044)	-0.126*** (0.039)	0.000 (0.021)	-0.081*** (0.022)	-0.059* (0.031)	0.057 (0.038)
r2	0.04	0.06	0.05	0.07	0.13	0.07	0.12
Observations	4 387	1 084	1 032	1 301	1 659	1 066	1 388

Note: Year dummy included in all specifications. OLS. Standard errors (in parentheses) are clustered at the enterprise level. \*= $p < 0.10$ , \*\*= $p < 0.05$ , \*\*\*= $p < 0.01$ .  
Source: Author's elaboration based on Indonesia Manufacturing Survey data