# Standards compliance, participation in the global value chain and the value-added of labour: evidence from Vietnam's small-and-medium-sized enterprises

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## Abstract

**Purpose** – The authors investigate the impact of standards compliance on the participation in the global value chain and labour value-added of Vietnam's small and medium-sized enterprises (SMEs).

**Design/methodology/approach** – The authors use a three-period panel dataset of SMEs combined with Vietnam's Provincial Competitiveness Index. The authors also use multiple econometric models; and with each model, the authors include all independent variables that are available from the study's data and that are suggested by the literature.

**Findings** – The authors find that standards compliance by Vietnam's SMEs improved their participation in the global value chain via subcontracts with FDI multinational firms. The authors also find that standards compliance improved the value-added of labour in Vietnam's SMEs, which is robust to the choice of econometric models.

**Practical implications** – The study's results suggest that better outcomes for firms and society will be possible if standards are recognised and respected.

**Originality/value** – This paper complements scant literature on the impact of standards compliance on global value chain participation via subcontracting work and labour value-added, especially in developing countries.

**Keywords** Compliance, Global value chain, Productivity, SME, Standards, Vietnam

**Paper type** Research paper

> Despite the well-known incentives to free ride, a social optimum may be within reach provided that agents have a precise idea of what actions would be prescribed by ethics, and they feel bad if their own actions do not match the moral ideal
>
> Van Long (2019)

## 1. Introduction

Globalisation has changed the world economy. Globalisation has boosted international trade and investment (Beveridge & Addo, 2017; Yanase & Long, 2021), shifting many value chains from one country to another (Beugelsdijka, Pedersen, & Petersen, 2009). Globalisation has

provided grounds for many new internationally recognised economic and production rules and standards (Husted, Montiel, & Christmann, 2016; Wrana & Revilla Diez, 2018). Overall, globalisation has promoted economic prosperity in developed and developing countries (Harrison, 1996; Wacziarg & Welch, 2008; Villaverde & Maza, 2011).

International standards play essential roles in globalisation. These internationally recognised rules address asymmetric information problems and are considered facilitators of global market access, especially for developing countries (Trifkovic, 2017). International standards provide incentives for firms to improve their competitiveness in management and operational practice (Goedhuys & Sleuwaegen, 2013) with cost reductions (Bayati & Taghavi, 2007), improved productivity (Delmas & Pekovic, 2013; Orzes, Jia, Sartor, & Nassimbeni, 2017) and more competitive advantages (Henson & Caswell, 1999; Porter, 1990). Also, international standards promote the global supply chain by allowing a broader range of producers to contribute to the same products, where multinational enterprises can outsource many activities and only retain the core roles (Long, 2005).

Firms in developing countries may have significant benefits from globalisation. Apart from better access to international markets (Zhang *et al.*, 2020), they can participate in the global value chains of multinational companies by supplying parts, components, materials and services to MNEs via subcontracting work (UNIDO, 2019). More importantly, local firms can improve their technology, knowledge and management capacities by learning from FDI firms in the same sector (Meyer & Sinani, 2009). Local firms can also employ higher-quality staff trained by FDI firms (Meyer & Sinani, 2009). However, a necessary condition to realise these benefits and opportunities is that firms in developing countries must recognise internationally accepted rules and standards while facing higher competition from foreign-invested firms and imported commodities (Long, Raff, & Stähler, 2009).

This paper empirically tests the hypothesis proposed by Prof Ngo Van Long (2019) in relation to Vietnam's small-and-medium enterprises (SMEs). In particular, we investigate whether enterprises that comply with international standards (or at least have certificates of compliance) could achieve improved business outcomes (and also more favourable outcomes for society) in terms of participation in the global value chain and the value-added by labour. Compliance with international standards encompasses areas such as environmental protection, working conditions and stakeholder engagement (Husted *et al.*, 2016) are regarded as ethical and responsible practices for SMEs.

Our research question is attempted via econometric analysis with 3-period panel data. In response to critics of publication bias (Franco, Malhotra, & Simonovits, 2014; Brodeur, Lé, Sangnier, & Zylberberg, 2016), i.e. the true model or specification is unknown and reported results are biased towards publishable properties (Leamer, 1978), we use multiple econometric models; and with each model, we include all independent variables that are available from our data and that are suggested by the literature.

The remainder of the paper is organised as follows. Section 2 provides a brief overview of our case study, including some related literature. In section 3, we describe the data and the methodology for the empirical analysis. Section 4 presents the results, followed by discussions in section 5 and a conclusion in section 6.

## 2. Overview of the case study
SMEs play an essential role in Vietnam's economy. SMEs account for around 97% of Vietnam's total enterprises (see Table 1). Vietnam's SMEs have contributed 45% of GDP, 31% of total state budget revenue and 60% of jobs created (MPI, 2019). However, almost all SMEs are non-state enterprises, and they have more challenges than state-own enterprises, including access to the finance market, government support and global supply chain participation (MPI, 2019).

| | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 |
|---|---|---|---|---|---|---|---|---|---|---|
| Total enterprises in Vietnam | 279,360 | 324,691 | 346,777 | 373,213 | 402,326 | 442,485 | 505,059 | 654,633 | 714,755 | 758,610 |
| The proportion of SMEs in total enterprises | 97.5% | 97.6% | 95.9% | 97.6% | 97.9% | 98.0% | 97.6% | 98.1% | 97.2% | 96.7% |

**Source(s):** Vietnam's Statistic Year Books (2014, 2017, and 2020), White Book of Vietnam's SMEs, 2014, and White book on Vietnamese Businesses (2019, 2020)

Improving productivity is critical for Vietnam's SMEs in the context of globalisation. This is because productivity is the key determinant of competitiveness (Long *et al.*, 2009), and labour productivity in Vietnam is lower than in many other countries (APO, 2019). Apart from macro-level conditions (e.g. institutions and macroeconomic policies), a key reason for the low productivity is the lack of efficient production technology and management expertise at the firm level. A plausible approach for SMEs to improve their productivity is to join the global value chain via subcontracting works with FDI (multinational) enterprises, which benefits them via knowledge and technology transfer (Giroud & Scott-Kennel, 2009; Pietrobelli & Rabellotti, 2011). However, the proportion of local Vietnamese SMEs subcontracting to FDI firms is low, at around 1%.

While compliance with international standards is crucial for SMEs seeking to enter the global supply chain, the number of Vietnamese SMEs that adhere to these standards remains low. For instance, the average number of ISO certificates per 1,000 enterprises in Vietnam was 5 in 2010. It increased to 14 in 2016 but declined to 8 in 2019 (GSO, 2013; GSO, 2017; GSO, 2020; ISO, 2021). This paper aims to address the research question of whether international standards compliance can provide benefits to Vietnam's SMEs in terms of their participation in the global value chain and the enhancement of labour value-added. By exploring this question, we intend to shed light on the underlying factors contributing to the persistently low numbers. Specifically, we seek to determine whether the absence of benefits from standards compliance for Vietnam's SMEs could be a significant factor behind these discouraging figures. It is crucial to acknowledge that even if the results indicate potential benefits of standards compliance for SME participation, this finding does not discount the challenges in meeting international standards for Vietnam's SMEs.

There are a number of previous studies about standards compliance in Vietnam's SMEs. For example, Nguyen and Tran (2021) find a positive impact of standards compliance on tax compliance of Vietnam's SMEs. Trifkovic (2017) finds that international standards compliance improved working conditions in Vietnam's SMEs (e.g. formal labour contracts and more training for workers) but had no significant impacts on fringe benefits (e.g. paid sick leave, health, social, unemployment and accident insurance). Nguyen and Hens (2015) and Ni, Tamechika, Otsuki, and Honda (2018) conclude that complying with environmental management standards improved firms' ecological awareness, attention and operational performance. However, Wrana and Revilla Diez (2018) do not find any significant impacts of standards compliance on total factor productivity growth in Vietnam, possibly because international standards compliance may only generate superior performance only if firms can simultaneously upgrade their technology. In this paper, we employ multiple econometric models with more updated datasets to provide a complementary analysis of the impact of standards compliance on subcontracting with multinational firms and labour value-added.

## 3. Methods and materials

### 3.1 Data and data sources

We combine two datasets to undertake our analysis. The first dataset is the key one which includes data from SME surveys collaboratively conducted by the Central Institute for Economic Management in Vietnam, the Institute of Labour Science and Social Affairs in Vietnam and the University of Copenhagen. These surveys covered ten of Vietnam's provinces (or cities), namely Hanoi, Ha Tay, Hai Phong, Phu Tho, Nghe An, Quang Nam, Khanh Hoa, Lam Dong, Long An and Ho Chi Minh City. There are, in total, six surveys, each covering 2,500 Vietnamese non-state SMEs, conducted in 2005, 2007, 2009, 2011, 2013 and 2015. This paper uses data from the three surveys conducted in 2011, 2013 and 2015 because the information on international standards compliance was unavailable in pre-2011 surveys.

The second dataset is the Provincial Competitiveness Index (PCI), calculated by the Vietnamese Chamber of Commerce and Industry (VCCI). VCCI conducts annual surveys to collect information about Vietnamese enterprises' perception of their provincial institution quality. This dataset has been used as a reliable reference to evaluate the efforts of the provincial governments in the business environment and administrative reform.

We combined the two data sources to get a three-year unbalanced data set. We removed incomplete observations to avoid attrition or other missing data problems (Murtazashvili & Wooldridge, 2016). After this cleaning step, we obtained a panel dataset with 5712 observations.

### 3.2 Variables for econometric analysis

*3.2.1 Dependent variables and the key explanatory variable.* We investigate the possible impacts of standards compliance on two dependent variables. The first variable is whether firm $i$ has become a subcontractor for an FDI multinational firm at time $t$ ($Subcontractor_{it}$). This is a binary variable, taking the value of one if a firm is a subcontractor of an FDI firm and zero otherwise. The second dependent variable is the average labour value-added measured by the labour's value-added per employee in the logarithm form ($Labour\_value\_added_{it}$).

The key explanatory variable is whether a firm has an international standards certificate, which certifies that the firm complies with a recognised international standard. This is a binary variable, taking the value of one if the firm has an international standards certificate and zero otherwise. We do not distinguish specific standards because our datasets do not contain information on specific international standards that a firm is certified.

*3.2.2 The control exogenous variables.* Our analysis uses a number of control exogenous variables that may impact the dependent variables, which are available from the datasets. These variables are summarised in Table 2. This table also briefly provides reasons for including these variables in our analysis, together with relevant sources.

We also add year dummies and sector dummies to control the year-specific effects and sector-specific effects.

*3.2.3 The instrumental variable.* Our analysis uses one instrument variable (IV) for standards compliance when required by econometric models. The IV is whether, in the same sector and district, there is at least one rival firm with an international standards certificate. We refer to this IV as "certified rival firm" for short. This IV is a proper instrument for two reasons. First, it can affect the likelihood of standards compliance. Complying with international standards can be considered as moving from a non-complying regime to a complying one. According to Long, Prieur, Tidball, and Puzon (2017), adopting a new regime will affect the other player's equilibrium switching strategy, a firm's decision to comply with international standards can be influenced by its rival's standards compliance (Trifkovic, 2017). Second, whether a rival firm has an international standard certificate can be reasonably assumed to be beyond the control of the focal firm. In this case, this IV does not correlate with the focal firm's unobservable firm characteristics. As a result, this IV does not directly impact the focal firm's likelihood to be a subcontractor of FDI firms and labour value-added but indirectly via the focal firm's standards compliance. The basic statistics of all variables we use in our analysis are summarised in Table 3.

### 3.3 Econometrical specifications

To generate reliable answers to our research questions, we use multiple econometric models for each dependent variable. In each model, we include all the exogenous control variables and the IV (if necessary) justified by the literature, as in Table 2. Below is a description of the econometric models.

*3.3.1 Econometrical models for the impact of standards compliance on being sub-contracted by FDI firms.* We estimate the impact of standards compliance on being sub-contracted by FDI firms using six econometric models. The first model is the endogenous switching model

| Variables | Description | Brief reasons for inclusion | As suggested by |
|---|---|---|---|
| Firm age | Durations between established and surveyed years | The older firms are, the higher their experience accessing the market | Hong, Zhou, and Wang (2020), Jensen, Mcguckin, and Stiroh (2001), Bahk and Gort (1993), Reddy, Chundakkadan and Sasidharan (2020) |
| Firm size | (The log of) total employees | Larger enterprises may benefit from economies of scale | Hong *et al.* (2020), Reddy *et al.* (2020), Co, Nguyen, Nguyen, and Tran (2018), Crespi and Zuniga (2012) |
| Single owner | Binary: 1 ≡ one-owner; 0 ≡ multi-owners | These are proxies for the legal status (ownership types) that may impact performance | Chuong *et al.* (2020), Damiani, Pompei and Ricci (2018), Vukšić (2016), Reddy *et al.* (2020) |
| Formal firm | Binary: 1 ≡ formal firm; 0 ≡ household firm | | |
| Capital | (The log of) firm's annual physical asset value (million VND) | Capital may have impacts on productivity | Casler and Rose (1998) |
| Bribe | (The log of) the annual amount a firm must pay for a bribe (million VND) | These are proxies for institution and business environment quality that may impact performance | Zhou (2014), Eckhardt and Poletti (2018), Ganau and Rodríguez-Pose (2019), Ganau and Rodríguez-Pose (2019), Rizov (2008) |
| PCI | Provincial Competitive Index (point) | | |

**Source(s):** Tables by authors

**Table 2.**
Summary of control exogenous variables

| Variables | min | Max | Mean | Sd |
|---|---|---|---|---|
| Subcontractor (Yes = 1) | 0 | 1 | 0.01 | 0.11 |
| Labour value-added (Million VND in log) | 0 | 15.07 | 11.06 | 0.86 |
| Standards compliance (Yes = 1) | 0 | 1 | 0.08 | 0.27 |
| Firm age (year) | 2 | 76 | 14.11 | 9.32 |
| Firm size (employee in log) | 0 | 7.44 | 2.26 | 1.06 |
| Single owner (Yes = 1) | 0 | 1 | 0.79 | 0.41 |
| Formal firm (Yes = 1) | 0 | 1 | 0.45 | 0.50 |
| Capital (million VND in log) | 2.49 | 13.57 | 7.54 | 1.56 |
| Bribe (million VND in log) | 0 | 13.82 | 2.20 | 3.11 |
| PCI (point) | 52.38 | 62.74 | 58.05 | 3.26 |
| Certified rival firm (Yes = 1) | 0 | 1 | 0.501 | 0.5 |

**Source(s):** Tables by authors

**Table 3.**
Summary of variables

(ESM) for panel data proposed by Murtazashvili and Wooldridge (2016). This model was extended from the cross-section ESM of Heckman (1976) to address the endogenous and self-selection problem. The panel-data ESM has two stages. The first stage is to run the random effect probit of the standards compliance (SC) in equation (1) where $Z_{it}$ contains all exogenous control variables $z_{it}$ and the IV, $\overline{Z}_i$ are the time average of $Z_{it}$ ($\overline{Z}_i = T^{-1} \sum_{t=1}^{T} Z_{it}$), $\sigma$ is the intercept, $k_t$ is year dummies, $w_{it}$ are error terms and $\Phi(.)$ is the CDF of standard normal distribution.

$$Probability(SC_{it} = 1|Z_{it}) = \Phi(\sigma + k_t + Z_{it}\pi + \overline{Z}_i\delta + w_{it}) \tag{1}$$

The second stage in panel-data ESM is to run a pooled OLS in equation (2) where $\widehat{h}_{it}$ is the generalised residuals of equation (1) to correct possible endogeneity biases. We provide the

formula for the generalised residuals in Appendix 1. In this stage, the standard errors must be adjusted by a bootstrap procedure because $\widehat{h}_{it}$, an estimated value, is added to the equation. We can also use the cluster-robust Wald statistic to test the jointly significant of $\widehat{h}_{it}$ and interactions between $SC_{it}$ and $\widehat{h}_{it}$ on the null hypothesis of non-endogeneity of standards compliance.

$$Subcontractor_{it} = \theta + \delta SC_{it} + \beta_k z_{it} + \overline{Z}_i \rho_0 + \mu_0 \widehat{h}_{it} + \mu_1 SC_{it} \widehat{h}_{it} + k_t + \varepsilon_{it} \tag{2}$$

The second econometric model we use that controls for possible endogeneity is the two-stage least squares fixed-effect model (FE-IV). FE-IV estimation also has two stages. In the first stage, we run a "basic" fixed-effect model of standards compliance in equation (3) where $c_i$ is fixed-effect unobserved characteristics of firms. In the second stage, we run another basic fixed-effect model of the dependent variable, $Subcontractor_{it}$, as specified in equation (4) where the key explanatory variable (standards compliance) is replaced by its fitted value $\widehat{SC}$ from equation (3). The standard errors of the second stage also have to be adjusted by a bootstrap procedure.

$$SC_{it} = Z_{it}\pi + k_t + c_i + w_{it} \tag{3}$$

$$Subcontractor_{it} = \delta\widehat{SC}_{it} + \beta_k z_{it} + c_i + k_t + \varepsilon_{it} \tag{4}$$

The third model we use to control for possible endogeneity is the two-stage least squares random effect model (RE-IV). The estimation of RE-IV is similar to FE-IV, i.e. two-step estimation. The only difference is that random-effect estimation, instead of fixed-effect estimation, is used in both steps.

The three remaining econometric models we use to analyse the impact of standards compliance on being sub-contracted are probit, logit and random-effect probit. Unlike the ESM, FE-IV and RE-IV, the last three models do not control for possible endogeneity biases, and these may provide more efficient estimates if endogeneity issues are not present. These models are described in equations (5)-(7) below where $u_{it}$ is the random-effect error term.

$$Prob\left(Subcontractor_{it} = 1|z_{it}\right) = \Phi(\beta_0 + \beta_1 SC_{it} + \beta_2 z_{it} + k_t) \tag{5}$$

$$Log\left(\frac{Prob\left(Subcontractor_{it} = 1|z_{it}\right)}{1 - Prob\left(Subcontractor_{it} = 1|z_{it}\right)}\right) = \beta_0 + \beta_1 SC_{it} + \beta_2 z_{it} + k_t \tag{6}$$

$$Prob\left(Subcontractor_{it} = 1|z_{it}\right) = \Phi(\beta_0 + \beta_1 SC_{it} + \beta_2 z_{it+} k_t + u_{it}) \tag{7}$$

*3.3.2 Econometrical models for the impact of standards compliance on labour value-added.* We also estimate the impact of standards compliance on labour value-added using six econometric models. The three first models we control for possible endogeneity biases include ESM, FE-IV and RE-IV models. The specifications of those three models are similar to the ESM, FE-IV and RE-IV models for being sub-contracted by FDI firms in section 3.3.1. The only difference is that the dependent variable is labour value-added in each model instead of subcontractor.

The three remaining econometric models we use to analyse the impact of standards compliance on labour value-added are the pooled OLS, the random effect and the fixed effect models. Unlike the ESM, FE-IV and RE-IV, the last three models do not control for possible endogeneity biases. However, they may provide more efficient estimates if endogeneity issues are not present. These models are described in equations (8)-(10) below where $u_{it}$ is the random-effect error term and $c_i$ is fixed-effect unobserved characteristics of firms.

$$Labour\_value\_added_{it} = \beta_0 + \beta_1 SC_{it} + \beta_2 z_{it} + k_t + \varepsilon_{it} \tag{8}$$

$$Labour\_value\_added_{it} = \beta_0 + \beta_1 SC_{it} + \beta_2 z_{it} + k_t + u_{it} + \varepsilon_{it} \qquad (9)$$

$$Labour\_value\_added_{it} = \beta_1 SC_{it} + \beta_2 z_{it} + c_i + k_t + \varepsilon_{it} \qquad (10)$$

## 4. Results
Table 4 summarises econometrical estimates of the impact of standards compliance on Vietnam's SMEs being subcontracted by FDI firms. The first three columns report the results from three econometric models that control for the possible endogeneity of the key explanatory variable, i.e. standards compliance. The only model that returns a negative impact is the random-effect-with-instrument estimator (RE-IV), and the estimated coefficient of the key explanatory variable is not statistically significant. Given that the RE-IV is less

| | Endogenous switching model (1) | FE-IV model (2) | RE-IV model (3) | Probit model (4) | Logit model (5) | Random-effect probit model (6) |
|---|---|---|---|---|---|---|
| Standards compliance | 0.053*** | 0.059 | −0.099 | 0.451*** | 1.015*** | 0.566*** |
| | (0.0191) | (0.044) | (0.065) | (0.146) | (0.329) | (0.209) |
| Firm age | 0.0003 | 0.0002 | 0.0001 | 0.001 | 0.002 | 0.003 |
| | (0.0004) | (0.0004) | (0.0002) | (0.007) | (0.016) | (0.009) |
| Firm size | 0.004 | 0.003 | 0.020*** | 0.263*** | 0.599*** | 0.376*** |
| | (0.0046) | (0.005) | (0.006) | (0.066) | (0.154) | (0.095) |
| Single owner | 0.006 | 0.006 | −0.008 | 0.028 | 0.005 | 0.111 |
| | (0.0108) | (0.009) | (0.007) | (0.131) | (0.307) | (0.182) |
| Formal firm | 0.019 | 0.017 | 0.005 | 0.101 | 0.350 | 0.153 |
| | (0.0169) | (0.018) | (0.005) | (0.149) | (0.386) | (0.204) |
| Capital (log) | 0.0003 | −0.00002 | 0.001 | −0.022 | −0.063 | −0.066 |
| | (0.0023) | (0.003) | (0.002) | (0.047) | (0.115) | (0.063) |
| Bribe (log) | −0.00001 | 0.0001 | −0.0003 | 0.0004 | 0.007 | −0.0001 |
| | (0.0008) | (0.001) | (0.001) | (0.021) | (0.052) | (0.027) |
| PCI | −0.00001 | −0.0004 | 0.001* | 0.053*** | 0.115** | 0.064** |
| | (0.0011) | (0.001) | (0.001) | (0.019) | (0.047) | (0.028) |
| Generalised residual | 0.007 | | | | | |
| | (0.0108) | | | | | |
| Standards compliance: Generalised residual | −0.024* | | | | | |
| | (0.0133) | | | | | |
| Sigma | | | | | | 0.975*** |
| | | | | | | (0.215) |
| Constant | −0.119*** | | −0.107*** | −6.697*** | −14.261*** | −7.696*** |
| | (0.0362) | | (0.036) | (1.190) | (2.891) | (1.815) |
| Year dummies | Yes | Yes | Yes | Yes | Yes | Yes |
| Sector dummies | Yes | Yes | Yes | Yes | Yes | No |
| P-values of endogeneity tests | 0.144 | 0.34 | | | | |
| Observations | 5712 | 5712 | 5712 | 5712 | 5712 | 5712 |

**Note(s):** ●Significance code: $^*p < 0.1$; $^{**}p < 0.05$; $^{***}p < 0.01$
●The F statistics in the first stage of FE-IV and RE-IV are 405.5 and 51.1, solid statistical evidence for the IV's strength
●The random effect probit does not converge when we add sector dummies; therefore, in this model, we do not add sector dummies into its equation
●The first stage of the models with IV is reported in Appendix 2
**Source(s):** Tables by authors

**Table 4.**
The impact of standards compliance on being subcontractors of FDI firms

robust than the FE-IV estimator in relation to consistency, the RE-IV is not the most reliable estimator in this case. Thus, the two robust models, i.e. ESM and FE-IV, consistently imply that standards compliance increased the likelihood of being subcontractors – though with different levels of statistical significance.

We conduct some hypothesis tests on the endogeneity of standards compliance where the null hypothesis is non-endogeneity. The Wald test associated with the ESM returns a p-value of 0.144, i.e. we cannot reject the null hypothesis at 10%. In addition, the Wu-Hausman test associated with the FE-IV model returns a p-value of 0.34, which is not strong evidence for endogeneity either. As controlling for possible endogeneity when not necessary may reduce the efficiency of an estimator, i.e. making it appear less statistically significant than it is, we undertake a robustness check with some models that do not control for endogeneity.

The results of three models that do not control for possible endogeneity are reported in the last three columns of Table 4 (probit, logit and random-effect probit). The estimated coefficients of standards compliance in all three columns are positively significant at 1%, implying that standards compliance positively impacts the likelihood of a firm being a subcontractor of FDI firms. This is consistent with the two most reliable estimators that control for endogeneity (ESM and FE-IV), though with different significance levels. In other words, our results suggest evidence that standards compliance helps increase the likelihood of firms becoming subcontractors for FDI firms, and this result is relatively robust to model choice.

Four of six models demonstrate that two control variables, including firm size and PCI, are positively significant at different significance levels. This suggests that firm size and the quality of institutions may positively impact the likelihood of SMEs becoming subcontractors for FDI firms. However, the remaining control variables are insignificant at the 10% level, indicating that they do not significantly influence the likelihood of SMEs becoming subcontractors for FDI firms.

Table 5 summarises econometrical estimates of the impact of standards compliance on labour value-added. Similar to the arrangement in Table 4, the first three columns of Table 5 report the results of three models that control for the possible endogeneity of standards compliance. All three estimated coefficients in these columns are positive but not statistically significant, at least at 10%.

Using the model in the first three columns, we conduct some tests where the null hypothesis is standards compliance is not endogenous in relation to labour value-added. The Wald test associated with the ESM returns a p-value of 0.898. The Wu-Hauman tests associated with the FE-IV and RE-IV models are 0.21 and 0.96, respectively. These test statistics imply that whether endogeneity exists is unclear, and if it does not, controlling for endogeneity may reduce the efficiency of the estimators.

We use a set of economic models which do not control for endogeneity, namely pooled OLS, the random-effect and the fixed-effect methods. The estimated coefficients of standards compliance in all three models are positively significant at 1%. These estimates imply that standards compliance can improve labour value-added, consistent with the ESM, FE-IV and RE-IV estimators, but with more statistical significance.

Amongst the control variables, different models yield inconsistent results regarding the impact of firm age on labour value added. While ESM, FE-IV and fixed-effect models indicate no effect, RE-IV, OLS and random effect models suggest a negative and significant relationship. However, the later models are considered less reliable compared to FE-IV and fixed-effect models. Consequently, it is possible that firm age has no impact on labour value added.

Regarding other variables, six models demonstrate a significant negative effect of firm size on labour value-added, while formal firm and capital exhibit positive and significant effects at the 1% significance level. This implies that firm size negatively affects labour value-added, whereas capital has a positive impact. Additionally, formal firms tend to have higher labour value-added than household firms.

| | Endogenous switching model (1) | FE-IV model (2) | RE-IV model (3) | Pooled OLS model (4) | Random-effect model (5) | Fixed-effect model (6) |
|---|---|---|---|---|---|---|
| Standards compliance | 0.135 | 0.530 | 0.157 | 0.179*** | 0.192*** | 0.227*** |
| | (0.1) | (0.346) | (0.491) | (0.054) | (0.051) | (0.085) |
| Firm age | 0.0001 | −0.003 | −0.003** | −0.004** | −0.004*** | −0.003 |
| | (0.003) | (0.004) | (0.001) | (0.001) | (0.001) | (0.004) |
| Firm size | −0.203*** | −0.211*** | −0.130*** | −0.132*** | −0.134*** | −0.203*** |
| | (0.063) | (0.061) | (0.044) | (0.022) | (0.023) | (0.064) |
| Single owner | −0.050 | −0.030 | −0.056 | −0.055 | −0.060 | −0.045 |
| | (0.077) | (0.075) | (0.054) | (0.041) | (0.042) | (0.073) |
| Formal firm | 0.143** | 0.146*** | 0.211*** | 0.211*** | 0.217*** | 0.148*** |
| | (0.069) | (0.056) | (0.039) | (0.039) | (0.038) | (0.054) |
| Capital (log) | 0.130*** | 0.130*** | 0.142*** | 0.142*** | 0.144*** | 0.135*** |
| | (0.019) | (0.022) | (0.014) | (0.011) | (0.012) | (0.021) |
| Bribe (log) | 0.013* | 0.012* | 0.017*** | 0.017*** | 0.014** | 0.010 |
| | (0.007) | (0.007) | (0.006) | (0.006) | (0.005) | (0.007) |
| PCI | −0.001 | −0.014** | 0.031*** | 0.031*** | 0.027*** | −0.014** |
| | (0.008) | (0.007) | (0.004) | (0.004) | (0.004) | (0.007) |
| Generalised residual | 0.017 | | | | | |
| | (0.101) | | | | | |
| Standards compliance: Generalised residual | 0.007 | | | | | |
| | (0.108) | | | | | |
| Constant | 7.978*** | | 8.297*** | 8.297*** | 8.532*** | |
| | (0.237) | | (0.243) | (0.242) | (0.235) | |
| Year dummies | Yes | Yes | Yes | Yes | Yes | Yes |
| Sector dummies | Yes | Yes | Yes | Yes | Yes | Yes |
| P-values of endogeneity tests | 0.898 | 0.21 | 0.96 | | | |
| Observations | 5712 | 5712 | 5712 | 5712 | 5712 | 5712 |

**Note(s):** • Significance code: $^{*}p < 0.1$; $^{**}p < 0.05$; $^{***}p < 0.01$
• The F statistics in the first stage of FE-IV and RE-IV are 405.5 and 51.1, solid statistical evidence for the IV's strength
• The p-values returned by specification tests fixed-effect versus the pooled OLS, and the random-effect are smaller than 0.001, indicating that the fixed-effect model is more robust than pooled OLS and the random effect
• The first stage of the models with IV is reported in Appendix 2
**Source(s):** Tables by authors

**Table 5.**
The impact of having internationally recognised standard certificates on the labour value-added

In addition, five of six models indicate a positive and significant relationship between bribes and labour value-added, suggesting that bribes have a positive impact. On the other hand, the effect of the PCI variable is inconsistent across models. ESM shows no significant effect, while FE-IV and fixed-effect models indicate a negative significance at the 5% level. In contrast, RE-IV, OLS and random effect models demonstrate a positive significance at the 1% level. However, due to the lower reliability of the later models, it is possible that PCI negatively affects labour value-added.

## 5. Discussions and policy implications
Our results show that standards compliance in Vietnam can improve the likelihood of firm participation in the global value chain. This finding is consistent with the studies of Biong (2013) and Kaplinsky (2010), who find that adopting international standards can increase the chance of subcontracting work for FDI firms. We also find that firms with international

standards certificates in Vietnam may have higher labour value-added than their peers, similar to the results of Calza, Goedhuys, and Trifković (2019), who find that adopting international standards can improve productivity.

There are two possible reasons why standards compliance in Vietnam can improve the likelihood of firm participation in the global value chain via subcontracting work. First, complying with international standards (or having an international standards certificate) helps Vietnamese SMEs signal to FDI firms that they are reliable suppliers and partners. Firms' information asymmetry in developing countries, including Vietnam, is much higher than in developed countries (Huynh, Wub, & Duong, 2020). Therefore, FDI firms are more challenging to choose local suppliers or subcontractors in a developing country such as Vietnam. According to Long (1976), firms can have better decisions with better-quality information. Therefore, having a standards certificate can signal FDI firms to choose their potential suppliers and partners (Kirmani & Rao, 2000). As a result, standards compliance helps increase Vietnamese SMEs' likelihood of becoming subcontractors of FDI firms.

Second, having internationally recognised standards certificates may improve local firms' competitiveness. To have certificates, local Vietnamese firms must meet a set of standards regulated in the certificates. To do so, they have to analyse, evaluate, adjust and modify their production and distribution processes for goods and services, resulting in cost reductions and efficiency improvement (Goedhuys & Sleuwaegen, 2013). As a result, firms' competitiveness increases, enhancing the chance of being chosen as subcontractors by FDI firms.

In addition, there are two reasons why standards compliance can help improve labour value-added in Vietnam. First, standards compliance helps improve human capital, which is one of the key factors influencing labour productivity (Arvanitis & Loukis, 2009). Certified firms in Vietnam pay higher wages and provide more employee training opportunities (Trifkovic, 2017). Hence, the quality of employees or human capital in firms with international standards certificates is better than their non-certified peers. Second, standards compliance helps improve innovation capacity. When complying with standards, firms improve their knowledge and adjust their production, promoting their innovation capacity (Sirivariskul, 2019). As a result, their labour value-added improves because innovation capacity is an essential factor that positively impacts firms' labour productivity (Pham & Ho, 2017).

Our finding has an important policy implication, i.e. standards compliance should be promoted as a policy priority towards economic prosperity. Firms can benefit from complying with international standards. Standards compliance is important because it can improve the performance of SMEs in the ongoing globalisation era. This is especially important for economic development when SMEs are key job creators in Vietnam's economy. The current proportion of Vietnam SMEs that comply with international standards remains low as mentioned in section 2. To address this gap, it is crucial to provide financial and technical assistance to support these firms in overcoming the potential high up-front costs associated with adopting international standards. Such support is vital for enhancing the competitiveness and growth potential of SMEs, thereby contributing to overall economic advancement.

It is, however, important to highlight that our findings are not always similar to some previous studies. For example, Liukko, Vuori, and Woodside (1997) concluded that having international standard certificates (standards compliance) was not highly valued by lead firms in choosing their subcontractors. In addition, Ma, Zhang, and Yin (2020) find negative impacts of environmental management standards compliance on labour value-added.

There are possible reasons for the diversity of literature, including our estimates. First, our case study is in Vietnam - a developing country, while Liukko et al. (1997) concentrated on Finland, a country with a higher level of economic development and business environment quality. As the benefits of standards compliance might be more significant in weak-institutional contexts (Goedhuys & Sleuwaegen, 2013), it might be less significant in developed countries where the business environment is considered of higher quality (Peres,

Ameer, & Xu, 2018; Sabir, Rafique, & Abbas, 2019). Second, the impact of standards compliance on firm performance also depends on commitment from firms' personnel and management regarding standards compliance (Feng, Terziovski, & Samson, 2007). In addition, the impact of standards compliance may vary across specific standards, e.g. environmental and product-quality standards may have different impacts on business activities and labour value-added as analysed from an economic perspective (Ma *et al.*, 2020).

In addition to examining the impact of standard compliance, it is also worth discussing the effects of certain control variables. Most of the significant variables show expected signs of impact, consistent with the current literature. However, two variables that serve as proxies for institutions exhibit unexpected signs of the impact of institutions on labour value-added. Specifically, a higher level of bribe payments is found to increase labour value added. This unexpected result could be attributed to firms paying informal fees to expedite processes that are advantageous to them. These informal payments may contribute to increased profits, which is part of value-added, leading to an increase in labour value-added.

On the other hand, improvements in provincial institutions have a negative impact on labour value-added. The possible reason for this finding is that improvements in institutions mean enhancing institutional transparency and reducing corruption, limiting the opportunity for local firms to utilise bribes to facilitate their activities. Consequently, these enterprises' profits are negatively affected, resulting in a decrease in value-added and therefore reducing labour value added. The unexpected findings in relation to bribe payments and institutional quality highlight the complexities of the relationship between institutions, corruption and labour value-added. It is crucial to continue exploring these dynamics and adopt a comprehensive approach that balances transparency, institutional quality and sustainable business practices to foster long-term growth and participation in the global value chain of Vietnamese firms.

We acknowledge some caveats. The datasets we use do not include information on specific standards a firm has been certified for (if any). Consequently, we are not able to investigate how impacts vary across specific standards. Also, given the 3-period panel dataset, it is not possible for us to investigate the long-term impacts of standards compliance on firm performance. We are not able to collect reliable information about the cost of standards compliance which would be able to allow a complementary analysis, and it could be a useful direction for future research.

## 6. Conclusions

In this paper, we investigated the impact of standards compliance on the participation in the global value chain and labour value-added of Vietnam's SMEs. Our results confirm that standards compliance can improve firm performance, which suggests that good social outcomes will be achieved if firms operate in accordance with commonly accepted rules. We contend that this is also the belief of one of the greatest Vietnam-ancestry economists, Professor Ngo Van Long, who has devoted much of his precious time to the relationship between recognised norms and economic prosperity.

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## Appendixes
### Appendix 1.
**The formula for the generalised residuals (first stage of the endogenous switching model)**
In the first stage of the endogenous switching, we run the random effect probit of the standards compliance (SC) in equation (A1) where $Z_{it}$ contains all exogenous control variables $z_{it}$ and instrument variables for standards compliance, $\overline{Z}_i$ are the time average of $Z_{it}$ ($\overline{Z}_i = T^{-1} \sum_{t=1}^{T} Z_{it}$), $\sigma$ is the intercept, $k_t$ is time intercept (coefficient of year dummies), $w_{it}$ are error terms, and $\Phi(.)$ is the CDF of standard normal distribution.

$$Probability(SC_{it} = 1|Z_{it}) = \Phi\left(\sigma + k_t + Z_{it}\pi + \overline{Z}_i\delta + w_{it}\right) \tag{A1}$$

From the estimation results of equation (A1), we get the $\widehat{\sigma}$, $\widehat{k}_t$, $\widehat{\pi}$ and $\widehat{\delta}$ and we can calculate the generalised residuals as follows:

$$\widehat{h}_{it} = D_{it}\lambda\left(\widehat{\sigma} + \widehat{k}_t + Z_{it}\widehat{\pi} + \overline{Z}_i\widehat{\delta}\right) - (1 - D_{it})\lambda\left(\left(-\widehat{\sigma} - \widehat{k}_t - Z_{it}\widehat{\pi} - \overline{Z}_i\widehat{\delta}\right)\right) \tag{A2}$$

$\lambda(.)$ is the inverse Mill ratio function which is a ratio of the probability density function (PDF) to the complementary cumulative distribution function (CDF).

### Appendix 2.
**The first stage of the endogenous switching model and two-stage least squares fixed effect (FE-IV) models**

| | The endogenous switching model (1) | FE-IV model (2) | RE-IV model (3) |
|---|---|---|---|
| Certified rival firm (IV) | −2.316*** | −0.260*** | 0.016* |
| | (0.258) | (0.033) | (0.009) |
| Firm age | 0.028 | 0.001 | 0.001* |
| | (0.027) | (0.001) | (0.0004) |
| Firm size | 0.240* | 0.022* | 0.066*** |
| | (0.127) | (0.011) | (0.006) |
| Single owner | −0.206 | −0.040* | −0.068*** |
| | (0.167) | (0.023) | (0.014) |
| Formal firm | 0.169 | 0.023 | 0.035*** |
| | (0.415) | (0.023) | (0.010) |
| Capital (log) | 0.143* | 0.009 | 0.019*** |
| | (0.075) | (0.006) | (0.003) |
| Bribe (log) | −0.046** | −0.007*** | −0.004*** |
| | (0.023) | (0.002) | (0.001) |
| PCI | 0.081** | −0.001 | −0.003** |
| | (0.039) | (0.002) | (0.001) |
| Sigma | 1.086*** | | |
| | (0.116) | | |
| Constant | −4.405*** | | −0.003 |
| | (1.289) | | (0.083) |
| Year dummies | | | |
| Sector dummies | | | |
| F statistics | | 405.5 | 51.1 |
| Observations | 5712 | 5712 | 5712 |

**Table A1.**
The determinants of standards compliance (the first stage)

**Note(s):** •Significance code: *$p < 0.1$; **$p < 0.05$; ***$p < 0.01$
•The Hausman test between the fixed effect model and the random effect model of the first stage returns a $p$-value smaller than 0.001; thus, we use the fixed effect estimator for the first stage
**Source(s):** Tables by authors