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Exploring the Informal Sector in Nepal: Performance Trend, Dualism, and Rural-Urban Dynamics

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Abstract

We find the informal sector of Nepal, which employs nearly 60% of non-agricultural labour force, to have underperformed between the period 1995/96 and 2010/11. We locate a large performance gap between the 'traditional/non-capitalist' segment, comprising family-based household enterprises that occupy a majority portion of informal sector, and the 'modern/capitalist' segment employing wage labour, which shows heterogeneity existent within the informal sector. We find that, by employing an Ordinary Least Squares (OLS) regression of independently pooled cross sections of enterprises over three rounds of Nepal Living Standard Survey (NLSS 1995/96, NLSS 2003/04, and NLSS 2010/11), the performance gap between the traditional/non-capitalist enterprises and the modern/capitalist enterprises did not lessen over time indicating a persistent dualism within the sector. We further explore the rural-urban dimension of informal sector, through the use of a regression-based decomposition exercise, to find that while the rural-urban differential in informal sector shrunk between the period 1995/96 and 2010/11, it is attributed to the underperformance of urban firms and the stagnancy of rural firms over time. The dismal performance of informal sector, particularly the existence of a large (non-declining) proportion of traditional/non-capitalist segment at a meagre income level, raises question on the possibility of transformation in the sector.

Keywords Informal sector · Dualism · Structural change · Rural-urban divide · Nepal

JEL Classification O17 · J46 · P25

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1 Introduction

There has been extensive literature in recent decades discussing the structural change of an economy from agriculture to industry, particularly following Lewis's seminal work in 1954 (Timmer & Akkus 2008; Storm 2015). Lewis (1954) argued that structural change in an economy is characterised by a shift in labour from low-productivity sectors to high-productivity sectors, resulting in a declining share of the traditional sector in Gross Domestic Product (GDP) as the economy grows. However, in the case of Nepal, the pace of structural change was sluggish between 1980 and 2010, with minimal decline in the agricultural sector's share in GDP and employment, alongside decreasing productivity in the manufacturing sector (Briones & Felipe 2013; Islam 2014; Bhatta 2015). While the GDP growth rate fluctuated between 4% and 5% during this period (Thapa & Shrestha 2005; Islam 2014), the employment challenge arising from such unsatisfactory performance of the economy is reflected in people being compelled to engage in jobs characterised by low productivity and low earnings, leading to the rise of the 'working poor' within the informal sector.

Nepal's informal sector is significantly large, with the informal sector comprising 95.37% of enterprises in the country and employing 58.78% of the non-agricultural labour force, as reported by the National Economic Census 2018 (Central Bureau of Statistics [CBS] 2021). While the concept of structural change typically pertains to the shift of an economy towards high-productivity sectors, it can also be applied to examine the dynamics within less productive sectors, such as the informal sector, in order to analyse the potential for modernisation within this sector. This analysis holds implications for the broader economic transformation occurring in the country, considering the substantial size it holds in the economy. In other words, drawing on various theoretical and empirical literature that identifies heterogeneity within the informal sector (Ranis & Stewart 1999; Mandelman & Montes-Rojas 2009; Raj & Sen 2016; Bhattacharya & Kesar 2018; Kesar & Bhattacharya 2019), structural change in the informal sector implies the homogenisation of this heterogeneity through the enhancement of performance levels among lower-segment firms.

In Nepal, previous studies (Suwal & Pant 2009; Agarwal & Dhakal 2010; Parajuli 2014; ILO 2004) have examined the size of the informal sector, determinants of informality, and the formal-informal divide based on wage differentials. However, these studies have not adequately addressed an important aspect: the performance of informal sector firms over time and the dynamism within the sector, which is crucial for understanding the potential for structural change. In this paper, we aim to fill this gap by investigating the performance trends of the overall informal sector in Nepal from 1995/96 to 2010/11. Furthermore, we explore the heterogeneity or dual structure of the informal sector, which consists of the family-based traditional segment and the wage-labour employing modern segment. We analyse the performance gap between these two segments and also examine the performance differences between urban and rural informal enterprises, considering the spatial dimension highlighted in earlier literature on the informal sector (Harris & Todaro 1970; Hart 1973; Ranis & Stewart 1993).

Our findings reveal a decline in the performance of enterprises in the informal sector over time, as measured by net revenue. The performance gap between traditional enterprises and modern enterprises – modern enterprises had higher net revenue than traditional enterprises by 78.94% in 1995/96 – remained unchanged throughout the study period. This persistent dualism within the informal sector indicates a lack of convergence. While the rural-urban differential in the informal sector did decrease over the period, with urban firms having a 73.28% higher net revenue than rural firms in 1995/96 and 48.62% in 2010/11, this was primarily driven by the underperformance of urban firms and the stagnant performance of rural firms over time. These findings, which include the declining performance of the informal sector, the persistence of dualism, and the absence of growth in both rural and urban enterprises, raise doubts about the potential for structural change or upward mobility within Nepal's informal sector.

The paper is organised as follows: Section presents a concise literature review, addressing the issue of dynamism within the informal sector, the rural-urban dynamics in informal sector, and the potential transition from informality to formality. Section 3 provides a description of the data sources and definitions employed in this study. In Section 4, we analyse in detail the overall performance of the informal sector and explore the existence of duality within the sector, employing descriptive statistics and independently pooled Ordinary Least Squares (OLS) regressions. Section 5 focusses on the spatial dimension of the informal sector and examines the rural-urban divide in enterprise performance through OLS regressions and a Blinder-Oaxaca (B-O) decomposition exercise. Finally, the concluding section discusses the implications of our analysis in understanding the potential for the informal sector in Nepal to reproduce or transform into modern enterprises.

2 Informal Sector, Dualism, and Rural-Urban Dimension

The study of informality can be approached from the perspectives of 'duality' or 'continuum'. Dualists argue that the traditional subsistence sector, characterised by disguised unemployment and zero marginal productivity, has surplus labour that can be shifted to the modern industrial sector without affecting output in the traditional sector (Lewis 1954; Tignor 2004). As the economy grows, it is expected that the proportion of the traditional sector (agriculture/non-capitalist/informal) will decrease due to the expansion of the modern sector (industry/capitalist/formal). This perspective views the informal sector as a residual sector involving subsistence activities and considers the emergence of the informal economy as a temporary phenomenon that will eventually be replaced by a formal sector with economic growth.

In contrast to the dualistic perspective, which posits that the formal and informal sectors operate according to distinct logics (with the formal sector focused on profit maximisation and the informal sector centred on income maximisation and distributing average product to workers regardless of their contribution), the 'continuum' perspective argues that both sectors operate based on the same objective of profit maximisation (De Soto 1989; Maloney 2004). The informal sector is then perceived as a voluntary, entrepreneurial, and unregulated sector comprised of small firms,

rather than a residual sector consisting of disadvantaged workers resulting from poverty. An alternative approach, known as 'petty commodity production,' regards the informal sector as a remnant of pre-capitalist economic structures or a transitional feature currently serving capitalism but expected to eventually disappear as capitalism advances (Moser 1978).

Theoretical and empirical literature from the developing world shows that there exists fundamental heterogeneity within the informal sector in addition to the formal-informal divide. This heterogeneity encompasses a continuum of traditional and modern enterprises, with traditional firms exhibiting a slow pace of modernisation. For instance, the model by Ranis and Stewart (1999) segregates urban informal sector into a dynamic informal sub-sector with linkages to the formal sector, and a traditional static informal sub-sector that absorbs the residual labour force in low-productivity jobs. They argue that in presence of a strong intersectoral linkage with the urban formal sector, such as through subcontracting, the dynamic urban informal sector grows and becomes similar to small and medium enterprises in the formal sector. On the other hand, the traditional informal sector diminishes and eventually disappears. Likewise, a study conducted in India by Raj and Sen (2016) shows that family-operated own-account manufacturing enterprises exhibit the lowest productivity when compared to informal sector enterprises that employ wage workers.

All the literature discussed above supports the idea of an ultimate dissolution of informal sector as the economy modernises. However, recent studies challenge this notion of a linear transition from the traditional/non-capitalist space to the modern/capitalist space with capitalist development (Sanyal 2007; Sanyal & Bhattacharya 2009; Bhattacharya, Bhattacharya & Sanyal 2013; Bhattacharya 2017; Bhattacharya & Kesar 2018; Kesar & Bhattacharya 2019). These studies argue that capitalist growth, characterised by its exclusionary nature, generates a significant amount of "surplus labour" that remains marginalised and unable to find employment in the modern sector. In this context, the informal sector serves as an economic space that offers alternative forms of production, distribution, and redistribution to sustain the livelihoods of this labour force (Sanyal & Bhattacharya 2009). While there is limited research on the informal sector in Nepal within this body of literature, Bhattacharya and Kesar (2018) and Kesar and Bhattacharya (2019) examined the evolution of the informal manufacturing sector in India during a decade of high economic growth (2000/2001 to 2010/2011). Their findings revealed that the non-capitalist segment of the informal manufacturing sector has been reproduced with economic growth resulting in further entrenchment of dualism within the informal manufacturing sector.

We now examine the spatial dimension of understanding the informal sector. Initially, early literature primarily viewed informality as an urban phenomenon, with the urban informal economy providing a source of income for the immigrant surplus labour (Harris & Todaro 1970) and the working poor (Hart 1973). However, this urban-centric perspective eventually expanded to incorporate the rural informal sector, thanks to the influential work on rural non-agricultural activities by Ranis and Stewart (1993). Ranis and Stewart drew upon the earlier research by Hymer and Resnick (1969), who challenged the dualistic view of the traditional rural sector as solely consisting of agricultural activities. Hymer and Resnick shed light on the

presence of diverse "non-agricultural non-leisure activities" in rural areas, such as food processing, spinning, weaving, pottery, and metalworking, which were primarily conducted for subsistence consumption.

In Nepal, it is anticipated that the uneven development pattern favouring urban areas[1] would lead to better performance of informal sector firms located in or near cities, as they can leverage the agglomeration effect of urbanisation, particularly through subcontracting linkages with the formal sector, as suggested by Ranis and Stewart (1999). However, informal sector firms may not always be able to benefit from urbanisation. Although research on the urban informal sector in Nepal is limited, a study by Goldar and Mitra (2013) examining the manufacturing sector in India reveals that small informal sector firms were unable to capitalise on the agglomeration effect, as the increased demand resulting from urbanisation shifted towards the organised (formal) sector, and the subsequent inter-sectoral linkages were weak. Similarly, Bhattacharya and Kesar (2018) found that subcontracting linkages in the informal manufacturing sector in India remained low during a period of high growth (2000/01 to 2010/11). Furthermore, their study revealed that even own account manufacturing enterprises with subcontracting linkages performed worse compared to those without such linkages, with the performance gap widening over the same period (2000/01 to 2010/11).

In the case of rural informal sector, the transformative potential of rural "non-agricultural non-leisure activities" towards rural industrialisation was met with scepticism by Hymer and Resnick (1969). In contrast, Ranis and Stewart (1993), by categorising the rural informal sector into "traditional" and "modern" segments, argued that the traditional segment, which primarily produces traditional goods, can evolve into a modern sector through investments, technology, and strong linkages with agriculture. While there is limited literature specifically focused on the rural non-farm sector in Nepal, a recent study by Adhikari (2022) sheds some light on the subject. Using rural sample household data from NLSS 2010/11, the study found that rural Nepal has a substantial Lewisian surplus labour, which indicates a less developed rural labour market or limited absorption of labour by the non-farm sector. However, conclusive evidence regarding the performance of rural informal sector firms in Nepal is currently unavailable.

Adding to the limited studies conducted on informal sector in Nepal, we examine in this paper the economic performance of informal sector firms over the fifteen-year period between 1995/96 and 2010/11. In addition, drawing upon existing theoretical and empirical literature highlighting the presence of dualism within the informal sector (Ranis & Stewart 1999; Mandelman & Montes-Rojas 2009; Raj & Sen 2016; Bhattacharya & Kesar 2018; Kesar & Bhattacharya 2019), we investigate whether there are any indications of a reduction in dualism within the informal sector. This

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[1] Urban biasness in development can be tentatively perceived from the Human Development Index (HDI) measure estimated separately for urban areas and rural areas. HDI was 0.567 for urban region and 0.384 for rural region in 1996. The same measure was 0.630 and 0.517 respectively for urban and rural areas in 2011 (UNDP 2014, 1998; UNDP & National Planning Commission (NPC) 2014). Furthermore, on the rural-urban divide, Pandey (2011) claims that the economic reforms pushed in the 1990s intensified productive activities in the urban sector and contributed to poverty alleviation by raising income and employment levels in the urban sector while bypassing the rural sector.

reduction could occur through the closure of traditional/non-capitalist enterprises or the transition of these enterprises towards modern/capitalist structures. For this purpose, we categorise informal sector enterprises as either traditional/non-capitalist enterprises (solely operated by household members without a capital-wage relationship)[2] or modern/capitalist enterprises (involving a capital-wage relationship)[2] and analyse the trend of performance gap between the two segments of the informal sector over the study period. Meanwhile, the rural-urban dualism in informal sector also warrants attention amidst the disproportionate development pattern favouring urban centres in Nepal. During the study period, urban informal sector firms could have become more dynamic through strong intersectoral linkage with the formal sector (Ranis & Stewart 1999) while rural informal sector firms might have been worse off with the implementation of liberalisation programmes (Hymer & Resnick 1969). Alternatively, the growth of urban informal sector could have been hampered with the diversion of demand towards formal sector combined with weak subcontracting linkage (Goldar & Mitra 2013) while the rural non-farm sector could have experienced significant progress by establishing stronger linkages with agriculture and leveraging on easier access to technological advancements brought about by globalisation (Ranis & Stewart 1993). In this context, this study also examines the performance of urban and rural informal sector firms and analyses the differential in their performance over the period from 1996 to 2011, which encompasses significant events such as the vigorous implementation of liberalisation programmes[3] and the Maoist insurgency[4].

3 Definition and Data Sources

For the purpose of this study, an informal sector enterprise is defined as a private unincorporated enterprise engaged in non-agricultural activities (including secondary non-agricultural activities within the agricultural sector), selling a portion of the goods or services produced, and employing less than 10 workers,[5] including both paid employees and contributing family members (Hussmanns 2004). Following the work of Bhattacharya and Kesar (2018) and Kesar and Bhattacharya (2019), the informal sector is further classified into two types: (i) Own Account Enterprises (OAEs) (the traditional segment) which rely solely on contributing household members and do not hire paid labour, and (ii) establishments (the modern segment) that

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[2] It is to be noted that the distinction between capitalist and non-capitalist enterprises, based on the presence of capital-wage relation, is an approximate categorisation performed for the purpose of this study, and is not a perfect distinction.

[3] IMF's macroeconomic stabilisation and structural adjustment programmes were conducted in Nepal in two phases, each in 1986–87 and 1989–90, which were more vigorously implemented in the 1990s when the multiparty system was reinstated (Pandey 2011).

[4] It is noteworthy that the conflict inflicted its greatest impact on rural and less-developed areas, particularly the mid-west and far-west regions.

[5] The use of less than 10 employees as a threshold for the size of informal sector enterprises is in accordance with the criteria used by national labour force surveys in determining employment in informal sector in Nepal.

employ at least one hired worker in addition to the contributing family members. Following the recent strand of literature discussed in the previous section (Bhattacharya, Bhattacharya & Sanyal 2013; Bhattacharya 2017; Bhattacharya & Kesar 2018; Kesar & Bhattacharya 2019), the distinction between OAEs and establishments is labelled in terms of production/labour processes: OAEs represent 'non-capitalist' enterprises engaged in petty commodity production solely through household labour without any capital-wage relationship, while establishments represent 'capitalist' enterprises that incorporate a capital-wage relationship in production alongside household labour.

We use datasets from Nepal Living Standard Survey (NLSS), a nation-wide multi-topic household survey conducted by the Central Bureau of Statistics for the purpose of our study. It is to be noted that data from household survey would not be wholly representative of firms; however NLSS is used as a better source of data on key variables of our interest, compared to other data sources including the available enterprise surveys.[6] In addition, the selection of time frame for the study (1995/96 to 2010/11) is also in response to the constraint posed by the availability of data since NLSS surveys were not conducted prior to 1995/96 and the third round (NLSS 2010/11) is the latest round of NLSS. We use data from three rounds of NLSS (NLSS 1995/96, NLSS 2003/04, and NLSS 2010/11) for the study. Enterprises run by self-employed individuals from cross-section sample households of the three rounds of NLSS are screened for if they have less than 10 workers. Such firms with less than 10 workers are chosen as informal sector firms for the purpose of the study. GDP deflator with base year 2011 is used to convert all monetary variables into real terms.[7]

4 Performance Trend and Dualism

In this section, we study the performance of informal sector in aggregate over time and further analyse heterogeneity within the sector using descriptive statistics and regression exercises. We, for the purpose of conducting descriptive analysis in this study, use median values rather than the commonly used mean values, as a measure of central tendency. The choice of median over mean is motivated by the significant standard deviation accompanying mean values, which arises due to the underlying heterogeneity within the informal sector. During the study period, informal sector firms saw their median net revenue[8] increase by only 7.34% (refer to Fig. 1). The performance trend reveals a dip in 2003/04, followed by a recovery in 2010/11. However, the subsequent 'bouncing back' resulted in a performance level only

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[6] Informal Survey, conducted by the World Bank in 2009, is an exclusive survey on informal sector enterprises. The dataset from the survey, however, is not used in this study primarily because it is not geographically representative (sample includes 120 enterprises spread across 12 towns with almost half of the sample located in the Kathmandu valley).

[7] The value of GDP deflator for the year is taken from the database of World Bank (2020).

[8] Net revenue is calculated as gross revenue obtained from sales minus direct input cost and indirect operational cost. Imputation for the wages of contributing household laborers is not done.
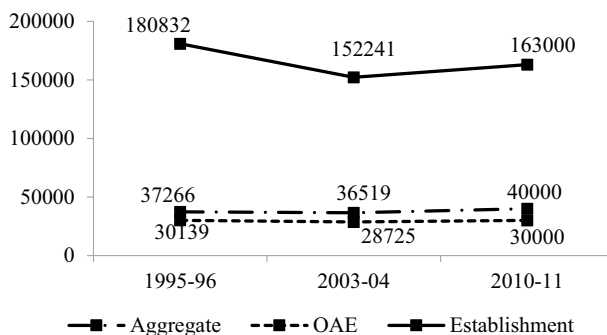
Fig. 1 Median net revenue of OAEs and establishments in informal sector (real annual values in NPR). The median net revenue difference between OAEs and establishments in each year is significant at 1%. *Source*: Author's construct based on calculation from NLSS datasets 1995/96, 2003/04, and 2010/11

Table 1 Proportion of OAEs and establishments in sample data (%)

Type of enterprise	1995/96	2003/04	2010/11
OAE	87.10	85.50	84.34
Establishment	12.90	14.50	15.66

Source: Author's calculation based on NLSS datasets 1995/96, 2003/04 and 2010/11

slightly better than that observed in 1995/96 (NPR 37,266 in 1995/96 compared to NPR 40,000 in 2010/11).[9]

We next examine the dynamics within the informal sector by categorising the sample enterprises into two groups: the 'traditional' OAEs and the 'modern' establishments, as defined in Section 3. Our analysis reveals that neither the OAEs nor the establishments showed any improvement in their median net revenue over the study period, as depicted in Fig. 1. Additionally, the performance of OAEs consistently lagged behind that of establishments in each survey year. The median net revenue of OAEs, as a proportion of establishments, ranged between 17% and 19%. This statistically significant performance differential between OAEs and establishments remained relatively constant over time, as shown in Fig. 1. Nevertheless, the informal sector continued to be predominantly dominated by OAEs, as indicated by the sample data that more than 84% of the enterprises (refer to Table 1) belonged to the category of OAEs in each survey year.

Our descriptive analyses revealed two important findings regarding the performance of the informal sector: first, there was only a marginal improvement over time in the median performance of firms, and second, a large performance gap persisted between OAEs and establishments, that did not show any significant decline over time, indicating persistent duality within the sector. These findings will now be

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[9] Exchange rate as on 1 January, 2011: 1 Nepali Rupee (NPR) = 0.0140 USD.

further elucidated through a detailed econometric analysis controlling for enterprise-specific and enterprise-head specific characteristics.

4.1 Model Specification and Results

We employ an OLS regression of independently pooled cross sections of enterprises over three rounds of NLSS (NLSS 1995/96, NLSS 2003/04, and NLSS 2010/11) to study the performance of firms in informal sector over time in terms of net revenue alongside different enterprise characteristics. In addition, we capture through this exercise the performance of OAEs vis-à-vis establishments over time.

The regression equations to be estimated are given below,

$$Ln\left(Netrevenue_{it}\right) = \alpha + \beta Enterprisetype_{it} + \gamma X_{it} + \delta Year_t + \varepsilon_{it} \qquad (1)$$

$$Ln(Netrevenue_{it}) = \alpha\prime + \beta\prime Enterprisetype_{it} + \theta Enterpisetype_{it} * Year_t + \gamma\prime X_{it} + \delta\prime Year_t + \varepsilon_{it}\prime$$
$$(2)$$

where for i = 1, 2, 3, …., n number of firms and t = 1995/96, 2003/04, and 2010/11 years, 'Enterprise type' is a dummy variable which takes value of 0 for an OAE and 1 for an establishment; '**X**' represents a vector of enterprise-head characteristics and enterprise characteristics as control variables; and '**Year'** is a time dummy with 1995/96 as the base year. Enterprise-head characteristics in the regression include education, gender, and caste of the enterprise-head. The enterprise characteristics considered here include place of operation (inside or outside household), borrowing (successfully borrowed or not), region (rural or urban), registration (registered or not), linkage (serving other individuals/households or enterprises as primary customers), age of the enterprise, duration of operation in a year (perennial or not), and industry-type.

Specification 1 studies the performance (in terms of net revenue) of overall informal sector enterprises over time and also shows the performance gap between OAEs and establishments in aggregate; however, it says nothing about the performance gap between OAEs and establishments over time. Specification 2 overcomes this limitation by introducing the time interaction dummies (through the interaction of enterprise-type and year dummies) to compare the performance gap over time between establishments and OAEs, which would help to explain whether dualism within the informal sector is persistent or withering away. Meanwhile, it is to be noted that the enterprise-type dummy in specification 2 has a different meaning compared to that in specification 1. The enterprise-type dummy in specification 2 shows the performance gap between establishments and OAEs in 1995/96 while in specification 1, it compares the performance of establishments with that of OAEs on aggregate. Now, the additional dummies used in specification 2, called the time interaction dummies (as stated earlier), indicate how much the difference between OAEs and establishments changed over the years compared to the difference between the two in 1995/96 (as shown by the enterprise-type dummy in specification 2)—a tentative measure of duality.

Table 2 Pooled OLS regression – Model specification 1

Independent variables	Dependent variable: Log of net revenue
Establishment (Base: OAE)	0.8719***
	(0.0525)
Time dummy (Base: 1995/96)	
Time dummy 2003/04	− 0.2571***
	(0.0564)
Time dummy 2010/11	− 0.2126***
	(0.0533)
Education of head (Base: No formal schooling)	
< = Secondary	0.3809***
	(0.0456)
> Secondary	0.5337***
	(0.0808)
Female head (Base: Male)	− 0.5353***
	(0.0538)
Caste (Base: Newar)	
Brahmin/Chhetri	− 0.2100***
	(0.0705)
Dalit	− 0.3321***
	(0.0824)
Janajati and others	− 0.2034***
	(0.06729)
Operation outside household (Base: Inside household)	0.3594***
	(0.0403)
Borrowed (Base: Not borrowed)	0.3354***
	(0.0440)
Urban (Base: Rural)	0.5711***
	(0.0429)
Registration (Base: Not registered)	0.5002***
	(0.0524)
Primary customers: Enterprises (Base: Other individuals/households as primary customers)	0.2365***
	(0.0572)
Ln (Age of enterprise)	0.0923***
	(0.0185)
Perennial operation (Base: Non-perennial)	0.9184***
	(0.0435)
Industry type (Base: Manufacturing/Mining/Utility/Construction)	
Agriculture, forestry and fishing	0.3009***
	(0.0726)
Trade/Transport/Finance/Services	0.3884***
	(0.0449)
Intercept	8.9659***
	(0.1014)
Adjusted R^2	0.4463
Observations	4614

Table 2 (continued)

Figures in parentheses are robust standard errors. *, **, and *** indicate significance at 10% , 5%, and 1% respectively

37 observations, being outliers, were not considered for regression. Further, the sample was truncated by 100 observations while taking the logarithmic value of net revenue because of zero, negative, or missing value of net revenue. This also holds for other regressions performed in this study using net revenue function

The industry dummy 'agriculture, forestry and fishing' used for regressions in this study includes only secondary non-agricultural activities in agricultural sector

Source: Author's calculation based on NLSS datasets 1995/96, 2003/04, and 2010/11

A striking finding from the estimation of model specification 1 (results are presented in Table 2) is that enterprises performed worse in terms of net revenue in 2003/04 and 2010/11 compared to 1995/96. The performance is the worst in 2003/04 with some recovery in 2010/11; nevertheless, the net revenue in 2010/11 is still lower than that in 1995/96. The descriptive analysis (discussed in Section 4 beginning), however, had showed a slight improvement over time, with a 7.34% increase in median net revenue in 2010/11 compared to 1995/96. Some difference has been observed between the descriptive statistics and regression results. This is because descriptive statistics are obtained without controlling for other characteristics of enterprise and enterprise-head, while such factors are controlled for in the regression.

An analysis of net revenue alongside firm and enterprises-head characteristics yields valuable insights on its possible correlates (refer to Table 2 for results). Enterprises led by individuals with secondary-level education or less exhibited a 38.09% higher net revenue compared to those led by individuals with no formal schooling. Similarly, woman-led enterprises displayed lower net revenue, with a 53.53% decrease compared to man-led enterprises.

The results indicate that the caste to which the enterprise-heads belong is an important determinant of enterprise performance. In Nepal, however, the caste stratification deviates from the traditional four *varna* system of the Vedic model. One of the purposes of Nepal's caste classification was to assimilate various indigenous and tribal groups into the hierarchical structure, as part of the process of Hinduisation (Bista 1991; Gurung 2003). To simplify the analysis, the enterprise-heads in this study are categorised into Brahmin/Chhetri, Newar, Janajati and others, and Dalit groups, reflecting the hierarchical range from "pure" to "impure" (based on Lynn, Dahal & Govindasamy 2008). Contrary to expectations, the results indicate that adherence to the traditional caste hierarchy does not necessarily lead to the anticipated hierarchical outcomes in terms of enterprise performance. The coefficients of the 'Brahmin/Chhetri', 'Dalit', and 'Janajati and others' categories are negatively significant compared to the 'Newar' group. The enterprises led by both the Brahmin/Chhetri and 'Janajati and others' had around 21% lower net revenue compared to the Newar-led enterprises. The Newar, an indigenous group that historically engaged in trade with Tibet, have managed to maintain economic and administrative power in the country despite attempts by the state to promote a mono-ethnic identity based on Brahmin-Chhetri culture

(Höfer 2004). They have utilised informal institutions, including ethnic clustering, to secure business niches despite bias from the state (Shakya 2018). On the other extreme, Dalit-led enterprises exhibited the poorest performance, with a 33.21% lower net revenue compared to Newar-led enterprises. The Dalits, positioned at the bottom of the caste hierarchy, have been unable to develop entrepreneurship due to limited access to land, capital, and education. It is noteworthy that only 10.7% of Dalits are literate, and a significant portion of the country's 2.5 million landless individuals belong to the Dalit community (Aahuti 2010).

Additionally, it was observed that enterprises located in urban areas exhibited a 57.11% higher net revenue compared to those in rural areas. The study also found that enterprise performance was positively influenced by factors such as registration status, successful borrowings in the previous year, primarily serving other businesses rather than households or individuals, and operating outside the household location. Within the informal sector, industry groups categorised as 'trade, transport, finance, and services' and 'agriculture, forestry, and fishing' outperformed the industry group categorised as 'manufacturing, mining, utility, and construction'.

As stated in the beginning of the Section 4.1, specification 1 does not allow for studying the trend of performance gap between OAEs and establishments, and time interaction dummies (interacting enterprise-type and time) have been introduced in specification 2 to investigate the development of duality within the informal sector over time. We have also already discussed the interpretations of 'enterprise-type dummy' and 'time interaction dummies' in the case of specification 2. The results from specification 2 (refer to Table 3) reveal a significant performance gap between establishments and OAEs, with establishments in 1995/96 exhibiting a net revenue higher than that of OAEs in the same year by 78.94% (as shown by the enterprise-type dummy). Now, a crucial finding with implications for understanding duality in the informal sector is the insignificance of the coefficients of the interaction terms. The insignificance of the coefficients of time interaction dummies suggests that the performance gap between OAEs and establishments did not significantly change between 1995/96 and 2010/11. In other words, if establishments performed better than OAEs in 1995/96, which certainly is the case as indicated by a positive and significant coefficient of the enterprise-type dummy variable (establishments in 1995/96 had higher net revenue compared to OAEs in the same year by 78.94%), they continue to be as better off in the subsequent time points in 2003/04 and 2010/11. The results from the regression based on specification 2 demonstrate a consistent non-decreasing performance gap (in terms of net revenue) between establishments and OAEs over the fifteen-year period, indicating persistent dualism. Similar performance gap between OAEs and establishments was also observed in Fig. 1, based on descriptive statistics.

Through the pooled OLS regressions, we therefore find: first, enterprises in the informal sector exhibited a decline in performance over the period from 1995/96 to 2010/11 after controlling for differences in their characteristics; second, establishments consistently outperformed OAEs, displaying significantly higher net revenue; and third, there was no sign of convergence between OAEs and establishments

Table 3 Pooled OLS Regression (Model specification 2)

Independent variables	Dependent variable: Log of net revenue
Establishment (Base: OAE)	0.7894*** (0.1117)
Establishment*Time 2003/04	0.1734 (0.1343)
Establishment*Time 2010/11	0.0627 (0.1256)
Time dummy (Base: 1995/96)	
Time dummy 2003/04	−0.2800*** (0.0622)
Time dummy 2010/11	−0.2196*** (0.0587)
Education of head (Base: No formal schooling)	
< = Secondary	0.3801*** (0.0456)
> Secondary	0.5329*** (0.0807)
Female head (Base: Male)	−0.5349*** (0.0539)
Caste (Base: Newar)	
Brahmin/Chhetri	−0.2103*** (0.0705)
Dalit	−0.3313*** (0.0825)
Janajati and others	−0.2024*** (0.0673)
Operation outside household (Base: Inside household)	0.3602*** (0.0403)
Borrowed (Base: Not borrowed)	0.3363*** (0.0440)
Urban (Base: Rural)	0.5708*** (0.0430)
Registration (Base: Not registered)	0.5012*** (0.0524)
Primary customers: Enterprises (Base: Other individuals/households as primary customers)	0.2365*** (0.0573)
Ln (Age of enterprise)	0.0926*** (0.0185)
Perennial operation (Base: Non-perennial)	0.9175*** (0.0435)
Industry type (Base: Manufacturing/Mining/Utility/Construction)	
Agriculture, forestry and fishing	0.3023*** (0.0727)
Trade/Transport/Finance/Services	0.3891*** (0.0449)

Table 3 (continued)

Independent variables	Dependent variable: Log of net revenue
Intercept	8.9747*** (0.1017)
Adjusted R^2	0.4462
Observations	4614

Figures in parentheses are robust standard errors

*, **, and *** indicate significance at 10%, 5%, and 1% respectively

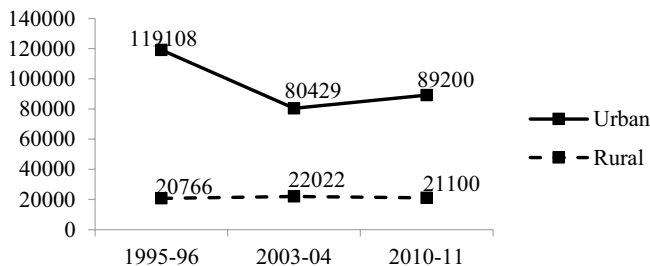*Source*: Author's calculation based on NLSS datasets 1995/96, 2003/04, and 2010/11

Fig. 2 Median net revenue of rural and urban firms across time (real annual values in NPR). The median net revenue difference between OAEs and establishments in each year is significant at 1%. *Source*: Author's construct based on NLSS datasets 1995/96, 2003/04, and 2010/11

in terms of net revenues, indicating the persistence of duality within the informal sector.[10]

5 Rural-Urban Divide in Enterprise Performance

In Section 4, it was demonstrated that urban enterprises had on average a net income that was 57.11% higher compared to their rural counterparts. In this section, we will focus on the performance of informal sector firms in urban and rural areas over time. Our objective is to analyse the disparities in their performance over time and determine whether these differences can be attributed to enterprise-specific characteristics or other factors. To conduct a spatial analysis, we have divided the sample into rural and urban enterprises. The majority of the sample enterprises are located in rural areas although this proportion is observed to have slightly declined over time (64% in 1995/96, 57% in

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[10] We also performed separate regressions (not presented here), similar to model specifications (1) and (2), taking average labour productivity (gross value added per person) function. We obtained results similar to the ones observed in case of specifications (1) and (2), except that we found the interaction term for the year 2003/2004 positive and significant at 10%, implying an increase in duality during the period (1995/96 to 2003/04).

2003/04, and 58% in 2010/11). Descriptive analysis (refer to Fig. 2) reveals a significant performance gap in each survey year between urban and rural enterprises in terms of their median net revenues. The median net revenue of rural enterprises each year was at best approximately one fourth of that of urban enterprises (see Fig. 2).

In order to provide a more precise analysis of the performance disparity between urban and rural enterprises in Nepal's informal sector from 1995/96 to 2010/11, we supplement the descriptive analysis with regression exercises taking the net revenue function. Our regression analyses are structured in two steps: First, we conduct separate OLS regressions for each year (1995/96, 2003/04, and 2010/11) using the net revenue function and including the 'urban' dummy variable as one of the determinants. The 'urban' dummy variable serves to indicate the performance disparity between rural and urban enterprises over time. Second, after obtaining information on the overall trend of the rural-urban divide, we delve deeper into the study by employing Blinder-Oaxaca (B-O) decomposition exercises on the cross-section data for each year. This decomposition exercise validates the trend identified by the 'urban' dummy variable in the regression analysis mentioned earlier. Furthermore, it provides insights into the factors contributing to the performance differential between rural and urban enterprises.

5.1 OLS Regressions

We estimate net revenue functions using the cross-section data for each of the three time periods separately through the following model specification.

$$Ln\big(Netrevenue_i\big) = \alpha + \gamma X_i + \eta Urban_i + \varepsilon_i \tag{3}$$

where $i = 1, 2, 3, \ldots, n$ number of firms, $\mathbf{X}$ represents a vector of enterprise characteristics, and 'urban' is a dummy variable that takes a value of 1 if the enterprise is located in urban areas and 0 if the enterprise is located in rural areas. The results (refer to Table 4) show that the coefficient of the 'urban' dummy remained positive and significant in all three time points. In 1995/96, net revenue of urban enterprises was higher than that of rural enterprises by 73.28%. This difference got significantly reduced to 46.62% in 2003/2004 and to 48.62% in 2010/11 compared to 1995/96. It is evident that the rural-urban performance differential got significantly reduced between 1995/96 and 2010/11.

5.2 Decomposition Exercise

We employ a twofold B-O decomposition to analyse the extent to which the disparity in net revenue between rural and urban enterprises can be attributed to their enterprise characteristics and other factors. The B-O decomposition is performed using the following linear regression model.

$$Y_j = X_j{'}\beta_j + \varepsilon_j, E\big(\varepsilon_j\big) = 0 \qquad j \in (R, U) \tag{4}$$

where Y is the log of net revenue, $\mathbf{X}$ is a vector of enterprise characteristics and a constant, β contains the slope parameters and the intercept, and ε is the error. R

Table 4 OLS Regressions: Net revenue of rural and urban firms (Year 1995/96, 2003/04, and 2010/11)

Variables	Dependent variable: Log of net revenue		
	1995/96	2003/04	2010/11
Ln (Enterprise size) (where, enterprise size = number of workers)	0.6779*** (0.0944)	0.7306*** (0.0686)	0.6399*** (0.0464)
Education of head (Base: No formal schooling)			
< = Secondary	0.3574*** (0.1004)	0.4998*** (0.0872)	0.3692*** (0.0593)
> Secondary	0.3182 (0.2187)	0.8829*** (0.1432)	0.5951*** (0.0961)
Female head (Base: Male)	− 0.7557*** (0.1947)	− 0.3632*** (0.0995)	− 0.3879*** (0.0615)
Caste (Base: Newar)			
Brahmin/Chhetri	− 0.0390 (0.2066)	− 0.0543 (0.1436)	− 0.2483*** (0.0797)
Dalit	− 0.1191 (0.1850)	− 0.2351 (0.1677)	− 0.2996*** (0.1038)
Janajati and others	− 0.0268 (0.1619)	− 0.1395 (0.1505)	− 0.1847** (0.0767)
Operation outside household (Base: Inside household)	0.4904*** (0.0933)	0.3643*** (0.0762)	0.5787*** (0.0531)
Borrowed (Base: Not borrowed)	0.1597* (0.0954)	0.2047** (0.0866)	0.2900*** (0.0604)
Urban (Base: Rural)	0.7328*** (0.0992)	0.4662*** (0.0841)	0.4862*** (0.0565)
Registration (Base: Not registered)	0.3741*** (0.1338)	0.4387*** (0.0835)	0.6396*** (0.0658)
Primary customers: Enterprises (Base: Other individuals/ households as primary customers)	0.3159** (0.1289)	0.1406 (0.1194)	0.2789*** (0.0756)
Ln (Age of enterprise)	0.0600 (0.0425)	0.1245*** (0.0340)	0.0895*** (0.0247)
Perennial operation (Base: Non-perennial)	0.8360*** (0.1011)	0.7883*** (0.0813)	0.7893*** (0.0615)
Industry type (Base: Manufacturing/Mining/Utility/Construction)			
Agriculture, forestry and fishing	− 0.1567 (0.2284)	0.0437 (0.1287)	0.2936*** (0.0921)
Trade/Transport/Finance/Services	0.3261*** (0.1159)	0.2357*** (0.0813)	0.3556*** (0.0596)
Intercept	8.7648*** (0.2670)	8.5081*** (0.2197)	8.5191*** (0.1229)
Adjusted R^2	0.4508	0.4305	0.4846
Observations	905	1291	2418

*, **, and *** indicate significance at 10%, 5%, and 1% respectively. Figures in parentheses are robust standard errors

Source: Author's calculation based on NLSS datasets 1995/96, 2003/04 and 2010/11

and U represent the rural and urban enterprises respectively. With some arithmetic manipulation, mean difference of log of net revenue of urban and rural enterprises can be represented as

$$R = [E(X\_U) - E(X\_R)]\prime\beta\_R + E(X\_U)\prime(\beta\_U - \beta\_R) \tag{5}$$

This is a two-fold decomposition, wherein the difference in the log of net revenue between rural and urban enterprises is divided into two components: (i) the portion attributed to differences in the enterprise characteristics of rural and urban enterprises, referred to as the 'endowment' or 'explained' component, and (ii) the portion resulting from differential effects of these characteristics on the log of net revenue of rural and urban enterprises, referred to as the 'returns to the endowment' or 'unexplained' component. The 'unexplained' component is usually attributed to discrimination, but it is important to recognise that it also captures all potential effects of differences in unobserved variables. The decomposition shown in Eq. (5) is formulated from the viewpoint of rural enterprises. That is, the endowment or explained component measures the expected change in the mean net revenue of rural enterprises if they had the predictor levels of urban enterprises. Similarly, the unexplained component measures the expected change in the mean net revenue of rural enterprises if they had the coefficients of urban enterprise, along with the potential effects of difference in unobserved variables.

The results obtained from the B-O decomposition exercises conducted for each year (see Fig. 3; refer to Tables 5, 6 and 7 for detailed decomposition results) align with the previous findings derived from the comparison of the coefficients of 'urban' dummy in model specification 3 (refer to Table 4) — the gap between urban and rural enterprises significantly lessened between 1995/96 and 2003/04, but experienced a slight increase between 2003/04 and 2010/11. The mean log (net revenue) differences between urban and rural enterprises in 1995/96, 2003/04, and 2010/11 were recorded as 1.5636,
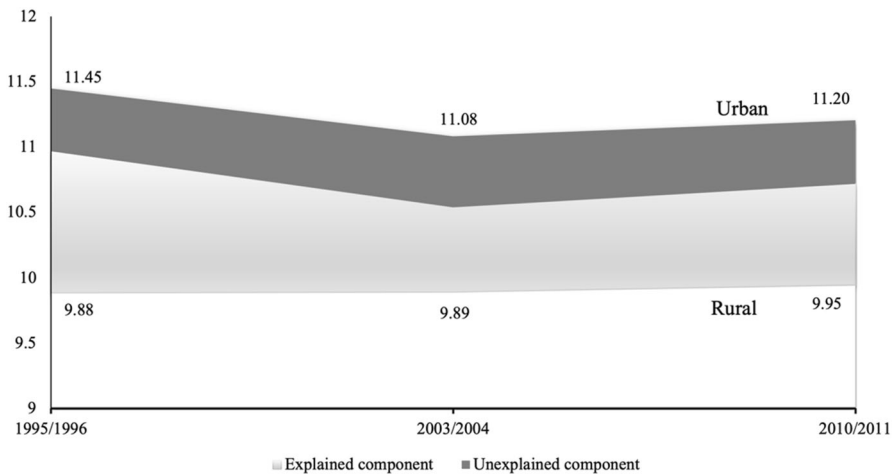

Fig. 3 Plot of predicted mean net revenue difference between urban and rural enterprises across time along with the contributions of the 'explained' and 'unexplained' components. *Source*: Author's construct based on the results of Blinder-Oaxaca decomposition exercises

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1.1910, and 1.2577 respectively with urban enterprises exhibiting higher mean predictions (refer to Fig. 3). More than 50% of this difference in each year can be attributed to the 'explained' component, also known as the 'endowment effect' (refer to Fig. 3). Throughout all three years, urban firms consistently possessed 'favourable' enterprise characteristics such as larger enterprise size, registration status, perennial operation, non-household operations, and enterprise heads with higher education levels, which accounted for their higher net revenue compared to rural enterprises.

However, except for registration, very few enterprise characteristics exhibited consistent and significant contributions to the 'unexplained' component across all three years (refer to Tables 5, 6 and 7). Registration consistently displayed a negative and significant 'unexplained' effect. The positive 'explained' effect and the negative 'unexplained' effect of registration can be interpreted as follows: if, on average, rural enterprises had the same level of registration (i.e., endowment) as urban enterprises, their net revenue would have been higher; conversely, the negative sign for the unexplained component suggests that if, on average, rural enterprises had similar returns from registration as urban enterprises, their net revenue would have been lower. Thus, rural enterprises derived greater benefits from registration compared to urban enterprises. The 'unexplained' part, however, needs to be interpreted with caution since it also includes the effect of unobserved characteristics, including enterprise-specific characteristics such as asset size and capital investment, which could not be included in the regressions due to data limitation. On the other hand, access to borrowing, and gender and caste of the enterprise head, could explain only little of the rural-urban differences in enterprise performance.

The comparison of predicted mean log (net revenue) values between urban and rural enterprises, obtained from the B–O decomposition (refer to Fig. 3), reveals a decline in the rural-urban disparity in enterprise performance during the period from 1995/96 to 2010/11. However, this decline can be attributed to the underperformance of urban enterprises rather than the improved performance of rural enterprises. By considering the results from descriptive analysis, year-by-year regressions, and B–O decomposition exercises, it can be argued that while the gap between rural and urban sectors in the informal sector narrowed between 1995/96 and 2010/11, it in linked to the underperformance of urban firms and the stagnant performance of rural firms over time. In essence, although the reduction in the rural-urban disparity may initially seem positive, it is primarily driven by the underperformance of urban firms rather than any substantial improvements in rural firms.[11]

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[11] We also performed separate OLS regressions using a pooled sample of rural and urban enterprises, employing the following model specification 6:

$$Ln\left(Netrevenue_{ijt}\right) = \alpha + \gamma X_{ijt} + Year_t + \varepsilon_{ijt} \qquad j \in (Rural, Urban) \qquad (6)$$

where i = 1,2, 3, …., n number of firms, t = 1995/96, 2003/04, and 2010/11 years, **X** represents a vector of enterprise characteristics, and 'year' is a time dummy variable with base year 1995/96. The results (refer to Table 8 in Appendix 2) are almost in coherence with the earlier findings from the B–O decomposition (refer to Fig. 3) and the descriptive analysis (refer to Fig. 2). The signs and coefficients of the 'year' dummy indicate that urban enterprises performed worse in 2003/04, with minimal recovery in 2010/11. However, unlike the results from B-O decomposition and descriptive analysis, which showed that rural enterprises more or less stagnated throughout the entire period, we here found that rural enterprises performed even worse over time. Nevertheless, it is important to note that the proportion of decline faced by urban enterprises was observed to be more than that experienced by rural enterprises.

6 Discussion

In our study, we observed a decline in the overall performance of the informal sector in real terms over a 15-year period from 1995/96 to 2010/11. Additionally, we identified a significant duality within the informal sector, with traditional/non-capitalist enterprises comprising the majority (over 80%) but performing poorly in comparison to modern/capitalist enterprises. The annual median net revenue of non-capitalist enterprises was only 17% to 19% of that of capitalist enterprises, indicating a persistent performance gap. Regarding the spatial dimension of our study, we found that the rural-urban gap in informal sector performance had reduced between 1995/96 and 2010/11. However, this reduction does not imply any improvement or 'catching-up' by rural firms. Instead, it is attributed to the underperformance of urban firms and the stagnation of rural firms over time. Despite the apparent bias towards urban development, the urban informal sector did not exhibit strong performance. These findings have important implications for the reproduction and upward mobility of informal sector firms.

The development literature extensively discusses the transformation of the informal economy, moving from the "traditional" to the "modern" sector, and the consequent dissolution of duality. One possible way for this structural change to occur in the informal sector is through the growth of smaller firms into larger ones, eventually transitioning into the formal sector. However, the dismal performance trend of the informal sector in aggregate, the operation of traditional informal sector firms at consistently low-income level, and a persistent performance gap between the modern/capitalist segment and the traditional/non-capitalist segment within the informal sector indicate that there have been minimal signs of any structural change in the informal sector between 1995/96 and 2010/11.

Another potential mechanism for the decline of duality within the informal sector is the exit of low-performing traditional/non-capitalist enterprises. These enterprises have a median real net revenue of only NPR 2,500 (USD 35) per month or NPR 30,000 (USD 420) per year (with base year 2011). However, the sample data reveals that the proportion of non-capitalist/own-account enterprises did not significantly decrease and remained at around 84% in 2010/11. This implies that the non-capitalist informal sector firms have just enough for them to economically reproduce, which explains the persistence, but are not able to grow in order for the structure of dualism to wither away.

This apparent contradiction – continued operation of non-capitalist enterprises despite low income – can be explained by conceptualising informal economy akin to a 'need' economy (Sanyal 2007). Unlike capitalist firms that aim for accumulation and expansion, non-capitalist firms primarily serve the purpose of acquiring commodities to meet the consumption needs of the household involved in production,

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while also replenishing their initial stock. Conversely, the continued persistence of non-capitalist enterprises in the face of meagre income suggests that ensuring the replenishment of the enterprises' initial capital stock may come at the cost of reduced consumption or increased labourious efforts. Furthermore, some literature (Bhattacharya, Bhattacharya, & Sanyal 2013; Bhattacharya 2014, Bhattacharya 2017) argue that the conditions of existence of informal sector firms at such low level of income are often facilitated by employing an alternate logic of production organisation – such as sharing dwelling units as production sites, utilising family labour, using household tools, and encroaching upon urban commons − aimed at pooling resources so as to lower input and operation costs. In conclusion, based on the findings of this study, policies should focus on creating favourable conditions for sustaining the informal sector and improving the well-being of informal sector workers.

Appendix 1

The detailed results of the twofold Blinder-Oaxaca (B-O) decomposition employed in Section 5.2 to analyse the extent of rural-urban disparity in enterprise performance are reported in Tables 5, 6 and 7.

Table 5 Blinder-Oaxaca decomposition of net revenue function of rural and urban firms (Year 1995/96)

Variables	Dependent variable: Log of net revenue		
	Differential	Explained component	Unexplained component
Ln (Enterprise size) (where, enterprise size = number of workers)		0.2931*** (0.0477)	−0.1406 (0.1423)
Education of head (Base: No formal schooling)			
< = Secondary		0.0214 (0.0133)	−0.1244 (0.1193)
> Secondary		0.1302*** (0.0409)	−0.1918* (0.1085)
Female head (Base: Male)		0.0175 (0.0161)	−0.1342 (0.1028)
Caste (Base: Newar)			
Brahmin/Chhetri		0.0028 (0.0091)	0.0744 (0.0964)
Dalit		0.0162 (0.0135)	0.0019 (0.0208)
Janajati and others		0.0562** (0.0266)	0.2036** (0.0975)
Operation outside household (Base: Inside household)		0.0570*** (0.0204)	−0.0276 (0.1045)
Borrowed (Base: Not borrowed)		−0.0043 (0.0050)	−0.0156 (0.0271)
Registration (Base: Not registered)		0.1890*** (0.0419)	−0.1934** (0.0751)
Perennial operation (Base: Non-perennial)		0.2429*** (0.0388)	−0.0029 (0.1845)
Industry type (Base: Manufacturing/Mining/Utility/Construction)			
Agriculture, forestry and fishing		−0.0008 (0.0048)	−0.0011 (0.0081)
Trade/Transport/Finance/Services		0.0613*** (0.0205)	−0.3306* (0.1904)
Intercept			1.3634*** (0.4858)
Total		1.0825*** (0.0938)	0.4811*** (0.1182)
Prediction of urban	11.4481*** (0.1051)		
Prediction of rural	9.8845*** (0.0580)		
Difference	1.5636*** (0.1200)		
Observations		905	905

*, **, and *** indicate significance at 10%, 5% , and 1% respectively. Figures in parentheses are robust standard errors

Source: Author's calculation based on NLSS dataset 1995/96

Table 6 Blinder-Oaxaca decomposition of net revenue function of rural and urban firms (Year 2003/04)

Variables	Dependent variable: log of net revenue		
	Differential	Explained component	Unexplained component
Ln (Enterprise size) (where, enterprise size = number of workers)		0.2369*** (0.0380)	-0.0532 (0.0887)
Education of head (Base: No formal schooling)			
< = Secondary		0.0465*** (0.0169)	0.0107 (0.0928)
> Secondary		0.0875** (0.0379)	0.0460 (0.0557)
Female head (Base: Male)		− 0.0226* (0.0126)	0.0215 (0.0441)
Caste (Base: Newar)			
Brahmin/Chhetri		0.0155 (0.0164)	− 0.1770* (0.0982)
Dalit		− 0.0094 (0.0248)	− 0.0331 (0.0347)
Janajati and others		− 0.0649 (0.0655)	− 0.2727** (0.1180)
Operation outside household (Base: Inside household)		0.0171* (0.0096)	0.1713* (0.0915)
Borrowed (Base: Not borrowed)		0.0032 (0.0069)	− 0.0471* (0.0286)
Registration (Base: Not registered)		0.1737*** (0.0346)	− 0.1677*** (0.0583)
Perennial operation (Base: Non-perennial)		0.1528*** (0.0281)	0.2219* (0.1249)
Industry type (Base: Manufacturing/Mining/Utility/Construction)			
Agriculture, forestry and fishing		− 0.0005 (0.0051)	0.0040 (0.0176)
Trade/Transport/Finance/Services		0.0122 (0.0084)	0.0372 (0.1096)
Intercept			0.8027* (0.4336)
Total		0.6479*** (0.0969)	0.5431*** (0.1170)
Prediction of urban	11.0821*** (0.0664)		
Prediction of rural	9.8911*** (0.0565)		
Difference	1.1910*** (0.0872)		
Observations		1291	1291

*, **, and *** indicate significance at 10%, 5% , and 1% respectively. Figures in parentheses are robust standard errors

Source: Author's calculation based on NLSS dataset 2003/04

Table 7 Blinder-Oaxaca decomposition of net revenue function of rural and urban firms (Year 2010/11)

Variables	Dependent variable: Log of net revenue		
	Differential	Explained component	Unexplained component
Ln (Enterprise size) (where, enterprise size = number of workers)		0.1042*** (0.0188)	0.0385 (0.0574)
Education of head (base: No formal schooling)			
< = Secondary		0.0101 (0.0074)	− 0.0490 (0.0648)
> Secondary		0.0695** (0.0275)	0.0145 (0.0429)
Female head (Base: Male)		0.0107 (0.0082)	− 0.0012 (0.0342)
Caste (Base: Newar)			
Brahmin/Chhetri		− 0.0032 (0.0068)	− 0.0845 (0.0610)
Dalit		0.0001 (0.0091)	− 0.0450** (0.0182)
Janajati and others		− 0.0023 (0.0280)	− 0.1255** (0.0631)
Operation outside household (Base: Inside household)		0.1074*** (0.0182)	− 0.0601 (0.0649)
Borrowed (Base: Not borrowed)		0.0120* (0.0062)	− 0.0194 (0.0274)
Registration (Base: Not registered)		0.2425*** (0.0348)	− 0.1545*** (0.0558)
Perennial operation (Base: non-perennial)		0.1833*** (0.0226)	− 0.1037 (0.1013)
Industry type (Base: Manufacturing/Mining/Utility/Construction)			
Agriculture, forestry and fishing		− 0.0167** (0.0074)	− 0.0079 (0.0123)
Trade/Transport/Finance/Services		0.0551*** (0.0182)	0.0775 (0.0851)
Intercept			1.0051*** (0.2446)
Total		0.7727*** (0.0630)	0.4850*** (0.0678)
Prediction of urban	11.2049*** (0.0459)		
Prediction of rural	9.9472*** (0.0425)		
Difference	1.2577*** (0.0625)		
Observations		2418	2418

*, **, and *** indicate significance at 10% percent, 5%, and 1% respectively. Figures in parentheses are robust standard errors

Source: Author's calculation based on NLSS datasets 2010/11

Appendix 2

The results of OLS regressions performed on net revenue functions using a pooled sample of rural and urban enterprises separately are reported in Table 8.

Table 8 Pooled OLS Regression-net revenue of rural and urban firms

Variables	Dependent variable: Log of net revenue	
	Urban	Rural
Ln (Enterprise size) (where, enterprise size=number of workers)	0.6591*** (0.0514)	0.6897*** (0.0497)
Time dummy (Base: 1995/96)		
Time dummy 2003/04	−0.3308*** (0.1079)	−0.2089*** (0.0635)
Time dummy 2010/11	−0.2682** (0.1058)	−0.2036*** (0.0570)
Education of head (Base: No formal schooling)		
< = Secondary	0.3319*** (0.0741)	0.4171*** (0.0549)
> Secondary	0.5698*** (0.1068)	0.6249*** (0.1207)
Female head (Base: Male)	−0.4695*** (0.0975)	−0.4404*** (0.0616)
Caste (Base: Newar)		
Brahmin/Chhetri	−0.2571*** (0.0890)	0.0489 (0.1394)
Dalit	−0.4492*** (0.1132)	0.0231 (0.1495)
Janajati and others	−0.2812*** (0.0768)	0.0930 (0.1373)
Operation outside household (Base: Inside household)	0.5447*** (0.0618)	0.4738*** (0.0515)
Borrowed (Base: Not borrowed)	0.1668** (0.0656)	0.3261*** (0.0617)
Registration (Base: Not registered)	0.3575*** (0.0629)	0.8403*** (0.0759)
Primary customers: Enterprises (Base: Other individuals/households as primary customers)	0.3493*** (0.0875)	0.2133*** (0.0757)
Ln (Age of enterprise)	0.1264*** (0.0318)	0.0789*** (0.0222)
Perennial operation (Base: Non-perennial)	0.7627*** (0.0777)	0.7945*** (0.0524)
Industry type (Base: Manufacturing/Mining/Utility/Construction)		
Agriculture, forestry and fishing	0.1258 (0.1266)	0.2293*** (0.0858)
Trade/Transport/Finance/Services	0.3426*** (0.0712)	0.3031*** (0.0549)
Intercept	9.4849*** (0.1702)	8.4900*** (0.1600)
Adjusted R^2	0.3722	0.3759
Observations	1887	2727

*, **, and *** indicate significance at 10%, 5%, and 1% respectively. Figures in parentheses are robust standard errors

Source: Author's calculation based on NLSS datasets 1995/96, 2003/04, and 2010/11

Data availability The data sets supporting the results or analyses presented in the paper are available on purchase from the Central Bureau of Statistics, Government of Nepal. The data sets are not available on open access. The Stata software was used for data analysis. The do-file and the log-file executed using the software can be made available on demand from the editor or reviewer(s).

Declarations

Conflict of interest The author declares no potential conflict of interest with respect to the research and authorship of this article.

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