WHAT IMPACTS INFORMALITY? EVIDENCE FROM SELECTED ASIA-PACIFIC ECONOMIES

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ABSTRACT

The present paper seeks to empirically verify the question: what impacts informality? The paper is based on recent analyses of cross-sectional data obtained from various sources for selected Asia-Pacific countries covering the period 2016 to 2019. It makes use of the path analysis technique and Stata-15 software. The findings presented here suggest that human development and poverty rates negatively and significantly impact informality. This empirical exercise makes the case for human capital development strategies by leveraging digital technologies on the one hand and "one-time big-push" poverty reduction interventions on the other to avoid the poverty-informality trap. In addition, by finding a positive and significant relationship between tax revenue and informality, the paper suggests for tax rationalization policies so that informal sector firms are incentivized to pay taxes and become formalized instead of hiding out. The paper also advocates for well-conceived, reality-tailored policies for the formalization of the informal sector by addressing the underlying causes of informality so that economic growth gets spurred in these economies.

Keywords: *Informality, human development, digital adoptions, poverty rate, domestic tax revenue*

JEL Codes: J24, J47, J48, J83

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1. Introduction

The existence of informality is a burden on society and indeed one of the pressing issues facing developing economies, irrespective of the region to which they belong. As per the International Labour Organisation (ILO, 2018a), the informal sector absorbs two billion people who represent 61 per cent of the globally employed population. The highest proportion of informality is located in Sub-Saharan Africa (85.8%), followed by the Asia Pacific region (68.2%). Although there are several studies dedicated to informality in countries in other regions of the world, such as Sub-Saharan Africa (SSA) or Latin America and Caribbean (LAC), there is a smaller number of studies dealing with informality in the case of selected economies of the Asia Pacific region. This paper is an attempt to fill this research gap.

The term informal sector was coined by Keith Hart (1973) in his anthropological work done in Accra, Ghana. Despite growing interest in the informal economy, the views, and attitudes towards it are different (Aryeetey, 2015). Some associate it with a hidden, black, parallel, shadow, second, or underground economy or sector (see Elgain and Oztunal, 2014). Others regard it as a spontaneous and creative response to the capacity of the formal economy to satisfy basic needs. Development economists look upon the informal sector as a 'temporary alternative to unemployment' and 'a coping mechanism against poverty' (Aryeetey, 2015; Kanbur, 2017). Some hold the "parasite" view of informality. According to this view, informal sector firms enjoy an advantageous position (vis-a-vis formal firms) because they do not pay taxes or do not comply with costly regulations that their formal sector counterparts have to follow. This "unfair" advantage hurts the formal sector in terms of job losses and makes it difficult for them to compete against informal firms (Amin, 2021). According to an estimate, 55 per cent of the formal sector firms (75,137 formal registered firms as per World Bank's nationally representative survey data) reported facing competition from informal sector firms in 135 countries between 2008 and 2018 (World Bank, 2019). Generally, informality comprises those activities that are beyond state regulations (Sinha and Kanbur, 2012). However, in this paper informality implies the percentage of firms that are competing against unregistered firms.

It is widely acknowledged in the literature that a higher incidence of informality represents a burden on society, as it often leads to weaker economic outcomes,¹

¹ in the form of lower per capita income (EG), low level of human development (HD), low productivity, greater poverty etc.

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which can eventually thwart economic growth.² Therefore, informality constitutes the biggest challenge to sustainable growth and development that every country has been striving to attain to raise the standard of living of the masses (World Bank, 2019). The history of developing countries (whether in Sub-Saharan Africa or Asia or Asia-Pacific regions) over the last five decades reveals that informality is not a passing phenomenon as the development economic discourse brings out (Lewis, 1954), rather it appears that "the informal economy is here to stay."³With the globalization of economies, the extent of informalization seems to have further deepened rather than getting shrunk or disappearing (Stallings and Peres, 2000; Carr and Chen, 2002; Harris-White, 2003; and Sinha, 2010) and COVID-19 surely has impacted the informal sector disproportionately (OECD, 2020).

Against this background, it will be highly interesting if we try to empirically verify the question: what impacts informality? A large body of literature has already established that there is a close association between informality and economic growth (Aryeetey, 2015; Sparks and Barnett, 2010; and Levy, 2007). However, there are certainly other variables that can be expected to influence informality on a priority ground. However, this aspect has drawn little attention from researchers. In addition, the research hitherto has been region-specific (World Bank, 2019) or country-specific (Hart, 1973; Levy, 2007; Taymaz, 2009 and Kanbur, 2017). Although there are a large number of studies on the informal sector of countries in Sub-Saharan Africa or Latin America (World Bank, 2019; Sparks and Barnett, 2010; Amponsaha, Agbolaa, and Mahmood, 2021, and Loayza, 1997), a smaller number of studies has been carried out with a special focus on informality in the Asia-Pacific region encompassing a country mix from South Asia, Southeast Asia, and the Pacific region. Therefore, it will be highly relevant if we undertake this exercise to bridge the existing research gap by using a novel technique called path analysis. Section II presents a brief note on the variables included in the model and their sources of data, and section III describes the methodology used in this paper. Section IV presents empirical results with a discussion. The last section summarizes the main findings of the paper with policy implications.

² That is why it is proposed by ILO (2015) that countries have to facilitate the transition from the informal to the formal economy by adopting diverse strategies that are suitable for them according to their national circumstances. (see:https://www.ilo.org/wcmsp5/groups/public/---ednorm/---relconf/documents/meeting document/wcms 41283) PLEASE CORRECT FORMATTING of the website.

³ as Aryeetey (2015) puts it

2. A Note on Variables and Sources of Data

2.1 Variables Description

Productivity and Informality

The informal sector and low productivity are closely related (Levy, 2007). Studies argue that the formal sector attracts more productive workers and less productive ones get absorbed or are selected by the informal sector (see, for example, Boeri and Garibaldi, 2005; Albrecht et al., 2009, Galiani and Weinschelbaum, 2012). The variable, therefore, is expected to yield a negative coefficient, as low productivity jobs are generally associated with the informal sector (Deléchat and Medina, 2020).

Human Development (HD) and Informality

The knowledge, abilities, and skill sets embodied in a human being are termed human capital (Osiobe, 2019). Education and health are two important determinants of human capital that we have tried to capture by taking on the Human Development Index (HDI) of the 15 sample countries included in the study. Weak educational attainment reflects a lack of development, which is also a source of informality (Loayza, 2016). Education is indeed an enabler for the acquisition of productive skills and is negatively correlated with the level of education (World Bank, 2019). Globally, it has been observed that as the education level rises (secondary and tertiary education), people/workers are more likely to be employed formally rather than informally⁴ (ILO, 2018ab; Nguimkeu and Okou, 2020). Countries with larger informal sectors are closely associated with lower shares of skilled workers (World Bank, 2019), or higher informality is generally associated with low levels of human development.⁵ Accordingly, the expected sign of the coefficient is negative.

Digital adoption (DIGadp) and HD

It has been argued in a number of studies (Nelson and Phelps, 1966; Benhabib and Spiegel, 1994; Bodman and Le, 2013) that human capital is a facilitator that fosters a faster convergence of economies by way of technology transfers and imports of equipment and technologies. Therefore, digital adoptions become easier in countries with a quality labour force. Bellow et al. (2006) find that information communication technology (ICT) efforts play a very important role in reforming the healthcare system and result in improved outcomes of different dimensions of HD. Therefore, the variable can be expected to yield a positive

⁴ Workers with no education or no skills or low skills or low levels of education may be primarily likely to be absorbed residually in the informal sector.

⁵ Since this sector (a sizeable part of it) competes with the formal sector for low-skilled workers, therefore, the incentives to invest in human capital in the long run (Docquier, Müller, and Naval,2017) gets reduced and the probability of graduation of informal sector workers also get murkier.

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coefficient. Asongu and Roux (2017) in their study related to 49 countries of Sub-Saharan Africa, recognize that ICT adoption can help enhance inclusive (human) development outcomes.

However, there are alternative views also expressed in some other studies (Hameed, 2008; Fong, 2009; and Balouza, 2019), which say that the impact of ICT on human development and its dimensions may not be positive at all times. It may be negative or insignificant depending upon the development situation of the countries and their interaction factors. It is not the accessibility of ICT tools or technologies that is enough; the supported tools⁶must also be made available and are valued by the users (Hameed, 2008). The best example in this regard is that of e-commerce platforms that offer an infrastructure of marketing, warehousing, and commercial relations to small and informal firms, and some of the intrinsic limitations faced by them in participating in larger markets and, ultimately, in becoming part of the formal sector, stand removed. However, studies show that many informal sector firms do not seem to benefit from e-commerce opportunities because of the limited access to digital infrastructure among firms and their target customers, informational barriers to the adoption of new technologies by firms, and the limited capability of firms to profit from e-commerce. Therefore, digital adoptions may not lead to human development and a reduction in informality, as argued in some studies such as by Hameed (2008).

In view of these contending views, the sign of the coefficient of Digadp is uncertain.

HD and Productivity

The crucial role of investment in human capital and innovations on productivity gains and economic growth has been recognized by endogenous growth economists such as Romer (1986, 1990a, 1990b) and Lucas (1988, 1993). Studies at the regional level indicate that training also helps to raise the income of workers and the revenues of firms (Verner and Verner 2005; Burki,Abbas and Shabbir, 1991). The overall productivity levels can be raised by improving the quality of human capital⁷(Mankiw et al., 1992 and Bodman and Le, 2013). Better quality human capital (HC) means that there will be an upsurge in the absorptive (absorption of new ideas or technologies) and innovative capacities

⁶ For example, as Pimienta (2011) says that physical access, access sustainability, access to basic literacy, linguistic localization, technological ownership, empowerment, and social innovation are a must to experience a positive societal impact.

^{7 &}quot;Investing in human capital is the priority to make the most of this evolving economic opportunity. Three types of skills are increasingly becomingimportant in labour markets: advanced cognitive skills such as complex problem-solving, socio-behavioural skills such as teamwork, and skill combinations that are predictive of adaptabilities such as reasoning and self-efficacy. Building these skills requires strong human capital foundations and lifelong learning" (World Bank,2019).

of economies as the adoption of technological changes and products already created by other countries can be facilitated by the capable human capital of any country (Bye and Faehn, 2021). The expected sign of the coefficient is, therefore, positive in normal situations. However, less educated workers with no training or low training will add to informality. Therefore, a low level of human development implies a higher level of informality. The expected sign of the coefficient in this model will be negative.

Poverty Rate and Informality

Many studies (Chong and Gradstein 2007; Loayza, Servén and Sugawara, 2010; Perry et al., 2007; Rosser, Rosser, and Ahmed, 2000) have shown that informality is associated with poverty and inequality as well. We have hypothesized in this model that poverty leads to informality; in other words, informality is the consequence of poverty. We argue that the informal sector absorbs all kinds of poor people, as it offers a variety of jobs for people with no or low skills (domestic servants, car cleaners, cooks, rickshaw pullers, drivers, security guards, cobblers, etc.). It is generally expected that the higher the poverty rate⁸ the higher will be the informality, as poor people will take up any kind of job that comes their way for sustenance. The informal sector is believed to be a residual sector that absorbs excess/surplus/residual workers from the formal sector. For India NCEUS (2007) presented a close association between informality and poverty. It found that the incidence of poverty among unorganized workers was almost four times that of organized workers. Such patterns are universal. It is important to note that the East Asia and Pacific regions are not only becoming urbanized at a fast rate of 3 per cent per annum but also are hosts to the world's largest slum population, many of whom are informally employed. As per estimates, approximately 35 per cent of the urban population (250 million people) lives in slums here (see World Bank, 2019). Therefore, the higher the poverty rate is⁹ the greater the informality would be. The coefficient on Pov is expected to bear a positive sign.

Tax Revenue and Informality

Informality and tax evasion are often used synonymously (Elgin, 2015). It has been well documented in the literature (Dabla-Norris, Gradstein, and Inchauste, 2008; Ordonez, 2014; Joshi, Prichard, and Heady, 2014 and World Bank, 2019) that the higher the tax revenue is,the greater the extent of informality. It is believed by some (see, for example, Rauch, 1991; de Soto, 1989; Gauthier and Gersovitz, 1997) that higher taxes and excessive regulations are among a few reasons that force a firm to remain small in size in developing countries.

⁸ It is important to point out that there are studies that look upon informality as both a driver and the consequence of poverty (La Porta and Shleifer, 2014).

⁹ The workers in the informal sector lack formal contracts, social protection and they tend to be less educated (Deléchat and Medina,2020).

Several empirical studies in Latin America and the Caribbean region (Loayza, 1996; Vuletin, 2008; Ordóñez, 2014) and even low-income countries in East Asia and the Pacific (World Bank,2019) also provide evidence that there exists a strong association between the above-average tax rates (or higher tax revenue) and cumbersome rules and procedures and the level of informality. That is why, the extent of informality is seemingly too large in developing countries. In the light of the findings of these studies, we can expect that the coefficient of the variable tax rate will be positive since higher tax revenue, often an outcome of a higher tax rate, will force firms to remain unregistered to avoid compliance, and this will lead to higher informality.

Domestic Credit and Informality

Firms in the informal sector (especially small and microenterprises in developing countries) often suffer from credit crunch (Beck, Demirgu[°]c,-Kunt, Laeven, & Maksimovic, 2005; Beck, Demirgu[°]c,-Kunt, & Maksimovic, 2008), which further constrains their ability to overcome barriers to entry into the formal sector (Ferreira-Tiyaki, 2008). Accordingly, the sign of the coefficient is expected to be negative. Alternatively, less financial accessibility limits the capacities of a unit to formalize its operations, and therefore, they tend to remain small and unregistered.

Informality and Economic-Growth Relationship

As long as the relationship between the informal sector and economic growth is concerned, there are different schools of thought (Aryeetey, 2015). As per one school of thought, the informal sector has the potential to spur economic growth (EG) and development considering its varied and vibrant nature (Sparks and Barnett, 2010; Amponsaha, Agbolaa, and Mahmood, 2021). The other school argues (e.g.,Levy, 2007) that this sector is stuck with low productivity (Byiers, 2009; Raj and Natarajan, 2007; Taymaz, 2009; Heintz, 2012; and Aryeete, 2015), and technology backwardness (Goldar and Aggarwal, 2019), and therefore accounts for low growth in countries(Levy, 2007, and La Porta and Shelifer, 2014). Even in theoretical models, there is a lack of development along with poor governance,¹⁰ which is believed to cause the emergence of informal activity (Harris and Todaro, 1970; Loayza, 2016 and De Soto,1989). Given these contrasting views, the sign of the coefficient of EG will be uncertain.

¹⁰ We have considered the variable EG in this model. We also tried to include bribes and regulations in the model. However, the variables turned out to be insignificant so we dropped them. We have considered the tax rate in this model as a predictor of informality.

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2.2 Data Sources

Variable (Year)	Notation or proxies used	Variable Description	Source of Data (Various issues)
Informality	Inf	Firms competing against unregistered firms (% of firms)– a proxy for Informality	World Bank. World Development Indicators and International Labour Organisation, ILOSTAT
Labour Productivity	Labpro	The average annual growth rate of output per employed person – a measure for labour productivity	International Labour Organisation, ILOSTAT
Human Development	HD	Human Development Index (a proxy for HD)	United Nations Development Programme, Human Development Report
Poverty	Pov	Poverty rate at National Poverty line (%)	United Nations Development Programme, Human Development Report
Tax Revenue	TAXrev	Tax revenue collected by the central government (% of GDP)	World Bank. World Development Indicators
Domestic Credit	DOMcre	Domestic credit provided by the financial sector (%)	World Bank. World Development Indicators
Economic Growth	GNIPC	Gross National Income per capita (proxy used)	World Bank. World Development Indicators
Digital adoptions (2016)	Digadp	There are three dimensions of digital adoption–Digital Adoption Index (DAI) (Business),DAI (people), and DAI (government) captured by DAI. We have used DAI for the year 2016 as our assumption is that digital adoptions will impact HD or other variables after a time-lag	World Bank, Digital Adoption Index

Table 1: Variable Descriptions and Sources of Data

3. Methodology

The paper is based on recent analyses of cross-sectional data obtained from various sources for selected (15) Asia-Pacific countries¹¹ covering the period 2016 to 2019. In this paper we utilized the path analysis technique (Denis, 2021), which is an extended version of multiple regression. The following three steps are involved in the measurement of the standardized path coefficients in this technique:

Step 1: Construction of a path diagram to provide a visual representation of the relationships that exist between the variables

This is also called model specification which is based on an extensive review of the literature.

Step 2: The estimation of time-varying path coefficients and their interpretation

Step 3: Test of the overall goodness of fit.

It is important to explain a few unique features of this path analysis technique (which is an extension of a multiple regression statistical technique) that gives it an edge over the multiple regression technique. These features are as follows:

- a. In the multiple regression technique, there is only one dependent variable, and it does not allow researchers to see the effects of predictor (i.e., dependent/outcome) variables on a number of different outcomes.
- b. In the multiple regression technique, a variable can be either an independent variable or a dependent variable. However, in the path analysis technique, a variable can be dependent in one relationship and independent in another one. For example, in the modelspecified above in this paper, there are three variables, namely, Inf, HD, and Labpro, that play dual roles. These are dependent in some relationships and independent in others. The latter consideration is closer to reality, which implies that a given variable (for example, see the case of informality in equation 1) may be an outcome with respect to certain variables (please refer to 5 predictors which are there in equation 1) but may become a predictor of other variables (see the same variable 'Inf' in equation 4 wherein 'Inf' is a predictor of outcome variable, EG).
- c. It is recognized in this technique that an exogenous/independent variable can influence the dependent variable directly as well as indirectly. Therefore, there are mediating or intermediate variables in this technique. For example, between Digadp and Inf, HD and Labpro are the two mediating variables, and between HD and informality, there is one mediating variable, i.e., Labpro.

¹¹ The fifteen countries from the Asia-Pacific region included in this study are: Bangladesh, Cambodia, China, Fiji, India, Indonesia, Lao PDR, Malaysia, Mongolia, Nepal, Pakistan, Philippines, Sri Lanka, Thailand, and Vietnam.

d. In the path diagram, the hypothesized relationship is depicted through arrows (single-headed arrows) and wires (double-headed arrows). The arrows indicate the cause for the independent, intermediate, and dependent variables, and wires indicate covariance/correlation between variables. Each exogeneous variable/predictor has a path coming from it. Figure 1 shows a path diagram with exogenous/independent variables and four endogenous/outcome variables (Inf, EG, HD, Labpro) based on the hypotheses formulated by us after performing an extensive literature review. Each outcome variable has at least one path leading to it. The standardized

- Each outcome variable has at least one path leading to it. The standardized path coefficients are mentioned on each path. The random terms are tacked on the endogenous variables, highlighting the assumption of the multiple regression model that the outcome variable will be measured with some degree of error.
- e. Another unique characteristic of this path analysis technique is that it enables us to parse the total effect of a variable into direct and indirect effects. For example, in this particular model, there are two variables, viz. HD and Digadp, which impact labour productivity directly (see equation 2 in Table 2), and labour productivityin turn affects informality. These variables also have an indirect effect on informality via the mediating effect of labour productivity in the case of HD (HD _Labpro _Inf) and via the mediating effects of HD and Labpro in the case of Digadp ((Digadp _HD _Labpro _Inf). This technique helps us to identify the factors that act on informality (Inf) directly (such as HD and Labpro) and indirectly (such as Digadp affecting HD and Labpro).

A direct effect of HD on Inf is (-235 as exhibited by the arrow directed from HD to Inf). The direct effect of HD on Inf is = -235. However, the indirect effect of HD on Inf works via the mediating variable, i.e., in this case, Labpro. The indirect effect is obtained by multiplying the coefficients for each path, e.g.,

HD_Labpro_Inf is
$$(2.1^* - .82) = -1.722...$$
 (i)

Therefore, the indirect effect of HD on Inf is negative and stands at -1.722.

Total effect of HD on Inf= Direct effect +indirect effect= [-235+ (-1.722)]= (-236.7)

Digadp_HD_Labpro is (.42*2.1) = 0.882... (ii)

Therefore, the indirect effect of Digadp on Inf is positive and stands at 0.882.

The direct effect of Digadp on Labpro = -1.6

The overall effect of Digadp on Labpro = [-(1.6) + (.882)] = (-0.718).





Figure 1: Path Diagram

Note:(i) The standardized path coefficients are mentioned on each path, and co-variances are mentioned oneach wire.(ii) The random terms are tacked on each endogenous variable of the model. (iii) The figures given on the right-hand corner in each rectangle and that too in the case ofendogenous variables/outcome variables (such asInf,HD,Labpro,EG) represent the intercept terms of each equation.(iv) The two figures given on the top and bottom and on the right-hand corner in each rectangleand that too in the case of exogenous variables (predictors) represent mean and variance of thevariable, respectively.

Source: prepared by the author; This diagram is her visualization based on extensivereview of literature.

4. Results and Discussion

We carried out path analyses by using maximum likelihood estimation in STATA15.0 to identify the factors that impact informality. We will explain the multivariate regression results of four outcome variables, namely, informality (Inf), economic growth (EG), human development (HD), and labour productivity (Labpro), one after another.

Sl.No	Outcome Variables	Predictors	Coefficient estimates
1.	Inf	1.Labpro	-0.8249
			(0.546)
		2.HD	-235
			(0*)
		3.Pov	-1.5332

Table 2: Path Coefficients for Predictors Using the Maximum Likelihood Method

			(0.002*)
		4.TAXrev	0.4379
			(0.003*)
		5.DOMcre	-0.043
			(0.588)
2.	Labpro	HD	2.1474
			(0.876)
		Digadp	-1.6181
			(0.825)
3.	HD	Digadp	0.4237
			(0*)
4.	EG	Inf	-187.7832
			(0.003*)

Note:(i) The values in parentheses are the p values, and (ii) * indicates a 0.01 level of significance. (iii) We have not shown the intercept in the table.

Source: Author's calculations

1. Let us explain the multivariate regression results of the outcome variable, namely, informality (Inf).

The intercept of Inf (informality) = 253.3755 (not shown in Table 2 but given in the path diagram), the value of informality when all predictors (Labpro, HD, Pov, TAXrev, and DOMcre) are zero.

As is evident from Table 2, there are five predictors of Inf. The slope coefficient of three variables viz. HD, Pov, and TAXrev are highly significant at a 1% level of significance.

The estimated slope coefficient of Labpro $(b_1^{\text{Labpro}}) = -.8249$ shows that for every unit increase in Labpro, INF decreases by .8249. This is consistent with the studies performed by Ordonez (2014) and Levy (2007).

The estimated slope coefficient for HD (b_2^{HD}) = -235 for predicting informality. The negative association between the two variables signifies that for every increase in HD holding other variables constant, informality is reduced by 235. This finding provides support for the studies performed by Nguimkeu and Okou (2020), the World Bank (2019) and the ILO (2018). If the extent of informality is to be reduced in the sample countries, then countries must spend on the capacity building or training of workers, currently absorbed in the informal sector.

The estimated slope coefficient of Pov (b_3^{Pov} =-1.5332)indicates that for every unit increase in the poverty rate (keeping other variables constant), Inf decreases by 1.5332. The results obtained are contrary to the majority of literature that argues that there is a positive association between the poverty rate and informality.

It is important to mention that even our expectation of a positive association between the two variables isnottrue. The negative relationship between Pov and Inf (as we obtained) seemingly lends support to the results that emerge from the field experiments¹²performed in Bangladesh by a group of economists from the Massachusetts Institute of Technology(MIT) (Balboni et al., 2022). Factually speaking, a higher poverty rate cannot correct/reduce informality of its own unless and until some interventions are made by governmental or nongovernmental bodies. We argue that at a higher poverty rate, a "big push" antipoverty programme (in the form of capital boost or complementary training and support) representing significant "one-time intervention" (as suggested by empirical work of Balbori et al., 2022) can work and help people escape the poverty trap. We can extend the argument advanced by Balboni et al. (2022) and justify the negative sign of the coefficient of poverty by saying that informality can be reduced by accumulating assets and obtaining better occupations (as has been argued by Balboni et al., 2022) and that this will happen through a "onetime big" interventionist approach.

The estimated slope coefficient of TAXrev (b_4^{TAXrev} =.4379) implies that for every unit increase in TAXrev (given other variables), informality increases. Our finding is in keeping with the studies (Dabla-Norris et al., 2008; Ordenoz,2014 and World Bank, 2019) done earlier that assert that lack of tax incentives may force firms to stay small by hiding out or by not registering themselves, which amounts to a loss of revenue for the state and at the same time points towards the poor state of enforcements in these developing economies. A well-thought-out and well-designed simple and uniform tax system with lower tax rates and no loopholes helps reduce informality (Dele chat and Madina, 2020).

The estimated slope coefficient of DOMcre (b_5 DOMcre = -0.043). This means that with every unit increase in DOMcre, informality decreases. However, this result is insignificant. This result supports a study done by Capasso and Jappelli (2013) that argues that financial development (reflected in availability of DOMcre) leads to a decline in the cost of external funds and causes a decline in the size of the informal sector. Dele chat and Madina (2020) also argue in favour of policies that enhance financial inclusion by promoting bank-based financial deepening to lower informality. The studies show that in Asian regions, size-induced market failures are prevalent, and one of the major reasons for such market failures is the inaccessibility of credit for informal firms, which makes their survival difficult and hurts their growth. Lack of access to credit/ credit gaps for formal vs. informal sectors are the causes of high informality in the case of several countries in the region (Dele chat and Madina, 2020 and Vandenberg et al., 2016).

¹² The scholars from Massachusetts Institute of Technology (MIT)did a long-run project of 23,000 households in 1,309 villages for 5 years and this was administered by a major NGO named BRAC (Building Resources across Communities) in Bangladesh.

2. Explaining the multivariate regression results of the outcome variable,

namely, Labpro The estimated slope coefficient for HD (b_1^{HD}) =2.1474 for predicting Labpro. It indicates that for every one-unit increase in HD holding other variables constant, labour productivity increases by 2.1474. This is in keeping with the arguments advanced by Romer (1986, 1990a, 1990b), Lucas (1988,1993), Mankiw et al. (1992), and Bodman and Le (2013). This implies that improved access to quality education and ample technical and vocational training opportunities can enhance the productivity of workers in the informal sector. However, the coefficient of HD is not significant, implying that the state has to take steps to ensure that the expenditure incurred on human development strategies is translated into productivity gains. Similarly, the second predictor, namely, Digadp, has a negative influence on productivity, and the coefficient isinsignificant too. This result is in keeping with the studies done by Hameed (2008) and Pimienta (2011).

3. Explaining the multivariate regression results of the outcome variable, namely, HD

The multivariate regression results of the outcome variable, namely, HD, show a positive and significant association with the predictor Digadp. The coefficient of Digadp is 0.4237 and is significant. However, in the case of outcome variable Labpro, the predictor HD bears a positive sign, but the coefficient (= 2.1474) is notsignificant, as has been explained above.

4. Explaining the multivariate regression results of the outcome variable, namely, EG

Similarly, the multivariate regression results of the outcome variable, namely, EG, indicate that there exists a negative and significant relationship between EG and informality. This is exhibited by the negative sign of the coefficient, which stands at -187.7832, and the P value is highly significant at 1%. An increase in the informality implies a decrease in economic growth. There are many studies that support this result (Dele chat and Madina, 2020; World Bank, 2019; La Porta and Shelifer, 2014; Levy, 2007).

Determining the Fitness of the Model

Once the model is estimated, the next step is to determine whether the model is saturated or the best-fit model. There are a variety of fit indices, such as the chisquare (X), root mean square error of approximation (RMSEA), comparative fit index (CFI), and standardized root mean square residual (SRMR), which can be used for this purpose (Hooper et al.,2007). In the case of our model, the comparative fit index (CFI) and the Tucker-Lewis index (TFI) statistics are 0.935 and 0.941, respectively. As per the acceptable threshold limits for these

relative fit indices, if the value of these two statistics is closer to one (cutoff value >/= 0.90), then the model is considered to be a well-fit model. Our model is the best-fit model according to the CFI and TFI statistics. In addition, RMSEA (the observed value from path analysis = 0.0579* and it is significant too) also suggests that this model is a good-fit model. The value obtained is significant at a 1% level of significance.

5. Conclusions and Policy Implications

This paper attempts to identify what impacts informality in the selected Asia-Pacific economies (15 in number) from South and Southeast Asia by using cross-sectional data (varying from 2016 to 2019) and applying the path analysis technique.

The main findings of the study are that human development impacts informality negatively and significantly. This is in keeping with our hypothesis and the vast economic literature on the subject as well. The direct but negative effect of human development on informality outweighs its indirect (and negative) effect on informality via the mediating variable labour productivity. The study clearly shows that policies targeting the capacity building or training of workers currently absorbed in the informal sector are imminent. A tailored approach towards capacity building and skill development keeping in view the heterogeneity of firms operating in the informal sector will be required to address the challenges associated with a low level of human development in the informal sector.

The present study also reveals that the overall impact of HD (direct as well as indirect) on labour productivity (Labpro) is not only negative but also insignificant. This is essentially due to the low quality of the labour force employed in the informal sector. This might also be attributed to underinvestment in good practices,¹³ which can invigorate productivity cycles. There are studies (Fajnzylber, Maloney and Montes-Rojas 2011; La Porta and Shleifer 2014; Monteiro and Assuncao, 2012) that have well documented the gaps in the performance of formal versus informal sector firms. They reported that formal sector firms are 30 per cent more productive (in terms of value added per employee) than informal sector firms. Thus, it is important for many Asia-Pacific economies (included in the study) to resolve their productivity puzzle on an urgent basis, as these can become further aggravated because of the challenge posed by ageism in many of them.

Digital adoption (Digadp) has a negative and larger direct effect on labour productivity. However, the study also notes its positive effect on Labpro via human development. However, the net effect of DIGadp on productivity is

¹³ Garton (2017) argues that the productive power of workers can be unlocked by investing in better practices in time, talent, and energy management (see:https://hbr.org/2017/09/the-case-for-investing-more-in-people).

negative. This may be because of 'technostress' or the adverse psycho-social effects of digital adoptions on the well-being of people. This calls for the need for decent work for all, which ensures "dignity, self-fulfilment and a just sharing of the benefits for all" (UNCTAD, 2020).

The positive (indirect) effect of digital adoption on labour productivity via human development may be an outcome of the increase in the platform economy and the rise in non-platform-based work¹⁴ during COVID-19. In the latter case, minimal education with an ownership of mobile phones and access to a bank account are the requirements for such low skill jobs.¹⁵ For example, the case in point is that of the food delivery persons/workers hired by food aggregators such as Zomato and Swiggy in the case of India and managed via digital management systems.¹⁶ Indeed, the knowledge and use of technology gives them livelihood and adds to their productivity. However, policy makers must monitor the quality of such jobs and review the rights and obligations linked to different types of employment relationships that have emerged during and after COVID-19.

Since digital adoptions and human development share a positive and significant relationship, as per our study, this empirical exercise makes the case for human capital development strategies by leveraging digital technologies. However, the effect of HD (positive) and Digadp (negative) on labour productivity is insignificant (as indicated by the coefficients of HD and Digadp); therefore, there is a need on the part of the government to identify effective strategies to translate the positive effect of human development on productivity and plug the negative effect of digital adoption on labour productivity. This can be done by initiating skill development, customized technology use, capacity building programmes and incentivizing people to undergo such programmes on the one hand and by plugging the digital divide by provisioning digital infrastructure on the other hand.

Our study shows that the poverty rate affects informality negatively and significantly. This result is contrary to our hypothesis and the majority of literature on the subject. The negative relationship between poverty rate and informality (as obtained in this study) seemingly lends support to the recent

¹⁴ It has been found in the case of India that non-platform gig workers are generally casual wage workers and own account workers in the conventional sectors (in retail, transportation, e.g., Uber, and hospitality, e.g., Airbnb) either working on a part-time or full-time basis. In 2020- 21, 7.7 million workers were engaged in the gig economy in India as per estimate. Approximately, 31% of them are absorbed in low-skilled jobs and the concentration of workers in low-skilled jobs is increasing.

¹⁵ https://www.niti.gov.in/sites/default/files/202206/Policy_Brief_India%27s_Booming_Gig_ and_Platform_Economy_2706202

¹⁶ See: The platform economy and the precarisation of food delivery work in the COVID-19 pandemic: Evidence from India – ScienceOpen

results that emerge from the field experiments¹⁷performed in Bangladesh by a group of economists from the Massachusetts Institute of Technology, i.e., MIT (Balboni et al.,2022). Factually speaking, a higher poverty rate cannot correct/reduce informality of its own unless and until some interventions are made by governmental or non-governmental bodies. We believe that at a higher poverty rate, a "big push" anti-poverty programme (in the form of capital boost or complementary training and support) representing significant "one-time intervention" (as suggested by empirical work of Balboni et al. 2022) can work and help people escape the poverty trap and reduce informality too. Balbori et al. argue that informality can be reduced by accumulating assets and obtaining better occupations.

Moreover, the problem of informality persistence might find its solution through the rationalization of tax regimes by respective governments in these countries, as we find that higher tax revenue leads to greater informality. Various studies done earlier (Dabla-Norris, Gradstein, and Inchauste, 2008; Ordonez, 2014; Joshi, Prichard, and Heady, 2014; and World Bank, 2019) reveal that with higher fiscal revenue (often a consequence of a higher tax rate), informal sector firms prefer to hide out and evade taxes. Tax avoidance limits the government's ability to generate revenues for spending on economic and social overhead by weakening the effectiveness of fiscal policies. As mentioned earlier, tax evasion and avoidance and informality work together in these economies because of a lack of enforcement. This study suggests the rationalization of taxes and the tightening of enforcements that are "economically and socially sensible" (Loayza, 2018).

Observing through this model that informality brings down economic growth significantly, the paper advocates human development enhancing and poverty reduction strategies ("one-time big push") along with well-conceived, reality-tailored policies for the formalization of the informal sector by addressing the underlying causes (such as low productivity, credit inaccessibility, higher taxes, etc.) of informality. Indeed, there is a need to explore efficient and effective ways of integrating strategies to check informality to address the development challenges associated with it in the form of poor economic outcomes such as low EG, low HD, low productivity, and higher poverty to boost economic growth. This requires additional and, of course, targeted research.

¹⁷ The scholars from Massachusetts Institute of Technology (MIT)did a long-run project of 23000 households in 1,309 villages for 5 years and this was administered by a major NGO named BRAC (Building Resources across Communities) in Bangladesh.

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