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## Article

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# A comparative analysis of Zambian and newly industrialised country manufacturing finance models

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## ABSTRACT

This study compares the Zambian and NICs manufacturing finance models to identify their similarities and differences with a view to enhance Zambia's manufacturing finance and consequently manufacturing development. It applies structural equation modelling on a merged dataset and contrasts four dimensions of manufacturing finance namely, access to working capital finance, access to investment finance, domestic private start-up investment and foreign private start-up investment. The study finds similarities and differences between NICs and Zambia, and across NICs, showing variations in variable effects across contexts owing to varying political and economic conditions. The study argues that effective policy learning requires analyses of the functional level variations in the learning and exemplar countries.

## IMPACT STATEMENT

The study contrasts four manufacturing finance models across the study countries, making three main contributions to literature. Firstly, while extant literature presents statistical and qualitative comparisons between NICs and developing countries for policy learning, comparison of the functional models is rarely addressed, this study attempts to fill this gap. Secondly, while finance literature focuses on generic access to finance by operating firms, this study simultaneously analyses four disaggregations of access to finance, namely, working capital finance, investment finance, domestic private start-up investment and foreign private start-up investment. These distinctions help understand the respective characteristics and interrelationships among firm creation investment, and working capital and investment finance for operating firms. Lastly, the study pioneers a detailed modelling of Zambia's manufacturing finance, a topic and context for which literature is limited.

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## 1. Introduction

While developing countries have numerous industrialised countries to learn from, effective implementation of manufacturing finance remains a challenge (Chansa et al., 2019; El-Haddad, 2010; Lee, 2019; Mendes et al., 2014; Mudenda, 2009; Rodrik, 2009; Romana & Leonardo, 2014; Weiss, 2005). This is evident in the sub-optimal outcomes despite widespread policy learning and adoption. Many sub-Saharan African countries in the post-independence era for instance yield less than desired results from the adoption of the import substitution industrialisation strategy from Latin America (Mendes et al., 2014). Zambia is no exception – having applied four different manufacturing finance and development strategies with lukewarm results (Chansa et al., 2019; Mudenda, 2009). Coarse country comparison and policy adoption appear to be recurring themes in developing countries (Mendes et al., 2014). Sometimes good policies are adopted from incompatible countries, other times, subtle nuances in seemingly compatible countries stifle outcomes. In either case, the results are not optimal. Manufacturing finance policy learning thus requires a methodical comparison of the causal relationships in learning and exemplar countries.

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This study compares the Zambian and Newly Industrialised Countries (NICs) manufacturing finance models to identify their functional similarities and differences to accentuate functional level policy learning with a view to enhance Zambia's manufacturing finance and consequently manufacturing development. It contrasts four manufacturing finance models across the study countries, making three main contributions to the literature. Firstly, while extant literature presents statistical and qualitative comparisons between NICs and developing countries for policy learning (Chansa et al., 2019; El-Haddad, 2010; Lee, 2019; Prasad & Nickow, 2016; Romana & Leonardo, 2014), comparison of the functional models is rarely addressed. Secondly, while finance literature focuses on generic access to finance (Fowowe, 2017; Mertzanis, 2017; Musamali & Tarus, 2013; Sibanda et al., 2013; Wasiuzzaman et al., 2019) by operating firms, this study simultaneously analyses four disaggregations of access to finance, namely, working capital finance, investment finance, domestic private start-up investment, and foreign private start-up investment. Working capital and investment finance for operating firms serve different purposes; with firms facing varying degrees of access difficulty between the two, policy needs to approach them separately to be effective (Kádárová et al., 2015). In the same way, start-up investment and access to finance for existing firms need to be delineated. Because firm ownership largely speaks to the investment conditions that prevailed at the firm establishment, this type of investment should not be unconditionally linked to prevailing firm characteristics and macroeconomic conditions. This distinction aids the understanding of firm creation investment among domestic and foreign actors, their determinants, and the appropriate policy tools needed to promote them. Lastly, the study pioneers a detailed modelling of Zambia's manufacturing finance, a topic, and context for which literature is limited.

## 2. Literature review

With manufacturing established as an engine for growth (Szirmai et al., 2013), and manufacturing finance being a critical input that still evades developing countries, manufacturing finance policy learning appears to be a critical step to manufacturing development. Further, NICs provide developing countries such as Zambia the best learning specimen compared to initial industrialisers such as Britain. This is because NICs industrialised over a relatively shorter period and achieved this more recently. It is no wonder policy makers and academia look to NICs for manufacturing development lessons (Chansa et al., 2019; El-Haddad, 2010; Fischer, 2018; Lee, 2019; Prasad & Nickow, 2016; Romana & Leonardo, 2014). Six NICs are used in this analysis namely, India, Indonesia, Malaysia, Philippines, South Africa, and South Korea, with South Korea receiving special attention as proposed by Lindauer and Pritchett (2002). These NICs were selected based on their similarity and policy compatibility with Zambia across 12 themes, namely, economic growth and manufacturing development, financial, political and legal systems, banking and non-banking sector structures, foreign investment inflows, foreign aid receipts, fiscal policy, household financial sector participation and manufacturing firm properties.

Zambia has undertaken four industrial development strategies since independence, namely, colonial transition (1964 – 1967), import substitution industrialisation (1968 – 1991) and market liberalisation (1992 – 2000) and export-oriented industrialisation (2001 – present), with the latter three adopted from external sources (Chansa et al., 2019; Mudenda, 2009; Seidman, 1974; Simson, 1985; Thurlow & Wobst, 2006). Associated with these strategies were evidently ineffective manufacturing finance sub-strategies which relied on mining revenues in the import substitution strategy (Carmody, 2009; Chansa et al., 2019; Gui-Diby & Renard, 2015; Liebenthal & Cheelo, 2018; Seidman, 1974), foreign and domestic private investment reinforced with aid and mining revenue in the liberalisation phase (Carmody, 2009) and foreign investment, aid and mining revenue in the export orientation strategy (BoZ et al., 2019; Bwalya, 2006; GRZ, 2014, 2018). Cumulatively, inadequate manufacturing finance has been backstopping manufacturing development challenges due to such factors as commodity price shocks, inconsistency and incoherency and poor alignment to the national development strategy (BoZ et al., 2019; Chansa et al., 2019; GRZ, 2014, 2018; Mudenda, 2009; Thurlow & Wobst, 2006).

Literature drawing manufacturing finance and development policy lessons from NICs such as Chansa et al. (2019), El-Haddad (2010), Lee (2019) Prasad and Nickow (2016), Romana and Leonardo (2014), Weiss (2005) and Yusuf (2014) while useful tend to superficially assess the compatibilities between NICs and developing countries. This shortcoming thus implies that sound NICs policies may be misapplied in

developing countries. Such work nonetheless provides necessary qualitative and statistical insight into NIC policy application in developing countries. Lee (2019) for instance in drawing manufacturing finance lessons from South Korea for application in African countries while noting that South Korean conditions in the 1950s were similar to those of African countries notes the importance of centrally managed manufacturing finance. With a Zambia focus, Chansa et al. (2019) highlights some qualitative manufacturing sector differences between South Korea and Zambia but proceed to note potential intersections for policy learning.

Manufacturing finance is unique among the forms of development finance and consequently carries unique demand and supply considerations that need to be harmonised in analysis. On the demand side, Mertzanis (2017) uses a 136 country micro-survey dataset to explore the effects of firm characteristics on firm access to finance and finds that ownership type has significant effects on the financial constraints faced. Further, Musamali and Tarus (2013) find that larger, older, incorporated and manufacturing sector (see also Wu et al., 2008a vis-à-vis asset structure) firms have more access to finance among Kenyan SMEs. In the same vein, Ayodeji and Balcioglu (2010) find that ownership structure, education level of entrepreneurs (in contrast to Amornkitvikai and Harvie (2018)), sub-sector type, external start-up financing sources, credible market information sources and trade organisation membership had positive effects on the success of financing industrial sector SMEs in Nigeria. Rasiah (2011) conversely finds inverse relationships between access to finance and firm size as well as labour productivity in 151 Malaysian industrial firms. Amornkitvikai and Harvie (2018) also attest to the significance of smaller firm size, further pointing to collateral and financial transparency as well (see also Beck and Feyen (2013)).

On the supply side, Hoxha (2013) explores banking structure and manufacturing performance and finds that while higher bank concentration and capital market development (see also Allen and Santomero (1997) for a case for new markets) promote higher manufacturing for sub sectors that require external finance, bank competition is harmful to these sub sectors. Sethi (2018) examines a similar phenomenon in India and finds that banking sector reliant manufacturing firms grow faster with financial development (see also Gui-Diby and Renard, 2015 for the significance of financial development to the industrialisation of NICs), however contradicting Hoxha (2013) in exposing a negative relationship between bank concentration and manufacturing firm growth, adding that bank risk aversions inhibit manufacturing sector growth. In this regard, the Zambian financial sector development policy notes that the Zambian financial sector is bank dominated with high bank concentration (GRZ, 2017). Further, Toby and Peterside (2014) found that manufacturing benefited more from commercial and merchant bank financing relative to agriculture, concluding however that bank financing towards manufacturing and agriculture for overall economic growth remained significantly limited in Nigeria. Mesagan et al. (2018) supports this conclusion in finding no significant relationship between manufacturing and financial development in Nigeria, noting that while the country has experienced financial development, its ability to support the manufacturing sector has remained weak. Fanta (2012) found similar results, noting that Ethiopian banking reform did not resolve manufacturing SME access to finance. The counteracting findings notwithstanding, the supply of manufacturing finance needs to be harnessed across different sources including the banking and non-banking sectors.

Merging the two sides, the supply and demand of manufacturing finance need to be aligned for successful manufacturing development. Alignment of the supply and demand requires address of the multiplicity of nuances on both sides, jointly and individually. This thus requires harmonising both micro level data from firms on the demand side and macro-level data from regulatory institutions and financiers on the supply side (Beck & Feyen, 2013). Summarily, firm characteristics affect access to finance and aligning the supplied financial products to these characteristics enhances their utilisation.

### 3. Methodology

Structural Equation Modelling (SEM) may be seen as a multivariate estimation technique that considers both observed and unobserved variables (Igolkina & Meshcheryakov, 2020; Rosseel, 2012). Its origins can be traced back to Wright (1921), in path analysis involving only observed variables that later evolved to encompass the economics inspired simultaneous equation models and factor analysis from psychology

(Ilgolkina & Meshcheryakov, 2020; Rosseel, 2012). SEM has consequently evolved to comprise a diverse set of tools and approaches including, path analysis, factor analysis and multivariate regression models.

Three SEM features make it especially suited for the study. Firstly, SEM's estimation of several regressions at the same time in which an independent variable in one equation may be a dependent variable in another makes it especially useful for this study (Kline, 2015; Rosseel, 2012). Secondly, SEM allows the modelling of complex relationships simultaneously, given that this study models numerous relationships across several subjects (countries), SEM halves the number of analyses conducted (Hox & Bechger, 1999; Kline, 2015; Ockey, 2013). Thirdly, SEM's inclusion of unobserved variables allows robustness checks of the unobserved components of the study conceptual framework with minimal deviation from the primary analytical model (Ilgolkina & Meshcheryakov, 2020; Kline, 2015). Explicit path analysis in SEM additionally made it an attractive option as it allowed greater flexibility in conducting robustness checks through path manipulation.

Notwithstanding the strategic draws, SEM carries four assumptions that need to be considered before application, namely, no multicollinearity and singularity, linear relationships between the variables, multivariate normality, and observation independence, with a minimum sample size of 150 recommended (Kline, 2015; Ockey, 2013). As such, four pre-estimation tests were conducted, following standard SEM literature (Chang et al., 2009; Hox & Bechger, 1999; Kline, 2015; Ockey, 2013; Rosseel, 2012). Specifically, multicollinearity and singularity were initially assessed using correlation analysis with Variance Inflation Factor being checked on correlation results greater than 0.9. linearity was assessed on bivariate scatter plots while multivariate composed two tiers. Firstly, univariate normality was assessed based on the skewness and kurtosis absolute values, with results higher than 3 in the former and 10 in the latter being considered problematic. Secondly, multivariate normality was tested using Mardia's coefficient of multivariate kurtosis, adopting Satorra-Bentler correction and bootstrapped standard errors in cases of non-normal data (Hox & Bechger, 1999; Kline, 2015; Ockey, 2013; Rosseel, 2012).

SEM analysis also requires post estimation checks to ensure that the resulting model is well fitted. In this regard, four checks are proposed in literature, chi-square statistic, an absolute fit index, a relative fit index, and the standard root mean square residual (Chang et al., 2009; Hox & Bechger, 1999; Ilgolkina & Meshcheryakov, 2020; Kline, 2015; Ockey, 2013; Rosseel, 2012). The chi-square statistic assesses the deviation between the population covariance matrix estimated based on the model and the sample covariance matrix based on the data. The model is well fitted if the deviation is not significant. In the study formulation, obtaining a p-value higher than 0.05 implies that the model is well fitted. Because the chi-square statistic is based on sample size however, mild differences in between the proposed model and actual data in large data sets can lead to an erroneous conclusion about the model fit. As such, absolute and relative fit indices, operationalised through the Root Mean Square Error of Approximation (RMSEA) and Comparative Fit Index (CFI), respectively and the SRMR provide fit assessments that consider sample size and other factors. Literature recommends up to 0.08 for RMSEA, 0.9 and above for the CFI and less than 0.1 for SRMR (Kline, 2015; Ockey, 2013). With the multiplicity of considerations, overall analysis of model fit considers all post estimation checks wholistically.

Specifically, the study used Generalised SEM to model the NICs and Zambian manufacturing finance models. The access to working capital finance (AWC) and access to investment finance (AIN) models for the respective efficient NIC firms and Zambian firms carried the following functional forms:

$$\begin{aligned} AWC_i &= \beta_0 - \beta_1 X_{1i} + \beta_1 X_{2i} + \beta_1 X_{3i} + \dots + \beta_n X_{ni} + \varepsilon_i \\ AIN_i &= \alpha_0 - \alpha_1 Y_{1i} + \alpha_2 Y_{2i} + \alpha_3 Y_{3i} + \dots + \alpha_m Y_{mi} + \tau_i \end{aligned}$$

Where  $\mathbf{X}$  and  $\mathbf{Y}$  are independent variable vectors in AWC and AIN models, with varying configurations between efficient NICs and Zambia. Further,  $\beta$  and  $\alpha$  are vectors of coefficients and intercepts with  $i$  representing the firm ID and,  $\varepsilon$  and  $\tau$  are the respective error terms. While the domestic private start-up investment (DPO) and foreign private start-up investment (FPO) models for the respective study countries carried the following functional forms:

$$\begin{aligned} DPO_j &= \pi_0 - \pi_1 V_{1j} + \pi_2 V_{2j} + \pi_3 V_{3j} + \dots + \pi_l V_{lj} + \psi_j \\ FPO_j &= \lambda_0 - \lambda_1 W_{1j} + \lambda_2 W_{2j} + \lambda_3 W_{3j} + \dots + \lambda_o W_{oj} + \varphi_j \end{aligned}$$

Where  $\mathbf{V}$  and  $\mathbf{W}$  are independent variable vectors in the DPO and FPO models, with varying configurations across the respective study countries. Further,  $\pi$  and  $\lambda$  are vectors of coefficients and intercepts with  $j$



representing the firm ID and,  $\psi$  and  $\varphi$  are the respective error terms. It should be emphasized that the start-up investment models attempted to investigate the conditions that prevailed at firm establishment, returning only firms that were at most 10 years old and using proxy variables where necessary. Specifically, after establishing the firm start-up years, the prevailing economic conditions in those respective years were retrieved and applied in the analysis. The study used the *lavaan* package in R to estimate the structural equation models. Robustness checks took three forms, path manipulation, iteration with substitute indicators and alternative non-normality estimation techniques. The study combined three data sources namely; World Bank Enterprise Surveys, World Development Indicators and Zambia Statistics Agency population data, and applied OECD technology intensity definitions (OECD, 2011) across the seven study countries. The study analysed 10,536 manufacturing firms surveyed between 2005 – 2020; 7,129 from India (2014), 1,066 from Indonesia (2015), 585 from Malaysia (2014), 1,028 from Philippines (2015), 337 from South Africa (2020), 213 from South Korea (2005) and 179 from Zambia (2019). Data from Ministries of Finance and National Statistical Offices was used to supplement the main datasets in cases of missing data. See the [Appendix table](#) for detailed variable definitions and type, and data sources.

## 4. Results

This section presents the respective NICs and Zambian access to finance and start-up investment model results. As stated above, manufacturing finance was for analytical accuracy and policy development precision divided into two components: access to working capital and investment finance and domestic and foreign private start-up investment. In the former case, two respective SEM results are presented for efficient NIC firms and Zambian firms while the latter presents six respective SEM results for individual newly industrialised countries and Zambia. While the former analysed the access to finance of operating firms, the latter attempted to analyse the conditions that prevailed at the firm establishment. In each SEM result, two tables were analysed, the model fit and regression tables, and a path diagram. Because all the model fits satisfied the SEM model fit assessment criteria presented in the methodology section above, space is conserved by only presenting the regression tables, the model fit tables and path diagrams are nonetheless available on request. In the same way, the need for leaner exposition led to the omission of the pre-estimation test results and strategic robustness checks, these analyses are nonetheless available on request.

### 4.1. Access to working capital and investment finance

#### 4.1.1. Efficient NIC firms working capital and investment finance

Efficient NIC firms working capital and investment finance are shown in [Table 1](#).

**Table 1.** SEM regressions: efficient NICs working capital and investment finance (WCIF).

Access to working capital finance	Estimate	Standard error	Z-Value	p-Value
Intercept	5.232	1.081	4.842	0.000
Firm type	−2.410	0.324	−7.447	0.000
Court constraints	−1.086	0.619	−1.755	0.079
Number of workers	0.569	0.155	3.664	0.000
Taxation constraints	0.727	0.394	1.844	0.065
Capacity utilisation	−0.018	0.007	−2.814	0.005
Annual sales	−0.252	0.080	−3.174	0.002
Foreign technology	0.709	0.373	1.901	0.057
Access to investment finance	Estimate	Standard error	Z-Value	p-Value
Intercept	−2.943	0.558	−5.274	0.000
Court constraints	0.658	0.282	2.335	0.020
Number of workers	0.233	0.084	2.774	0.006
Capacity utilisation	−0.011	0.003	−3.218	0.001
Fixed assets	6.784	0.273	24.847	0.000
Foreign ownership	−0.013	0.005	−2.441	0.015
Annual sales	−0.107	0.043	−2.496	0.013
External auditing	−0.359	0.136	−2.642	0.008
Government ownership	−0.031	0.018	−1.724	0.085
Manager's experience	0.017	0.010	1.715	0.086

#### 4.1.2. *Zambian firms working capital and investment finance*

Zambian firms working capital and investment finance are shown in Table 2.

**Table 2.** SEM regressions: Zambian firms WCIF.

Access to working capital finance	Estimate	Standard Error	Z-Value	p-Value
Intercept	13.574	2.531	5.363	0.000
Firm type	14.556	5.223	2.787	0.005
Taxation constraints	12.338	4.767	2.588	0.010
Number of workers	−0.018	0.015	−1.263	0.207
Annual sales	0.012	0.007	1.657	0.097
Access to investment finance	Estimate	Standard error	Z-Value	p-Value
Intercept	5.171	4.599	1.124	0.261
Fixed assets	18.825	3.526	5.340	0.000
Capacity utilisation	−0.126	0.059	−2.127	0.033
City population	5.736	3.923	1.462	0.144

## 4.2. *Start-up investment*

This section presents the respective start-up investment models of Indian, Indonesian, Philippine, Malaysian, South African and Zambian firms. As shown below, while there exist some differences, similarities abound in start-up investment across NIC firms. Specifically, the effects of ODA per capita, firm type and a number of workers, and to a lesser extent market capitalisation and broad money, on domestic private ownership were generally consistent across the NICs. In the same way, the effects of firm type, number of workers and ODA per capita, and to a lesser extent technology intensity and FDI, on foreign private ownership were generally consistent across the NICs.

### 4.2.1. *India*

Start-up investment of India are shown in Table 3.

**Table 3.** SEM regressions: India start-up investment.

Domestic private ownership	Estimate	Standard error	Z-Value	p-Value
Intercept	101.714	1.329	76.511	0.000
ODA per capita	0.811	0.322	2.522	0.012
Internal working capital	0.003	0.002	1.533	0.125
Banking sector credit	−0.082	0.039	−2.101	0.036
Foreign private ownership	Estimate	Standard Error	Z-Value	p-Value
Intercept	−3.067	1.289	−2.379	0.017
ODA per capita	−0.708	0.308	−2.303	0.021
MVA per capita	−0.012	0.005	−2.343	0.019
Firm type	0.176	0.094	1.868	0.062
Banking sector credit	0.145	0.051	2.821	0.005

### 4.2.2. *Indonesia*

Start-up investment of Indonesia are shown in Table 4.

**Table 4.** SEM regressions: Indonesia start-up investment.

Domestic private ownership	Estimate	Standard error	Z-Value	p-Value
Intercept	100.812	3.795	26.564	0.000
Number of workers	−0.031	0.027	−1.134	0.257
Firm type	−22.854	8.194	−2.789	0.005
Market capitalization	−0.258	0.162	−1.595	0.111
Foreign private ownership	Estimate	Standard error	Z-Value	p-Value
Intercept	245.387	105.274	2.331	0.020
Number of workers	−0.257	0.114	−2.257	0.024
MVA per capita	28.295	7.788	3.633	0.000
Firm type	−2.811	1.249	−2.250	0.024
Broad money	2.320	1.799	1.290	0.197
Non-resident bank loans	100.812	3.795	26.564	0.000



#### 4.2.3 Philippines

Start-up investment of Philippines are shown in Table 5.

**Table 5.** SEM regressions: Philippines start-up investment.

Domestic private ownership	Estimate	Standard error	Z-Value	p-Value
Intercept	-137.245	67.400	-2.036	0.042
Number of workers	-0.049	0.014	-3.564	0.000
Technology intensity	-8.848	2.235	-3.960	0.000
Firm type	-23.954	3.676	-6.516	0.000
Broad money	3.477	0.943	3.688	0.000
Trade openness	0.603	0.257	2.347	0.019
ODA per capita	0.055	0.053	1.044	0.297
Foreign private ownership	Estimate	Standard error	Z-value	p-Value
Intercept	243.999	67.520	3.614	0.000
Number of workers	0.046	0.015	3.135	0.002
Technology intensity	8.496	2.237	3.798	0.000
Firm type	23.907	3.688	6.482	0.000
Broad money	-3.540	0.945	-3.745	0.000
Trade openness	-0.641	0.257	-2.498	0.012
FDI	0.240	0.226	1.064	0.287

#### 4.2.4. Malaysia

Start-up investment of Malaysia are shown in Table 6.

**Table 6.** SEM regressions: Malaysia start-up investment.

Domestic private ownership	Estimate	Standard Error	Z-Value	p-Value
Intercept	135.533	51.464	2.634	0.008
ODA per capita	0.490	0.249	1.970	0.049
Firm type	-11.347	5.513	-2.058	0.040
Number of workers	-0.025	0.014	-1.801	0.072
Technology intensity	-8.932	3.161	-2.826	0.005
Broad money	0.468	0.330	1.421	0.155
Trade openness	-0.445	0.263	-1.692	0.091
Foreign private ownership	Estimate	Standard Error	Z-Value	p-Value
Intercept	-53.437	45.088	-1.185	0.236
Firm type	9.407	5.418	1.736	0.083
Number of workers	0.025	0.013	1.817	0.069
Unemployment rate	-7.690	4.815	-1.597	0.110
Technology intensity	9.972	3.032	3.289	0.001
Trade openness	0.330	0.234	1.410	0.159
FDI	2.483	1.709	1.453	0.146

#### 4.2.5. South Africa

Start-up investment of South Africa are shown in Table 7.

**Table 7.** SEM regressions: South Africa start-up investment.

Domestic private ownership	Estimate	Standard error	Z-Value	p-Value
Intercept	227.186	69.048	3.290	0.001
ODA per capita	0.976	0.408	2.391	0.017
Internal working capital	-0.041	0.024	-1.744	0.081
MVA per capita	-0.053	0.027	-1.987	0.047
Number of workers	-0.038	0.021	-1.756	0.079
Labour force participation	-2.140	0.964	-2.220	0.026
Technology intensity	3.744	1.668	2.245	0.025
Banking sector credit	0.371	0.178	2.078	0.038
Market capitalisation	-0.082	0.044	-1.847	0.065
Foreign private ownership	Estimate	Standard error	Z-Value	p-Value
Intercept	-36.365	23.529	-1.546	0.122
ODA per capita	-0.636	0.432	-1.471	0.141
Number of workers	0.033	0.021	1.543	0.123
Unemployment rate	1.414	0.632	2.235	0.025
Imported inputs	0.038	0.014	2.614	0.009
Technology intensity	-2.819	1.628	-1.732	0.083
Market capitalisation	0.087	0.045	1.921	0.055

#### 4.2.6 Zambia

As is evident in Table 8 above, despite some differences, the Zambian firms' start-up investment model shares numerous similarities with NIC firm models. Specifically, every independent variable in the Zambian model had a similar effect in at least one NIC model. Notably, ODA per capita in relation to domestic private ownership in Zambia had similar effects in the Indian, Philippine, Malaysian and South African models. Similarly, number of workers in relation to domestic private ownership had similar effects in the Indonesian, Philippine, Malaysian and South African models, with firm type showing similar effects in Indonesian, Philippine and Malaysian models. Similar phenomenon was found in relation to foreign private ownership with firm type having similar effects in the Indian, Philippine and Malaysian models while number of workers had similar effects in the Philippine, Malaysian and South African models.

**Table 8.** SEM regressions: Zambia start-up investment.

Domestic private ownership	Estimate	Standard error	Z-Value	p-Value
Intercept	336.116	142.164	2.364	0.018
ODA per capita	0.193	0.119	1.628	0.104
Internal working capital	0.091	0.044	2.037	0.042
MVA per capita	-1.152	0.411	-2.806	0.005
Firm type	-5.882	4.550	-1.293	0.196
Number of workers	-0.130	0.025	-5.243	0.000
Labour force participation	-2.135	1.532	-1.393	0.164
Technology intensity	-9.606	3.671	-2.617	0.009
Foreign private ownership	Estimate	Standard error	Z-Value	p-Value
Intercept	-69.571	24.405	-2.851	0.004
ODA per capita	-0.201	0.106	-1.891	0.059
MVA per capita	0.905	0.269	3.366	0.001
Firm type	8.657	4.214	2.054	0.040
Number of workers	0.118	0.023	5.058	0.000
Unemployment rate	0.899	0.582	1.544	0.122
Imported inputs	0.029	0.018	1.607	0.108
Technology intensity	8.929	3.405	2.622	0.009

## 5. Discussion

### 5.1. Similarities between efficient NIC and Zambian firm models

Taxation constraints were positively related to access to working capital finance in both efficient NICs and Zambian firms, with Zambian firms reporting taxation constraints having 12.33 percentage points higher access to working capital finance. Taxation has the effect of reducing profit and thus reduces the funds available to repay loans and consequently inhibits loan acquisition. In this vein, the Neoclassical Theory of Investment prescribes reduction in taxation as an investment promotion strategy through the cost of capital reduction channel (Samuel, 1998). It is thus not uncommon for policy makers to offer tax incentives to investors to stimulate economic growth (Fessehaie et al., 2015; Tyson, 2017). The results show that firms at the frontier of access to working capital finance simultaneously reported the highest taxation constraints, implying that the Zambian tax regime may be inhibiting manufacturing finance. As Tyson (2017) suggests, despite there being numerous support and tax incentive structures in Zambia's formal industrial policy, they do not appear to be especially effective. Specifically, the tax regime may be preventing or posing challenges for firms that seek to exploit it to enhance access to manufacturing finance in the pursuit of more advanced financial services or increased access to available financial services. As shown in the NICs, creating an enabling tax environment through such strategies as tax incentives plays a critical role in improving access to manufacturing finance and growing the manufacturing sector. Care should nonetheless be taken to ensure that the incentives benefit the intended subsectors and efficient firms (Chansa et al., 2019; Lee, 2019; Lee et al., 2016). This study thus recommends the continuation of incentivising manufacturing sector investments through fiscal channels while strengthening monitoring and evaluation to curtail investor misuse of such incentives (Gadzala, 2010; Haglund, 2008).

Fixed assets were positively related to access to investment finance in both efficient NICs and Zambian firms, with Zambian firms that had fixed assets having 18.83 percentage points higher access

to investment finance. Collateral plays a significant role in firm access to finance as it guarantees the financier's investment should the business fail, with strong collateral law enforcement further enhancing such access to finance (Beck & Feyen, 2013; Musamali & Tarus, 2013). The natural affinity for financiers to prioritize profit while reducing uncertainty additionally strengthens the case for collateral over the business case (Amornkitvikai & Harvie, 2018; Wasiuzzaman et al., 2019). This finding has extensive literature support, the 2017 Zambia National Financial Sector Development Policy for instance argued that the banking sector is plagued with high collateral requirements (GRZ, 2017), a view supported by Fessehaie et al. (2015). The case for collateral has been found in numerous other settings such as in Ethiopia, where Fanta (2012) notes that availability of collateral was a key enhancer of access to bank financing, adding for instance that owning a non-residential building significantly increased the chances of obtaining a bank loan. Wasiuzzaman et al. (2019) in the Malaysian manufacturing sector also found collateral positively related to creditworthiness, arguing that SMEs that offer financiers collateral are accorded more access as they reduce the financier's risk. This study thus recommends the promotion of capital formation and accumulation among manufacturing firms through tax incentives.

Capacity utilisation was negatively related to access to investment finance in both efficient NICs and Zambian firms with a unit increase in capacity utilisation in Zambian firms resulting in a 0.13 percentage point decrease in access to investment finance. This follows natural reason, the more capacity for growth the more financiers are willing to offer financial resources to exploit the underutilised capacity, conversely, the lesser capacity for growth the less likely financiers are willing to offer financial resources. As argued by Tyson (2017), investors typically finance operating firms that can grow, as opposed to green-field investments which implies higher risk because they have not been tested on the associated market. The results are consistent with Wasiuzzaman et al. (2019) who found that growth potential was positively related to credit worthiness and access to finance among Malaysian manufacturing SMEs. With financiers drawn to the growth potential signalled by low-capacity utilisation, policy may tease out the growth in firms directly by promoting accelerator programs and innovation hubs.

## **5.2. Differences between efficient NIC and Zambian firm models**

While limited liability companies were associated with lower access to working capital finance among the efficient NIC firms, they were associated with a 14.56 percentage point higher access among Zambian firms. The difference in effects may be due to the differences in formal firms' attitudes to sourcing working capital externally and the value placed on business formalisation in the two settings. Beyond limited liability firms in NICs showing lesser appetite for financing working capital externally, business formalisation in Zambia is associated with stronger governance and transparency, reducing the likelihood of moral hazard (Amornkitvikai & Harvie, 2018; Musamali & Tarus, 2013). Limited liability companies in Zambia carry numerous statutory compliance transparency obligations related to taxation and labour. This state transparency filter enhances the odds of successful external financing for limited liability companies above other forms of business institution. This is especially the case in developing countries rather than NICs where higher business formalisation is the rule rather than the exception, noting that the share of limited liability companies among efficient NIC firms is about twice that of Zambian firms (World Bank, 2021). In explaining similar results, Musamali and Tarus (2013) introduce the significance of the firm's ability to honour financial obligations beyond the owner's capabilities. Specifically, they argue that limited liability companies have the property of continuing to exist and honour their commitments beyond the founder's longevity, giving assurance to the financier. Mertzanis (2017) despite finding mixed results, makes a similar case, arguing that limited liability companies offer financiers greater transparency and stronger governance, consequently improving their access to finance. Policy may thus promote higher levels of business formalisation to enhance manufacturing finance by streamlining registration and compliance requirements, and incentivising such formalisation with preferential government financing through such institutions as Citizens Economic Empowerment Commission.

In the efficient NIC firms' case, an extra worker raised access to working capital finance while an additional worker reduced access to working capital by 0.01 percentage points in the Zambian case. While there is a difference, the number of workers coefficients in both models were very close to zero. This study included both number of workers and revenue in the same analysis, a novel departure from

mainstream literature such as Mertzanis (2017), Musamali and Tarus (2013) and Rasiah (2011). This approach was meant to distinguish between the firm's earning and number of workers to expose their varying effects in the context of varying labour-capital ratios between NICs and developing countries in the manufacturing sector. Discounting revenue effects, hiring more workers in a highly industrialised setting may imply hiring more specialised workers in the core and support functions such as financing and investment, leading to higher investment in financing capacity and thus better access to finance. This rationale does not appear to hold in the Zambian case, where hiring more workers may be a function of low industrialisation than investment in higher skilled core or support personnel with finance specialisation.

In the efficient NIC firms case, annual sales had a negative effect on access to working capital finance while a million kwacha increase in sales in the Zambian case raised access by 0.01 percentage points. While high annual sales among efficient NIC firms appears to imply firms that have such high revenues that they finance their working capital internally, the Zambian case appears to be different. The Zambian case suggests that high revenue firms still require external financing. This disparity is consistent with the financial system liquidity constraints endemic in Zambia relative to NICs and the use of high revenue as a success factor in loan applications (Amornkitvikai & Harvie, 2018). The results are further consistent with Wasiuzzaman et al. (2019) who study Malaysian manufacturing firms and argue that credit worthiness and access to finance are strongly influenced by a firm's capacity to repay credit, which is strongly linked to its sales. The predominance of small firms (less than 20 employees) in Zambia's manufacturing sector, accounting for about 39 percent compared to large firms (greater than 99 employees) which accounted for about 24 percent in 2019 coupled with low technology intensity (OECD, 2011; World Bank, 2021) gears the manufacturing sector towards low output and thus lower access to manufacturing finance. In this view, policy may promote conglomeration of existing firms and large business formation to enhance access to manufacturing finance.

Lastly, a million increase in the population of the firm's host city in Zambia raised access to investment finance by 5.74 percentage points. With population used as a proxy for urbanisation, the result follows natural logic, bigger cities have more financial institutions and easier monitoring infrastructure relative to smaller ones (GRZ, 2014, 2017). Specifically, bigger cities have easier transport and communication channels through which financiers can monitor the business performance of their investment through site visits and virtual interaction (Mertzanis, 2017). Further, bigger cities provide bigger markets onto which firms can sell their output from production growth, increasing the business case of an investment finance application. This argument is supported by Fanta (2012), who finds the existence of a market to be the major driver behind manufacturing firms' production capacity expansion plans. In addition, Mertzanis (2017) argues that firms located in urban areas in close proximity to the financiers have higher chances of accessing finance due to the availability of soft qualitative information about the firm, further finding evidence that firms that operate outside large cities face more binding financial constraints. In the current context, the 2017 Zambian National Financial Sector Development Policy notes that while only 15 percent of MSMEs are unbanked in urban areas, about 85 percent are unbanked in rural areas, highlighting the scarcity of financial services in rural areas (GRZ, 2017). Furthermore, a 2014 Zambian Manufacturing Sector Study highlighted that information asymmetry in access to finance affected manufacturing SMEs in rural areas more than it did SMEs in urban areas (GRZ, 2014). With population growth fairly stable and difficult to influence in the short term, delineating the benefits of a large population from the actual population may be helpful in policy formulation. Specifically, policy may promote geographical coverage in financial institutions through tax incentives or moral suasion to enhance access to financial services.

### **5.3. Start-up investment**

ODA per capita in relation to domestic private ownership in Zambia had a similar effect in the Indian, Philippine, Malaysian and South African models, with an additional foreign aid dollar in Zambia associated with a 0.19 percentage point increase in domestic private start-up investment. On the other hand, ODA per capita in relation to foreign private start-up investment in Zambia had similar effects in the Indian and South African models with an extra foreign aid dollar in Zambia associated with a 0.2

percentage point decrease in foreign private start-up investment. Rajan and Subramanian (2011) argue that aid has the effect of over appreciating the exchange rate and adversely affecting the exportable industries. An overvalued domestic currency has two effects on foreign private start-up investment. Firstly, it reduces the value of foreign currency and thus discourages foreign investors from starting up businesses. Secondly, it makes exports less competitive on the international markets. With foreign private investors in the manufacturing sector typically interested in scaling up to regional markets, foreign private start-up investment gets negatively affected (Amornkitvikai & Harvie, 2018). Further, Inanga and Mandah (2008), note that foreign aid in Zambia has been a large source of manufacturing finance, citing the case of the Enterprise Development Fund, where manufacturing was the largest and second largest beneficiary under two respective subcomponents of the fund. In the same vein, Benmamoun and Lehnert (2013) find strong evidence of the developmental effects of ODA in low-income countries, arguing for the optimisation of aid receipts by channelling them into domestic private start-ups. Lastly, Tsaurai (2018) argues that the complementarity effects of aid and financial development have positive effects on economic growth. Specifically, foreign aid through its reinforcing of the financial sector may lead to economic growth, manufacturing sector growth along with it, as seen in NICs (Benmamoun & Lehnert, 2013; Fischer, 2018; Lee, 2019; Prasad & Nickow, 2016). Summarily, foreign aid influences manufacturing finance through numerous channels with evidently opposite effects on domestic and foreign private start-up investment. It increases the domestic financial resource pool, enhancing domestic private start-up investment directly through cash transfers and indirectly through the financial development complimentary channel. Foreign aid conversely has negative effects on foreign private start-up investment through the over appreciation of the exchange rate which reduces the value of foreign currencies and discourages foreign investment. Policy should nonetheless ensure that its negative effects are minimised, specifically, foreign aid directed at manufacturing firm creation may be channelled through the commercial financial system to enhance the veracity of the funded enterprises, as was implemented through the Korea Development Bank in South Korea (Lee, 2019).

Internal working capital in relation to domestic private start-up investment in Zambia had a similar effect in the Indian firms start-up investment model, with a percentage point increase in internal working capital in Zambia associated with a 0.09 percentage point increase in domestic private start-up investment. Using internal working capital as a proxy for the affinity to finance business start-ups internally or through family and friends, this result appears to follow natural reason. Specifically, domestic private start-ups are positively associated with internal financing as they typically lack the start-up resources necessary to secure external financing such as collateral (Amornkitvikai & Harvie, 2018). This result is supported by Fanta (2012) in the case of Ethiopian manufacturing SMEs, who finds that 76 percent of SME owners believed raising start-up investment was the most daunting challenge in setting up a firm, additionally noting that in developing countries, financier rigidity on collateral requirements is a major impediment to manufacturing development. Policy may remedy this in two ways. Firstly, promotion of innovation hubs may strengthen nascent business projects into fully fledged bankable projects. Secondly, government may mainstream credit guarantee schemes for well vetted manufacturing projects.

MVA per capita in relation to domestic private start-up investment in Zambia had a similar effect in the South African case with a dollar increase in manufacturing value added in Zambia associated with a 1.15 percentage point decrease in domestic private start-up investment. MVA per capita in relation to foreign private start-up investment in Zambia had a similar positive effect in the South African case with a dollar increase in manufacturing value added per capita in Zambia associated with a 0.91 percentage point increase in foreign private start-up investment. Changes in manufacturing output affects start-up investment through numerous channels. Firstly, holding incomes constant, an increase in manufacturing output has the effect of increasing consumption expenditure and reducing the domestic savings required to pursue investment. Specifically, when there is more and newer products on the market, consumers spend their disposable income on final consumption reducing the resources necessary to build new firms. On the other hand, a booming manufacturing sector may be attractive to foreign private investors as their financial resources are not incumbered by domestic final expenditure in their drive to exploit the value chain opportunities presented by a thriving manufacturing sector. The corollary is also true, FDI has the effect of enhancing manufacturing sector output. These results are consistent with



Benmamoun and Lehnert (2013), who find a positive relationship between FDI and growth, arguing that foreign investment may stimulate local supply of inputs, thereby enhancing overall output. In the same way, Keskinsoy (2017) finds that besides enhancing technology transfer and managerial knowledge, foreign investment has the effect of boosting economic growth. In the current context, the 2019 Zambia Foreign Private Investment and Investor Perceptions Survey showed that domestic economic growth was the foremost significant factor influencing foreign investors among macroeconomic and financial variables (BoZ et al., 2019). Evidently, the significance of foreign investment to the manufacturing sector is invaluable and policy needs to continue promoting foreign investment while ensuring that it is focused on developing domestic value chains and transferring technology and remains aligned to the country's long term national development strategy.

Firm type in relation to domestic private start-up investment in Zambia had similar effects in Indonesian, Philippine and Malaysian models with limited liability firms in Zambia associated with 5.88 percentage points lesser domestic private start-up investment. On the other hand, firm type in relation to foreign private start-up investment in Zambia had similar effects in the Indian, Philippine and Malaysian cases with limited liability companies associated with an 8.66 percentage point increase in foreign private start-up investment. These results follow natural reason. Foreign investment regulations in Zambia place restrictions on foreign investment inflows, such restrictions further tend to gear foreign start-ups higher on the hierarchy of business formalisation. The 2017 Zambia Development Agency for instance notes that while there's no investment limit, investor permits or eligibility for tax incentives require minimums of USD 250,000 and USD 500,000, respectively (ZDA, 2017). Such gearing inadvertently leads foreign start-ups to higher institutional formalisations as higher amounts require more transparency and accountability. On the contrary, domestic start-up investments may have more incentive to start out informal and later drift to more formal organisational structures because of the high bureaucratic burden of more formal organisational structures. As argued above, policy may promote higher business formalisation through streamlining compliance requirements and attaching higher formalisation to government enterprise financing programs.

Number of workers in relation to domestic private start-up investment in Zambia had similar effects in the Indonesian, Philippine, Malaysian and South African models with an extra worker in Zambia associated with a 0.13 percentage point decrease in domestic private start-up investment. On the other hand, number of workers in relation to foreign private start-up investment in Zambia had similar effects in the Philippine, Malaysian and South African cases with an extra worker in the Zambian case associated with a 0.12 percentage point increase in foreign start-up investment. These results are consistent with literature and common reason, domestic private start-ups are generally smaller and consequently hire fewer workers with lesser inclination towards scaling. Foreign private start-ups on the other hand tend to be larger and more sophisticated with higher gearing towards scaling. Expectedly, domestic start-ups typically struggle with resource mobilisation and therefore pursue smaller holdings compared to foreign start-ups. These results can further be confirmed by simple correlation analyses which show that while the correlation between foreign private ownership and number of workers among manufacturing firms in Zambia was 0.42, the correlation between domestic private ownership and number of workers was  $-0.38$  (World Bank, 2021). As argued above, policy may promote business incubation hubs to enhance the scalability of domestic start-ups.

Labour force participation in relation to domestic private start-up investment in Zambia had a similar effect to the South African case, with a percentage point increase in the labour force participation rate in Zambia associated with a 2.14 percentage point decrease in domestic private start-up investment. This result follows natural logic, the more people participate in the labour force, the lesser time they have to pursue engaging entrepreneurial ventures such as manufacturing. Unemployment rate in relation to foreign private start-up investment in Zambia had a similar effect in the South African case with a percentage point increase in the unemployment rate in Zambia associated with a 0.9 percentage point increase in the foreign private start-up investment. This result follows naturally, increases in unemployment are associated with lower wages. With foreign manufacturing investors increasingly trying to minimise production costs across geographies, foreign private start-up investment is expected to be positively related to unemployment rate through the wage bill reduction and human resource availability channels (GRZ, 2014). Lee (2019), notes this phenomenon in South Korean firms upwards of 1980s



when they began to move production to developing countries that had cheaper labour costs. These results are further consistent with the 2019 Zambia Foreign Private Investment and Investor Perceptions Survey that found that availability of professional staff was the largest positive influence on foreign investment, followed by social protection, with cost of skilled labour and minimum wage levels respectively recording over 53 percent from the survey participants (BoZ et al., 2019). In this view, to attract foreign investment while ensuring high wages, policy may focus on harnessing an educated and healthy workforce through increased education and health expenditure on one hand and enforcement of health and safety regulations in the workplace (Gadzala, 2010).

Technology intensity in relation to domestic private start-up investment in Zambia had similar effects to the Philippine and Malaysian models with a unit increase on the technology scale associated with a 9.61 percentage point decrease in domestic private start-up investment. On the other hand, technology intensity in relation to foreign private start-up investment in Zambia had similar effects in the Philippine and Malaysian cases with a unit increase in technology intensity in Zambia associated with an 8.3 percentage point increase in foreign private start-up investment. This result is consistent with extant literature, domestic private start-up investments are usually low on the technology intensity scale with generally higher labour-capital ratios (Bwalya, 2006; Chansa et al., 2019; GRZ, 2014). This can be further seen by simple correlation analysis, which shows that foreign private ownership is positively related to technology intensity while domestic private ownership is negatively related to technology intensity (World Bank, 2021). In Zambia, where the bulk of manufacturing technology is imported, the high cost of licensing, installation and staff training tends to bar domestic private start-ups from establishing technologically intensive operations. The staggard technology transfer between foreign and domestic firms does not help the situation. Bwalya (2006) finds little evidence of technology spillovers from foreign to local firms in Zambian manufacturing firms with the productivity of local firms reducing as foreign firms overwhelm a sector. This further exacerbates the already fragile technology uptake among domestic firms, albeit showing signs of technology spillovers through backward linkages to facilitate the domestic supply of intermediate goods for foreign firms (Benmamoun & Lehnert, 2013; Bwalya, 2006). Notwithstanding the foregoing, the 2014 Zambia Manufacturing Sector Study nonetheless argues that FDI infusion in the manufacturing sector prior to the Fifth National Development Plan (2006–2010) was meant to drive up productivity, manufacturing finance and technology (GRZ, 2014). On the contrary, foreign private start-up investment is highly associated with high technology intensity with literature expectedly advocating for foreign investment because of its technology spillover effects (Amornkitvikai & Harvie, 2018; Andersson & Djeflat, 2013; Bwalya, 2006; Lee et al., 2016). To enhance technology adoption in the manufacturing sector, policy while promoting FDI-induced technology transfer may use import tax incentives and research and development tax rebates. Further, the government may finance or conduct base public research and development for further commercialisation, as is common in NICs.

Imported inputs in relation to foreign private start-up investment in Zambia had a similar effect in the South African case with a percentage point increase in imported inputs in Zambia associated with a 0.03 percentage point increase in foreign private start-up investment. This result is consistent with extant literature and can be confirmed with simple correlation analysis, showing that foreign private ownership and imported inputs had a correlation of 0.22 while domestic private ownership and imported inputs had a correlation of  $-0.15$  (World Bank, 2021). Foreign private start-up investments are strongly associated with imported production inputs, this stems from their exposure to international input markets which present more diverse input options relative to domestic input markets (Amornkitvikai & Harvie, 2018). To avoid the input dependence trap experienced in Zambia during import substitution industrialisation (Chansa et al., 2019; Mudenda, 2009), policy may, where possible, incentivise resource-based manufacturing industries.

## 6. Conclusion

This study has compared the econometric models of NICs and Zambian firms across four dimensions; access to working capital finance, access to investment finance, domestic private start-up investment and foreign private start-up investment. It demonstrated that similarities and differences exist between NIC and Zambian firms, and across NICs; showing variations in variable effects across contexts owing to

varying political and economic conditions. While acknowledging that NICs carry more effective manufacturing finance models, the study argues that effective policy learning requires further analyses into the functional level variations in the learning and exemplar countries.

The study demonstrated that firm characteristics and supply-side factors have significant effects on manufacturing finance in Zambia, and policy may leverage such relationships. Summarily, the study recommended, continuation of manufacturing sector tax incentives while strengthening monitoring to curtail abuse; promotion of capital formation and accumulation among manufacturing firms through tax incentives; promoting accelerator programs and innovation hubs; incentivising higher formalisation through government enterprise financing requirements; streamlining limited liability business registration and compliance requirements; promoting conglomeration and large firm formation; promoting geographical coverage of financial institutions; channelling manufacturing firm foreign aid through the commercial financial system; mainstreaming credit guarantee schemes; promoting FDI while ensuring strong guardrails; harnessing an educated and healthy workforce; promoting FDI induced technology transfer and incentivising and facilitating manufacturing sector research and development; and incentivising resource-based manufacturing industries.

The unavailability of objective measurements of taxation and court constraints were the study's key limitations. Self-reported constraints nonetheless fairly approximated the constraints experienced by firms, given that firms are unique and understand their constraints best.

## Disclosure statement

No potential conflict of interest was reported by the author(s).

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**Appendix Table:** variable definitions and sources (compiled data is available on request).

S/n	Type	Variable	Definition	Source
1	Dependent	Access to investment finance	Bank and non-bank financed investment	WB - ES
2	Dependent	Access to working capital finance	Bank and non-bank financed working capital	WB - ES
3	Independent	Annual sales	Price updated annual sales	WB - ES
4	Independent	Banking sector credit	Domestic credit to private sector by banks	WDI
5	Independent	Capacity utilisation	Firm capacity utilization	WB - ES
6	Independent	Courts as a constraint	Firms reporting courts as an obstacle and courts as a major constraint	WB - ES
7	Dependent	Domestic private ownership	Proportion of private domestic ownership in a firm	WB - ES
8	Independent	Firm type	Limited by liability firm legal status	WB - ES
9	Dependent	Foreign private ownership	Proportion of private foreign ownership in a firm	WB - ES
10	Independent	Imported inputs	Proportion of total inputs that are of foreign origin	WB - ES
11	Independent	Internally financed working capital	Proportion of working capital financed by internal funds	WB - ES
12	Independent	Manager's experience	Years of the top manager's experience working in the firm's sector	WB - ES
13	Independent	Market capitalisation	Market capitalization of listed domestic companies (% of GDP)	WB /IFS
14	Independent	MVA per capita	Manufacturing value added per capita (constant 2015 US)	WDI
15	Independent	Net ODA received per capita	Net ODA received per capita (current US\$)	WDI
16	Independent	Number of workers	Number of workers in the firm	WB - ES
17	Independent	Taxation as a constraint	Firm identifying tax rates and tax administration as major constraints	WB - ES
18	Independent	Technology intensity	OECD technology intensity classification based on firm ISIC code	OECD/WB - ES
19	Independent	Unemployment rate	Unemployment, total (% of total labour force)	WDI
20	Independent	Trade openness	Total trade share of GDP	WDI
21	Independent	Foreign direct investment	Foreign direct investment, net inflows (% of GDP)	WDI/IFS
22	Independent	City population	Population of host city	ZSA
23	Independent	Fixed assets	Firm bought fixed assets	WB - ES
24	Independent	Broad money	Broad money (% of GDP)	IFS
25	Independent	Labour force participation rate	Labor force participation rate, total (% of total population ages 15+)	WDI