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## **The Effects of Cameroonian Informal Sector on the Scale and Composition of Output**

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# **The Effects of Cameroonian Informal Sector on the Scale and Composition of Output**

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**Abstract:** This paper studies potential economic effect of the informal sector, stemming from two factors: first, that informal workers, rural migrants, bring not only their labour supply with them, but also their consumption demands. Second, that informal workers may have a comparative advantage in the production of local goods. The paper then provides some descriptive statistics on the Informal workers share in the Cameroonian labour force, by industry, region, as well as on their branches distribution. Using data on a sample of micro-enterprises located in Douala and Yaoundé between 2001 and 2010 matched with Rural and Urban Youth Support Program (RUYSP) and the National Employment Fund (NEF) data, the paper find some evidence that rural workers inflows boost employment in the retail sector, which is non-traded and a non-intensive user of informal labour. The paper also find that informalisation is associated with greater stand-alone retail stores, and a fewer number of large and in particular big-box retailers – evidence that likely corroborate a diversity-enhancing effect of informalisation. Finally, focusing more sharply on the agricultural sector, for which we can better identify the types of products consumed by customers, the authors indicate that informalisation is associated with increased product diversity of agricultural sellers.

**Keywords:** Informal sector, labour supply, demand, product diversity.

**JEL Classification:** J2, E26, O17, D51, R32.

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## 1. Introduction

The informal modern sector is often a dynamic actor in the process of economic development, frequently outpacing the growth of the formal modern sector (Van Der Hoeven, 2010). The informal sector is difficult to quantify (Hart, 1971), but this sector plays in both developed and developing countries a vital role: it is estimated to contribute between 16 and 75 % of the GDP many nations (Amini, 2004). In many developing countries over 70 % of the working age population is employed in the informal sector of the economy. Moreover, the informal sector represents a parallel economy that is directly affected by conditions within the formal economy (Coate, Handmer and Choong, 2006). Contemporaneous with the remarkable surge in informalisation, there has arisen a controversial debate on the economic consequences of the informal sector – in large part focused on whether informal employees increase scale or influence the composition of output (Golub, Bernhardt and Liu, 2011).

The share of informal workers in the Cameroonian labour force increased from 10 % in 1980 to 14 % in 2007. Cameroonian employment consequently remains overwhelmingly informal. Contemporaneous with the remarkable surge in informalisation, there has arisen a controversial debate on the economic consequences of informalisation – in large part focused on whether informal workers compete with formal workers for jobs and hence reduce wages for formal workers (Rani, 2008). Economic theory can be readily used to justify concerns over the effects of informal workers inflows on outcomes for formal workers who can compete for similar jobs with informal workers. However, what is often ignored in both research and the policy debate is that informal workers do not bring to the economy only their labour supply, but also their consumption demands. Given that informalisation induces both supply and demand shifts, an exclusive focus on labour supply shifts and the induced competition with formal workers is too narrow and likely to overstate the negative effects of informalisation. In this paper we focus on two dimensions of the economics of informalisation that have received scant attention.

First, we focus on the consumption demands that accompany the labour supply shifts induced by informalisation. The proportion of goods and services consumed by informal workers might be too small to affect the product demand curve for some formal-traded goods; and goods that are traded domestically may also be traded internationally, so it is not clear that informalisation necessarily shifts out by increasing the demand for these goods. However, many goods and especially services are produced and consumed locally (“non-traded”

internationally), so that informal workers influxes in an informal economy can significantly shift the demand for these non-traded internationally goods and services, thus contributing to informal job creation. These effects aggregate up, so that informalisation should lead to employment increases in industries that produce such goods and services, thus offsetting, at least in part, the labour supply shifts caused by informalisation. We refer to these as the “scale” effects of informalisation. One goal of our paper is to identify and estimate these types of scale effects associated with informalisation.

Second, because informal workers are consumers with potentially different demand characteristics and also may have a comparative advantage in the production of “local” goods, their arrival may not only increase aggregate demand, but may also change the composition of products available to consumers. This effect may occur as a result of both output demand and labour supply shifts. For example, to the extent that informal workers have higher price elasticities of demand and/or less attachment to brands, they may increase demand for retail services from little shop or small retail spaces. On the other hand, because of the differentiated variety of products that informal workers consume and provide, the presence of migrant informal workers may increase the diversity of consumption choices available to urban individuals in non-tradable good, such as farming seller, retail trade, and entertainment. Our research also attempts to quantify some of these “composition/variety” effects – which have been often mentioned in the informalisation literature but hardly ever modelled or measured.

To investigate both the scale and composition effects of informalisation on output, we use data from the Cameroonian National Household Surveys (CNHS) database matched with the Rural and Urban Youth Support Program (RUYSP) and the National Employment Fund (NEF). The CNHS covers essentially informal workers and enterprises, and provides detailed information on both geographical location and industry. Many informal sector enterprises are hard to identify and locate during a door to door enumeration because they lack recognisable business premises. Examples are activities conducted inside the owner’s home (e.g. tailoring, food processing) or without fixed location (e.g. construction, transport, and agricultural trade). We use CNHS data for Douala and Yaoundé concerning Littoral and Centre (economic and political) regions, mapping each business establishment in the CNHS into the two others database, and merging the CNHS with these data on the total and regional sample population residing in each block or tract. Rural migrants, added to the newly unemployed in the big urban areas Douala and Yaoundé, significantly increased the number of informal workers.

For example, in 2010, the two towns were home to one-third of all rural-born individuals living in Cameroon.

Our empirical evidence is based on the relationships between informal workers inflows into urban areas and a number of dimensions of change in the employment and composition of businesses in these urban areas. Our empirical analyses attempt to use these relationships to isolate evidence on the scale and composition effects of informalisation, and to rule out other explanations of the evidence.

The rest of the paper is organized as follows: Section 2 provides economics effect of informality and presentation of data. Section 3 focuses on the empirical results and economic implications, and conclusions are sketched in Section 4.

## **2. Economic Effects of Informality**

### **Informalisation induced labour supply shifts**

The traditional model of a competitive labour market predicts that, in the presence of a (fixed) downward-sloping labour demand curve, the shift in supply arising from rural informal workers influx should unambiguously lower the real wage of urban formal workers with whom informal workers directly compete (Harris and Todaro, 1970; Rozensweig, 1988; Fields, 1989). In addition, as long as the formal labour supply curve is upward sloping, informalisation should also reduce the amount of labour supplied by the formal workforce, given the formal sector wage rate. Numerous studies have tested these predictions by estimating reduced-form wage and employment equations for formal workers in a given skill group as a function of influxes of informal workers with the same level of skills (Agénor and Montiel, 1999; Gong, van Soest and Villagomez, 2004).

But the findings should be mixed, depending on the level of aggregation of the data used: panel analyses – which contrast the level or change in informalisation by country with the level or change in outcomes for formal workers – have found negative, but generally small, possibly insignificant effects (Johnson, Kaufmann and Zoido-Labatón, 1998; Friedman et al., 2000). Evidence based on cross-area variation, however, can be biased against finding a negative impact of informalisation on urban labour markets, because formal workers may respond to the wage and employment impact of informalisation on a local market by moving

their labour or capital elsewhere (Cogneau, Razafindrakoto and Roubaud, 1996). The labour discipline impact of informalisation results from the fluidity of movement by labour between formal and informal activities in or between countries. While there is no available evidence on capital adjustments to informalisation, the literature provides mixed findings on the displacement effects of informalisation on formal labour (Bayat, 2000; Kudva, 2005).

Cameroon like most of poor countries has severe problems in balancing labour supply and demand. Their labour force participation rates are lower and their unemployment rates higher than those of most countries outside the region (INS, 2006, 2011). This is no doubt true to a large extent, but the problem appears also and perhaps more so due to a major, structural, overall imbalance between the supply of jobseekers and limited formal sector labour demand (Komon and Tchakounté, 2008). Another process of adjustment to informalisation that has been investigated in the literature is the adoption of informal-low technologies, low skills and low productivity (Arellano, 1994; Barthélemy, 1998).

In addition, markets in developing countries are indeed characterized by the absence (or poor functioning) of institutions capable of processing and providing in timely manner relevant information on job opportunities to potential applicants – particularly those with low levels of qualifications (Agénor, Izquierdo and Jensen, 2007). As a result, low-skilled workers employed in the informal sector are unable to engage in on-the-job search, looking for a job in the formal sector for that category of workers often requires, literally speaking, waiting for employment offers at factory gates. Evidence of queuing by informal sector workers for formal sector jobs as hypothesized here has been provided by several authors (Cogneau, Razafindrakoto and Roubaud, 1996; Kelodjoue, 2005). Gong, Van Soest and Villagomez (2004), for instance, found evidence of significant entry barriers into the formal sector for workers with low levels of education.

The implications of imperfect labour mobility between the formal and informal sectors for the response of urban wages and employment to shocks can be illustrated with a simple, partial equilibrium analysis with homogeneous labour (Agénor and Montiel, 1999). The determination of wages and employment show that more workers would elect to seek employment in the informal sector, bidding wages there down. Employment therefore increases in the informal sector, whereas wages fall.

### **Informalisation induced demand shifts**

The focus on modelling informalisation exclusively as a shock to labour supply is overly narrow. Demand conditions determine how people split their income between formal and informal products, capital and labour. The informal economy is typically characterized by strong economic dynamism, rapid entry and exit and flexible adjustment to change in demand (Chen, 2012). However, if capital is mobile across sectors, the informal economy can benefit from increased demand for its goods and services and informal wages could rise.

In fact, informal are not only workers but also consumers of goods and services, so that informalisation will cause shifts in product demand. To the extent that the goods for which demand rises are produced and traded locally (as opposed to globally), product demand shifts have the potential to affect labour demand as well, and this will alleviate the adverse effects of informalisation on wages and employment (Tchakounté and Abdoul, 2015). There are very few attempts, however, to empirically identify the demand-side effects of informalisation – which requires the separation of informalisation-induced labour demand shifts from both: (i) informalisation-induced labour supply shifts, and (ii) labour demand shifts that predate informalisation.

Informal activities tend to reduce prices of consumption goods and therefore contribute to maintaining low wages. The firms operate in this sector are mass producers and usually set low prices, making their product affordable to the poor. Similarly, such firms operating in the informal economy are often small and face barriers to growth, preventing them from offering high-quality goods and services.

Firms with access to sufficient financial resources and good information about market prices and preferences should be able to reap the benefits of expanding domestic and export markets, and develop their activities (Marjit and Maiti, 2005). Other firms – generally of small or micro scales – have to rely on intermediaries to convey their products to the marketplace either because they lack accurate information about demand (quality, prices, etc.) or because they do not possess the necessary marketing channels to promote their products. Moreover, formal enterprises subcontract part of their activities to informal producers. In doing so, they gain some flexibility in the organization of production and avoid costs linked to the supervision of the production activity and to formalisation (constraints of labour legislation, administrative costs, etc.). Hence, with domestic and foreign markets growing, rural informal producers should become increasingly tied to middlemen and formal enterprises.

## **Product diversity and informalisation**

One of the commonly-cited benefits of informalisation is that the diversity of the population is enhanced. Although diversity is often touted as a benefit in and of itself, economic models can help explain why diversity might increase welfare (Castells and Portes, 1989). Informality has reached many levels of activity ranging from mid-size subcontracting firms to microenterprises, workshops, sweatshops, and home-based production. Alongside the processes of informalisation tied directly or indirectly to core production, developing countries have continued to experience the growth of subsistent activities generated by the inability of their economies to absorb the unemployed and underemployed (Cosar, Guner and Tybout, 2010). The result has been the tremendous heterogeneity of informal activities.

The informal sector is characterized by a large number of small-scale production and service activities that are individually or family-owned and use labour-intensive and simple technology (Todaro and Stephen, 2003). Such enterprises tend to be operated like monopolistically competitive firms with ease of entry, excess capacity, and competition driving profits (incomes) down to the average supply price of labour of potential new entrants. The usually self-employed workers in this sector have little formal education, are generally unskilled, and lack access to financial capital.

The informal sector plays an important role in recycling waste materials, engaging in the collection of goods ranging from scrap metals to cigarette butts, many of which find their way to the industrial sector or provide basic commodities for the poor (Pérez Sainz, 2005). As many members of the household as possible, including women and children, are involved in income-generating activities, and others are less fortunate. Many thousands are homeless, living on the pavements of Douala, Yaoundé, Bafoussam, Bamenda, Bertoua, Maroua, Garoua and many other Cameroonians cities (World Bank, 1995). They find sporadic, temporary employment in the informal sector as day labourers and as hawkers.

Therefore, it is not uncommon to find in many today developing countries that masses of poor peasant flee the rural areas and move to urban metropolises, entering informal labour markets and engaging in jobs like hawking small trinkets, taking photographs for tourists, prostitutions and other marginal occupations. Highly concentrated, these activities have environmental consequences, cause pollution and congestion (for example, pedicab or “benskind”) or inconvenience to pedestrians (hawkers and vendors).The informal sector is more likely to



adopt appropriate technologies and make use of local resources, allowing for an efficient allocation of resources.

### **Data and empirical strategies**

The analysis of informal employment and output in developing countries is a particularly difficult task. Cameroon is not an exception. It is largely due to problems associated with the different definitions of the concept, measurement and sector applied. Our major concern is the lack of comprehensive, detailed and accurate data on informal employment and composition of output.

Our dependent variables are constructed using data from the Cameroonian National Household Surveys (CNHS) conducted in Cameroon during the last decades. The CNHS project does not contain a rich set of information about each informal establishment, but was designed to provide a source of data on establishment or Informal Production Units (IPU) and households to be used in policy design, monitoring of living standards and evaluation of policies and programmes. The database includes the establishment location and employment (as well as sales, which we do not use because it is usually imputed). Some of the unit of observation in the CNHS is a business establishment, which is a business or industrial unit at a single physical location that produces or distributes goods or provides services – for example, a single store or factory.

Two surveys, conducted in 2001 and 2007, were “highly representative of Cameroonians households”. The questionnaire was pre-tested on its feasibility with regard to time, staff requirement and comprehensibility. The households are randomly divided into two sub-samples: (i) construction and calibration for selecting indicators and points and for associating scores with informal likelihoods; (ii) validation for measuring accuracy with data not used in construction or calibration. A multi-stage cluster sampling procedure was used for the sample design. In total, there were 10 992 households (more than 30 000 individuals) in the first survey in 2001 and 11 534 households (more than 40 000 individuals) in the second survey in 2007.

In 2010, the Government of Cameroon conducted another survey called second survey on employment and the informal sector in Cameroon (EESI 2). Different from the earlier two CNHS surveys, the 2010 EESI covered less wide samples. One small sample (8 160 households) concentrated on income of households to assess living standards at the national,

regional and department levels, with a greater number of 22 949 individuals was used to collect information on both income and expenditure to evaluate living standards at the central and regional levels. With the prime focus on informal sector and expenditure-based estimates of living standards, the 2010 EESI questionnaires were shortened and modules were simplified, with different definitions and questions from the two CNHS questionnaires in the 2001s. Although basic indicators in the 2010 EESI can still be compatible with the two previous surveys, the difference has created difficulties for comparisons across the surveys. Given this limitation, readers should interpret the results from the 2010 EESI with care. It is highly recommended that future surveys in Cameroon should be designed and carried out on the basis of the past and current surveys to produce comparable data and reliable information which can be used for policy, planning and research purposes.

In addition to the living standard survey data sets, the present report also employs youth data collected recently by the Rural and Urban Youth Support Program (RUYSP) and The National Employment Fund (NEF). The first national baseline survey of youth and youth issues, the largest and most comprehensive one undertaken in this project level, was undertaken by the Ministry of Youth Affairs in collaboration with several UN agencies and international organizations – funded mostly from the Heavily Indebted Poor Countries Initiative (HIPC) for which Cameroon qualified in March 2005. The RUYSP has received a total of 29,879 applications and some 4 170 youths mobilised in the 17 branches of the program. Equally, 1 275 business plans were prepared for the period of 2007 and 2008. In 2007, 185 micro activities were funded and in 2008 some 723 micro activities were also funded. In 2009, 2 735 youths from 58 Divisions were mobilised by the program. In the mean time, in December 2009, the credit committee accorded 156 000 000 FCFA to 1 484 projects. The unit of observation in the RUYSP is a business establishment, which is a business or industrial unit at a single physical location that produces or distributes goods or provides services – for example, a single store or factory. Using information offers by RUYSP, we are able to assess whether an IPU is a stand-alone firm or a branch of a multi-business firm.

The second dataset, the NEF placed 16 981 persons on salaried employment, 6 563 on independent employment and funded 4 192 micro projects giving a total of 23 544 socio-economic insertion in 2008. In 2009, the NEF received and oriented 28 430 job seekers giving a total of 309 786 of persons received since its creation. The number of placements stood at 34 243. That is 23 935 salaried employment and 10 308 independently employed. In a whole,

152 597 placements have been made by the NEF. Equally in 2009, 8 955 were trained, while 6 679 promoters of projects were set up for 66.359 jobs generated.

One question is how to define the size of the market in which to measure the informal workers inflows that may either boost demand or influence the diversity of consumption choices. We can identify informal workers inflows from the survey data at the survey tract level. One limitation is that the RUYSP and NEF includes limited information on the composition of employment with respect to skill, informal workers status, or any other dimension. We use an extract of the CNHS and EESI data that covers all business establishments that were ever located in Douala and Yaoundé between 2001 and 2010. The CNHS sometimes detects business births with a lag – implies that using a 5-year window that is shifted forward by a couple of years relative to the survey may provide more accurate measurement of changes in employment and the number and types of businesses associated with informal workers inflows. Census-block level summary information of the data used in the analysis is reported in Appendix Tables.

Our data contained a wide range of topics relating to the informal populations which can be explored by using multivariate regression models and which allow, in the present analysis, for a detailed assessment of the determinants and factors associated with scale and composition of output.

### **3. Cross-Sectional Analysis**

In this section, we presented empirical evidence of scale and composition effect of Informalisation.

#### **Empirical evidence of the scale effects of informalisation**

##### ***Aggregate demand and scale effect of informalisation***

Detecting the scale effect is complicated, however, by the likely presence of two other effects that occur simultaneously. First, the outward labour supply shift associated with informalisation also contributes to higher total employment. And second, informal workers inflows may themselves be a response to outward demand shifts in industries that employ these individuals.

To try to identify the induced labour demand effect attributable to informalisation, we estimate whether informal workers inflows are associated with increased employment in industries where neither of the other two factors – labour supply shifts or reverse causality – are likely to play a major role. First, whereas the labour supply effects of informal workers inflows into a local economy can increase output of any industry, informal workers inflows are more likely to shift the demand for non-traded goods and services (Altonji and Card, 1991). But simply looking at employment changes in non-traded industries to infer demand effects could be misleading if informal workers inflows tend to increase labour supply relatively more in these industries. Thus, we also distinguish – among non-traded industries – those that are relatively intensive or relatively non-intensive users of informal labour. The industries that are non-intensive users of informal labour are more likely to reveal the demand effects of informal workers inflows, rather than the labour supply effects. Similarly, because these industries use informal labour less intensively, a positive association between informal workers inflows and employment at the local level is less likely to reflect prior labour demand shifts driving informalisation.

Table 1 displays how the interplay between these two industry characteristics can help to identify the demand effects of informal workers inflows. The Table breaks industries into four cells based on whether the goods and services they produce are traded or not, and based on whether they are intensive users of informal labour. In the top row, for traded industries, there is no particular output demand shift associated with informal workers inflows, and hence there is little to be learned about the scale effects of informalisation from looking at these industries. In the bottom row, for non-traded goods and services, there is an output demand shift associated with informal workers inflows. However, in those industries within this second row that use informal labour – shown in the second column – there is also a labour supply shift, and the informal workers inflow may reflect past demand shifts that have some persistence. Thus, an employment increase in these latter industries that is associated with informal workers inflows need not reflect output demand shifts caused by informalisation. In contrast, in the lower left-hand corner, for non-traded goods and services that do not intensively use informal labour, an increase in employment associated with informalisation is more likely to reflect output demand effects because informal workers inflows are less likely to generate labour supply shifts in these industries, and it is less likely in these industries that prior demand shifts generated the informal workers inflow.

**Table 1. Identification of demand shocks based on industry differences**

Effects of informal workers inflows	Informal workers non-intensive	Informal workers intensive
Traded	No output demand shift, no labour supply shift	No output demand shift, positive labour supply shift, potential informalisation response to prior demand shock
Non-traded	Positive output demand shift, no labour supply shift	Positive output demand shift, positive labour supply shift, potential informalisation response to prior demand shock

Based on Table 1, what kind of evidence would point to output demand effects of informalisation? First, we should see that informal workers inflows are associated with increased employment in non-traded industries. All else the same, the association might be weaker for the subset of these industries that are not intensive users of informal labour, but this prediction is not sharp because the effects in each industry depend on how labour supply and output demand shifts affect costs, prices, and output in the two sectors. However, a necessary condition for inferring that there is a scale effect on demand from informalisation is that we find a positive association between informal workers inflows and employment changes in non-traded industries that are non-intensive users of informal labour.

Of course, we cannot classify industries strictly on the basis of either traded status or use of informal labour, in part because there is a continuum of characteristics, and in part because these characteristics are not immutable. For example, an industry that is non-intensive in informal labour can still absorb informal labour. As a consequence, we cannot definitively assert that for the industries in the lower-left corner of Table 1 there is no positive labour supply shock from an inflow of informal labour. In addition, even if industries remain non-intensive users of informal labour, the inflow of informal labour into other industries can lead to an exodus of urban labour from those industries, boosting employment in the industries in the lower left-hand corner of Table 1. For both of these reasons, we characterize a positive effect of informal workers inflows on non-traded, non-informal intensive industries as only a necessary condition for inferring a scale effect of informalisation. As such, our empirical analysis of this question is suggestive at best.

### ***Econometric analysis of the scale effects of informalisation***

To explore the scale effects of informalisation on demand, we begin with a statistical model that relates employment in establishments in branch groupings (indexed by  $i$ ) located in a

given survey tract to the population of potential consumers residing in the same and surrounding tracts:

$$(1) \quad \log L_{ij} = \beta_i + \alpha_i \log Pop_{a(j)} + \varepsilon_i$$

$$(2) \quad Pop_{a(j)} = \sum_{k \in a(j)} (w_{jk} \cdot Pop_k).$$

In equation (1) and (2),  $L_{ij}$  is the employment in establishments located in survey tract  $j$ , and  $\varepsilon_i$  is the error term,  $Pop_{a(j)}$  is the labour force located in area  $a(j)$  (an area that encompasses but is larger than  $j$ ), the  $w_{jk}$  are functions of the distance between the centre of tract  $j$  and the centre of tract  $k$ , which we denote  $d_{j,k}$ . Rather than arbitrarily assuming some function declining in distance, we define weights based on the distances consumers travel.

For each tract  $j$ , we then calculate the number of tracts that are  $\delta$ -miles away from  $j$  ( $T_{j\delta}$ ), and set the weights in equation (2) equal to:

$$(3) \quad w_{jk} = \begin{cases} \frac{P_\delta}{T_{j\delta}} & \text{if } d_{j,k} \in \delta \\ 0 & \text{if } d_{j,k} > 50 \end{cases}$$

where  $P_\delta$  is the proportions of shopping trips in each household. The values of  $P_\delta$  vary depending on whether tract  $j$  is in Douala, Yaoundé, or elsewhere in the country.

In practice, we run separate regressions for different sets of industries. Informalisation contributes to the change in population: as informal workers flow into an area, the number of consumers increases and this may affect employment, through the increase in product and induced labour demand, as well as through the increase of firms in the agglomeration (or withdrawal of urban from the labour force).

In order to allow different effects of changes in the urban and informal workers populations ( $U$  and  $I$ , respectively), we can rewrite equation (1), ignoring subscripts, as  $\log E = \beta + \alpha \log (U + \theta I) + \eta$ , which can be transformed into

$$(4) \quad \log E = \beta + \alpha \log U + \lambda (I/U) + \eta,$$

using the approximation  $\log(U + \theta I) = \log(U[1 + \theta I/U]) \approx \log U + \theta I/U$ , and setting  $\lambda \equiv \beta \theta$ . Where  $\lambda \neq \alpha$  (that is,  $\theta \neq 1$ ) would suggest that the scale effects on demand differ between urban and informal workers.

It is the distinctions between sectors that are tradable or not, and that are more or less intensive in their use of informal labour, which allow us to identify segments of the economy where a positive association between employment growth and informal inflows is more likely to reflect demand-side effects induced by informalisation. To implement this approach, we have to classify industries along two dimensions: non-traded versus traded, and the intensiveness of use of informal migrant labour.

For the first classification, we would ideally categorize industries on the basis of estimates of the fraction of output that is non-traded. Since these estimates are not easily obtained, we have to rely on a standard, but somewhat arbitrary, classification of industries. Services have traditionally been classified as non-tradable industries. More broadly, this is arguably an appropriate definition for retail trade, construction, educational services, health care, social assistance, food services, repair and maintenance, personal and laundry services, and private household services – and in what follows we will refer to this set of industries as non tradable (NT). Industries including transportation, warehousing, accommodation services, and public administration, as well as information, and finance, insurance, and professional services, may more often serve a larger population than urban residents (Kletzer and Jensen, 2006), while agriculture, mining, manufacturing, utilities, and wholesale trade are more easily classified strictly as traded sectors (TR).

With regard to informal individual's intensiveness, we use information on the existing sizable differences in the likelihood of employment of informal individuals across industries. As shown in Table 2 – Panel A, in 2007, informal individuals made up around 90.4 % of the total labour force in Cameroon. However, informal shares in the labour force of sectors (Panel B) were higher in services 36.6 %, than in industries 35.4 % that we classify as strictly tradable. Notably, all of the other strictly tradable industries – that is, the manufacturing sub-industries (agri-food) and wholesale trade – have higher-than-average intensity in the use of informal labour. On the contrary, among non-tradable industries, some are more informal-intensive (accommodation and food services; repair, personal, and household services; construction), and others are less informal-intensive (retail trade; health care and social assistance; educational services). As argued earlier, it is in these last three sectors that an increase in employment associated with informalisation can be taken as more likely to reflect output demand effects, and less likely to be contaminated by labour supply shifts or reverse causality. Both education and health services, however, may be less informative regarding the scale effects of population growth on demand to the extent that an increase in utilization of

these services does not necessarily translate into an increase in employment. The study of these two sectors is nevertheless of interest in light of the debate on whether informalisation puts strain on schools, hospitals, and other public services.

**Table 2. Informal workers share in the Cameroonian labour force (Panel A), by industry (Panel B)**

Panel A

	Urban	Rural	Cameroon
<b>Non-agricultural informal</b>	67.4	22.5	35.2
<b>Agricultural informal</b>	10.3	72.9	55.2
Formal private	11.8	2.0	4.7
Public	10.5	2.6	4.9
Total	100	100	100

Panel B

	Informal non-agricultural	Formal private	Public	All
<b>Industry</b>	<b>35.4</b>	<b>39.6</b>	<b>10.5</b>	<b>33.1</b>
Agri-food	18	16.3	0.2	15.9
Clothes production	6.3	1	2.2	5.3
Construction	4.8	7.7	0.3	4.6
Other industries	6.3	14.6	7.8	7.3
<b>Trade</b>	<b>28</b>	<b>10.9</b>	<b>-</b>	<b>23.3</b>
Wholesale	2.1	5.8	-	2.3
Retail	25.9	5.1	-	21.1
<b>Services</b>	<b>36.6</b>	<b>49.5</b>	<b>89.5</b>	<b>43.5</b>
Transport	7.1	9	1.9	6.7
Food service industry	9.6	2.8	0.2	7.9
Repair	4.6	1.8	-	3.8
Other services	15.3	35.9	87.4	25.1
<b>Total</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>

Source: INS, EESI 2010, Phase 1.

Table 3 reports the relationship between employment in a survey tract and the population residing in that tract and surrounding tracts. The dependent variable is the logarithm of the number of employees in CNHS microenterprises in a given industry or set of industries in tract  $j$ .

Results A reports estimates of equation (3), and results B of equation (4). Population is calculated as the logarithm of the weighted population in tract  $j$  and surrounding tracts, where the weights are defined as in (3). Likewise, the ratio of informal workers to formal one is calculated as the ratio of the weighted rural population and the weighted formal population. Different columns correspond to different industry restrictions. Given the uneven size of different tracts and industries, regressions are weighted by the number of employees in tract  $j$  and industry  $i$  in 2010. Standard errors are clustered at the Metropolitan Statistical Area



(MSA) level to correct for heteroscedasticity and arbitrary correlation across tracts located in the same MSA.

**Table 3. Employment growth across census blocks and population growth in surrounding areas**

	All	NT	NT non-informal workers intensive			
			All	Retail	Education	Health
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A						
$\Delta \log$ population	0.514** (0.093)	0.233** (0.087)	0.036** (0.241)	0.428** (0.099)	0.282* (0.403)	0.541** (0.025)
Panel B						
$\Delta$ informal/formal ratio	0.327** (0.112)	0.833* (0.255)	0.276 (0.492)	0.088*** (0.828)	0.141 (0.547)	-0.317 (0.137)
$\Delta \log$ urban workers	1.923** (0.043)	0.830** (0.030)	0.240** (0.061)	0.627*** (0.616)	0.961** (0.421)	0.931*** (0.326)
F-test [ $H_0: \theta=1$ ]	7.626	2.885	11.632	2.721	4.684	13.243
Prob.>F	0.034	0.076	0.005	0.199	0.027	0.000

**Notes:** Standard errors (in parentheses) are clustered at the MSA level. \* = significant at 10% level; \*\* = significant at 5% level; \*\*\* = significant at 1% level.

As shown in column 1, Panel A, a 1 % increase in population is associated on average with a statistically significant 0.5 % increase in employment when looking at all industries. By focusing on non-tradable industries instead of all industries, we can better isolate the association due to the changed demand that the increasing population may cause for such goods and services. As shown in column 2, the estimate is quite similar. Columns 3 through 6 further restrict the set of industries considered, to those that make below-average use of informal labour – retail, education, and health services – first in combination, and then separately. In each case, we find approximately a 1-to-1 relationship between employment and population changes.

To focus more sharply on informalisation, Panel B separately estimates the contribution to employment variation of informal workers and urban population variation. The estimated relationship between employment growth and urban population growth is very similar to Panel A. On the contrary, the association between employment growth and the change in the ratio of informal employment to formal is generally smaller – not only overall, but also in non-traded industries (column 2) and more so for those that are non-informal intensive (column 3). However, when disaggregating the analysis further across the specific non-traded, non-informal intensive sectors, we find considerable heterogeneity. In the retail sector, the contribution of informal population growth to employment growth is positive and significant (column 4); the estimated effects are consistent with the existence of informalisation-induced

scale effects on demand for retail that are as nearly as large as the effects arising from urban population growth. On the contrary, only for educational services and health is the contribution of informalisation neither economically nor statistically significant.

The findings for these last two sectors could be consistent with congestion and overcrowding of schools and hospitals following informalisation, assuming that demand increases but employment does not. However, since we estimate large and positive employment effects associated with urban population growth, the findings seem more likely to reflect lower utilization of these services by rural-born individuals. In the case of health care services, this could stem from the lower average age of adult informal workers or from positive selection, both of which would predict better health status among informal workers than formal. In the case of educational services, lower utilization by rural individuals may mechanically stem from the lower share of the rural population that is less than 15 years old.

**Table 4. Growth in the number of IPU across census blocks and population growth in surrounding areas**

	All	NT	NT non-informal workers intensive			
			All	Retail	Education	Health
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A						
$\Delta \log$ population	0.386** (0.091)	0.756** (0.241)	0.618** (0.094)	0.257** (0.234)	0.255** (0.207)	0.889** (0.097)
Panel B						
$\Delta$ informal/ formal ratio	0.248** (0.069)	0.318 (0.087)	0.151 (0.376)	0.501 (0.434)	0.403 (0.522)	0.191 (0.199)
$\Delta \log$ urban workers	0.606*** (0.021)	0.532** (0.261)	0.378** (0.091)	0.081** (0.512)	0.413** (0.201)	0.383** (0.250)
F-test [ $H_0: \theta=1$ ]	11.297	8.109	7.743	4.016	2.341	12.943
Prob.>F	0.005	0.014	0.009	0.082	0.198	0.001

**Notes:** Standard errors are in parentheses. \* significant at 10% level; \*\* significant at 5% level; \*\*\* significant at 1% level.

We turn next to the relationships between changes in population and changes in the number of establishments in different sectors. The latter is just another indicator of the change in economic activity, but if we get different results than for employment it could tell us something about changes in the composition of businesses, which we will explore more fully when we turn to the question of composition effects. Table 4 presents estimation results from the same specifications used in Table 3, except that the dependent variable is the 2001-2010 change in the logarithm of the number of establishments. The regression estimates are now weighted by the number of establishments in tract  $c$  and industry  $i$  in 2010. The estimated relationship between growth in the number of establishments and population growth is

positive, both in the overall economy and in non-traded sectors (Panel A). Interestingly, though, as shown in Panel B, the association between growth in the rural-born population and growth in the number of establishments is not statistically significant in any of the non-traded sectors that are not informal intensive, including the retail sector. The contrast with the results for employment in retail suggests that informalisation may affect the composition of business establishments.

## **Empirical evidence of the composition effect of informalisation**

### ***Composition/variety effects of informalisation***

We explore the “composition” effects of informalisation by studying the association between informal workers inflows and the “diversity” of the retail businesses located in a given area. Note that in this case we are not concerned with abstracting from the effects of labour supply shifts induced by informalisation, as these shifts may play a role in increasing the diversity of consumption choices under the likely assumption that informal workers have a comparative advantage at producing local goods.

We look at this question along a number of dimensions. First, for retail stores, we examine how informal workers inflows are associated with changes in the numbers of chain versus stand-alone establishments, as well as establishments of different sizes. The idea behind this analysis is that a larger number of small and especially stand-alone establishments – in contrast to large and/or chain stores – may be associated with increased diversity of consumption choices. Informal workers inflows might lead to a proliferation of small or stand-alone establishments to cater to their specific tastes that might not be met by the larger, chain stores. On the other hand, if informal workers have greater price elasticities of demand (consistent with Simonovska, 2015), or if they tend to consume the products in which the large chain stores specialize, their arrival could shift the composition of businesses in the opposite direction.

It is possible to identify the effects of informalisation on the diversity of consumption choices. We now examine whether rural-urban low skilled employment – and in particular increases in national diversity in the population – are associated with a higher share of agricultural seller and greater diversity of the traditions of farming in the local market.

Of course, the mere presence of small local-diverse business does not mean that urban are better off. Although we do not attempt to estimate the actual welfare gains from diversity, a

prerequisite for such gains would have to be that urban consume from the local or homemade products that get created. Casual observation suggests that the clientele and/or supplier of informal enterprises seller for example are not limited to traditional goods of regional origin. And in fact a limited amount of Cameroonians research documents this. According to Walter (2006), 90 % of the domestic market, both for product supply (over 90 % of IPU buy their raw materials from other informal businesses) and for sale of goods (only 5.6 % of turnover is generated with formal enterprises). The agri-food industry accounts for three-fifths of industrial activities and primarily serves as a means of providing food for the sector's population. The same applies for the clothing and construction sectors, which respectively account for 10.9% and 8.7% of industrial activity, as they are mainly focused on production designed to meet the needs of this purchaser. The trade sector responds to the same sort of demand, given that it is dominated by retail, which accounts for 94% of trade activities. It primarily concerns agri-food products (56%), clothing and accessories (22%) and other day-to-day household consumer products. The main customers of nearly 90% of IPU owners are households, and this applies whatever their place of residence.

Our analysis is based on detailed national classifications of ambulant sellers, and characterizations of variety based on Finance Law of 2013, Chapter III, Annex I. Although the focus on ambulant is narrow, the advantage of looking at this sector is that we know what types of goods an ambulant's consumers are purchasing. In contrast, although we suggested above that growth of large chain stores at the expense of small retailers implies less diversity in consumption, chain stores, in principle, could offer a variety of local goods – although casual observation suggests that their offerings are in fact quite homogenous.

### ***Econometric analysis of the composition/diversity effects of informalisation***

We estimate models that relate measures of the composition of business establishments to measures of the composition of the population by zone. Our interest in this analysis is in how informalisation affects the consumption options of residents of a particular survey block. Because these residents may travel to surrounding tracts when they shop or go out to eat, and because the consumption choices in these surrounding tracts (as well as their own tract) are likely, in general, to be shaped by the role of informal workers as consumers, in this analysis both the dependent and independent variables are defined as aggregates of blocks that correspond to the shopping area centred on a given tract of residence  $c$ , using the weights defined in equation (2). We therefore estimate equations of the form:

$$(5) \quad \log Estab\_share = \theta + \delta \log(I/Pop) + \phi \log Pop + \xi,$$

The coefficient  $\delta$  captures the potential effect of the informal workers share of the population on the composition of businesses. Since size per se arguably leads to more diversity, the equation also controls for changes in the population. Because the equation is estimated in first-differences, the estimates are not influenced by time-series relationships between structural changes in the economy – such as the advent of modest box retailing – and informalisation.

When we turn to the narrower analysis of ambulant, the consumption choices available to urban may also be shaped by the role of informal as workers, because informal workers may have a comparative advantage in the production of local goods. In this analysis, therefore, we also estimate equations where the informal share of the population is defined in area  $a(c)$  centred on  $c$ , but defined using weights that map the distribution of commuting-to-work trips, rather than the distribution of shopping trips.

We focus first on the retail sector. Table 5 looks at changes in the share or number of stores by size of the business, using three size categories: stores with fewer than 2, 2 to 10, and 10 or more employees. As shown in Panel A, growth in the share of the rural-born population is associated with an increase in the share of very small retail establishments and declines in the shares of both medium-sized and large stores (although the latter effect is not statistically significant). As shown in Panel B, this compositional change stems primarily from a drop in the number of small stores. The estimates imply that a 1% increase in the share of the rural-born population is associated with a 4% boost in the number of small establishments.

As suggested earlier, an increasing share or number of small retail establishments may be associated with great diverse consumption choices. This argument is more likely to hold for products such as food, clothes, or other consumption goods such as decorations and gifts, but is less relevant for items such as auto parts, hardware, or electronics – because the latter are more likely to be uniform across stores of different sizes, and at any rate unlikely to display variation in the “locally” of goods. We therefore next restrict the analysis to the subset of the retail sector in which it is more likely that more small stores implies greater diversity (possibly along local lines); we define this subset to include grocery, clothing and general merchandise stores, as well as a series of miscellaneous stores that specialize in items such as art supplies, posters, coins, decorations, or collectibles. As shown in columns 4 through 6, in

this case, also, growth in the share of the rural-born population is associated with a rise in both the number and share of very small retail stores.

**Table 5. Growth of IPU of different sizes and growth in the rural-born share across census blocks**

Retail stores	All			Food, Clothing, General Merchandise, Miscellaneous		
	1-2	2-10	10+	1-2	2-10	10+
Number of employees	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Dependent variable: $\Delta$ log share of stores						
$\Delta$ log informal share	0.032*** (0.017)	0.255** (0.235)	-0.390 (0.147)	0.039*** (0.029)	0.468*** (0.254)	-0.390 (0.171)
$\Delta$ log population	0.028** (0.051)	0.327*** (0.099)	-0.030 (0.026)	0.091 (0.041)	0.133 (0.263)	0.518** (0.321)
Panel B: Dependent variable: $\Delta$ log number of stores						
$\Delta$ log informal share	0.065*** (0.042)	0.067** (0.440)	-0.174 (0.083)	0.275** (0.110)	0.091 (0.098)	-0.061 (0.204)
$\Delta$ log population	0.307*** (0.050)	0.906* (0.201)	1.108*** (0.065)	0.905** (0.250)	0.976** (0.027)	1.444*** (0.125)

**Notes:** Standard errors are in parentheses. \* significant at 10% level; \*\* significant at 5% level; \*\*\* significant at 1% level.

In the next two tables we look at the same question but characterizing the composition of retail stores differently. In Table 6 we study the differential growth in small businesses, identified on the basis of the number of establishments in Douala-Yaoundé metropolis with the same market segmentation over space and time. First, we identify stand-alone stores as those with no other establishments in Douala-Yaoundé with the same market segmentation. We find that an increasing share of informal workers in the population is associated with both greater shares of and larger stand-alone stores (columns 1 and 3). We find similar results when extending the analysis to a more broadly defined group of small businesses – including not only stand-alone stores but also small chains, which are identified as stores for which no more than 1 other stores share the same market segmentation (columns 2 and 4). As it turns out, though, these findings are driven by the stand-alone stores; when we run the analysis separately for small chains but excluding the stand-alone stores (columns 3 and 6), we find that an increasing share of informal workers in the population is associated with a smaller share of stores in small chains (and no effect on the number of such stores). Thus, the sharpest result is that an increasing informal share is associated with raise in stand-alone retail stores.

**Table 6. Growth of stand-alone or small-chain IPU and growth in the rural-born share across census blocks**

Retail stores	All			Food, Clothing, General Merchandise, Miscellaneous		
Number of stores with same headquarter	1	1-10	2-10	1	1-10	2-10
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Dependent variable: $\Delta$ log share of stand-alone or small-chain stores						
$\Delta$ log informal share	0.921** (0.025)	0.606*** (0.057)	-0.096** (0.124)	0.433*** (0.158)	0.506*** (0.012)	-0.985* (0.033)
$\Delta$ log population	0.950*** (0.034)	0.501*** (0.015)	-0.314 (0.033)	0.073 (0.062)	0.031*** (0.041)	-0.039 (0.293)
Panel B: Dependent variable: $\Delta$ log number of stand-alone or small chain stores						
$\Delta$ log informal share	0.314** (0.022)	0.228*** (0.036)	-0.048 (0.212)	-0.742** (0.222)	-0.304* (0.121)	-0.021 (0.082)
$\Delta$ log population	0.6563** (0.107)	0.682*** (0.250)	0.937*** (0.511)	0.487*** (0.159)	0.671*** (0.315)	0.598** (0.102)

**Notes:** Standard errors are in parentheses. \* significant at 10% level; \*\* significant at 5% level; \*\*\* significant at 1% level.

In Table 7, we look instead at large chains. Specifically, we exploit the non-confidentiality of the CNHS data to examine effects of informal workers inflows on particularly large and well-known small-box retailers. Columns 1 and 2 use a narrow list, including Home-Based Enterprises (HBEs) in urban residential neighbourhoods, while in columns 3 and 4 the list is expanded to also include open-air markets of street-walker, the street-corner and store-owner entrepreneur (Achua, 2014), for example, small independent stores, kiosks, and non-organised open-air markets, food retailers colloquially called “buyam-sellams” (the pidgin term for buyers, sellers, wholesalers, and intermediary traders. It refers to a small foodstuff retailer in urban centers; it comes from the English verbs ‘buy’ and ‘sell’), roadside drug-vending, callbox operator. In 2010, there was on average one small-box retailer from the short list for every 3 Census Blocks, and one small box retailer from the long list for every 10 blocks. For the two definitions, the average change in the number of small-box stores between 2007 and 2010 is one more store for every 42 blocks (short list) or 10 blocks (long list). Most of the IPU that belong to these chains are reported to belong to the retail sector, but there are some cases in which the sector of activity is wholesale trade (on average, fewer than 10%). In columns 1 and 3 we consider all IPU belonging to each chain, and in columns 2 and 4 we restrict attention to the retail stores only, as in the preceding analyses in this section.

**Table 7. Changes in the number of small-box retailers and changes in the rural-born share across bundles of census blocks**

Small-box retailers	Short list		Long list	
	Wholesale and retail trade	Retail trade only	Wholesale and retail trade	Retail trade only
Reported sector of activity	(1)	(2)	(3)	(4)
Panel A: Dependent variable: $\Delta$ number of small-box retailer establishments				
$\Delta$ informal share	0.0189*** (0.026)	0.279*** (0.058)	0.302 (0.150)	0.136*** (0.053)
$\Delta$ log population	0.082** (0.071)	0.058** (0.029)	0.242** (0.017)	0.035** (0.072)
Panel B: Dependent variable: $\Delta$ share of small-box retail/total retail establishments				
$\Delta$ informal share		0.016 (0.005)		0.019* (0.009)
$\Delta$ log population		0.009* (0.003)		0.029** (0.012)

**Notes:** Standard errors are in parentheses. \* significant at 10% level; \*\* significant at 5% level; \*\*\* significant at 1% level.

For these different definitions, we regress the change in the number of big-box retailer establishments on the change in the share of the rural-born population and the change in the log total population. The estimates indicate that increases in the informal share are associated with more small-box retail establishments. In particular, the estimates in columns 2 and 4 imply that a 1% point increase in the rural-born population (which is the standard deviation of the rural-born share across tracts) is associated with one more small-box store from the short list for every 59 tracts, and one more big-box store from the long list every 40 tracts. As shown in Panel B, increases in the share rural-born are also associated with increases in the number of small-box retailers as a fraction of all retail establishments, although the estimate is significant only for the longer list of small-box chains.

A potential issue in interpreting the estimates of the coefficients on the change in the rural-born share of the population in this last analysis is the endogenous location of informal. Despite using first differences, we cannot rule out bias from time-varying local factors associated with both changes in the number of retail establishments and informal workers inflows. Small-box retailers may be located in areas where land values are increasing more gradually than in other areas, a factor that may also be associated with larger informal workers inflows. We cannot directly test this hypothesis, but we did find that between 2001 and 2010 the rural-born population share did not grow faster in areas with a larger concentration of small-box retailers in 2010, providing some evidence against this particular non-causal interpretation of our estimates.



If we assume that diversified products are more likely to be provided by a large number of stand-alone retail stores, and less likely to be provided by chain stores and especially big-box retailers, then the findings reported in this section suggest that, rather than decreasing diversity, informal may have the opposite effect. This could be due to lower income levels, greater thrift, or greater price sensitivity that favours street-walker and open-air markets over smaller outlets. However, since we lack information on the types of goods that consumers can buy at different stores, this conclusion is somewhat speculative. In the next section, we turn to the analysis of the agricultural sector, for which we can more readily associate the type and variety of IPU with the nature of the consumption choices they offer.

The industrial classification of establishments in the CNHS is extraordinarily poor: the dataset not includes digit SIC (Standard Industry Classification) code that in the case of consumption places can separately identifies production of different business. The full list of specific categories as well as other types of economic activity is provided in Appendix Table A2. On the other hand, a shortcoming of the CNHS data is that around 30 % of establishments in the agriculture sector are generally classified as “street- corner,” without identification of a specific category. The availability of the company name, however, allows us to substantially refine the classification. For example, we can easily identify IPU that belong to well-known chains such as discounters, convenience stores, mixed retailers, health and beauty retailers, clothing and footwear retailers, furniture and furnishing stores, DIY (Do It Yourself) and hardware stores, durable goods retailers, leisure and personal goods retailers. More important, we can also use the category name to identify street-walker and open-air markets that may have been misreported as generic market places. We do so by searching for words included in the business name that point to a specific location (e.g., “Central market” or “Big market,” “Sandaga market” or “fruits market,” “Mokolo market” or “Mokolo”, “Mfoundi Market”, or “Mfoundi”, etc.), or for words from the ethnic language of reference (e.g. “Bamiléké,” “Béti,” or “Haoussa”, etc.).

Paralleling the analysis of the previous section, we are interested inexploring whether the presence of a large (and diverse) rural-born population increases the choices of product available to urban. First, we study the cross-sectional correlation between changes in the share of local or tribal cultivation and changes in the rural-born share of the population, as in:

$$(6) \quad \log Local\_share = \theta + \delta \log(I/Pop) + \phi \log Pop + \xi,$$

**Table 8. Changes in the log share of informal local famers and changes in the share of rural-born population across bundles of Census blocks**

	Informal local famers over all market places		Young local famers over all market places	
	Excluding self- consumption	Excluding self- consumption, nonfarm activities, indirect agriculture practices	Excluding self- consumption	Excluding self- consumption, nonfarm activities, indirect agriculture practices
	(1)	(2)	(3)	(4)
Panel A: Aggregation of all variables using weights from distribution of shopping trips				
$\Delta$ log informal share	0.290*** (0.044)	0.392** (0.096)		
$\Delta$ log informal young share			0.463** (0.084)	0.539** (0.065)
$\Delta$ log informal non-young share			0.310 (0.029)	-0.141 (0.098)
$\Delta$ log population	0.085 (0.079)	- 0.111(0.011)	0.102(0.167)	0.040**(0.178)
Panel B: As (A) except local share defined using working weights				
$\Delta$ log informal share	0.551***(0.201)	0.310***(0.096)		
$\Delta$ log informal young share			0.518***(0.097)	0.248***(0.066)
$\Delta$ log informal non-young share			0.015 (0.058)	-0.084 (0.177)
$\Delta$ log population	0.096 (0.090)	- 0.018(0.094)	0.206(0.101)	0.358**(0.123)
Panel C: Aggregation of variables across MSA's				
$\Delta$ log informal share	0.743**(0.098)	0.695**(0.097)		
$\Delta$ log informal young share			0.250***(0.039)	0.163**(0.010)
$\Delta$ log informal non-young share			0.040 (0.034)	-0.021 (0.416)
$\Delta$ log population	0.968***(0.344)	-0.756**(0.314)	0.267(0.234)	-0.057 (0.265)

**Notes:** Standard errors are in parentheses. \* significant at 10% level; \*\* significant at 5% level; \*\*\* significant at 1% level.

Table 8 presents estimates of equation (6) for three different levels of aggregation: in Panel A we add up the number of farmers and all population figures in tracts using the shopping weights defined in (2); in Panel B, we use shopping weights to define the growth of farmers and of the total population, while we define the growth in the informal share of the population ( $I/Pop$ ) on areas centred on  $c$  but defined using commuting-to-work weights; finally, in Panel C we aggregate all variables across the 25 MSA's in Douala-Yaoundé. Regardless of the level

of aggregation, we find that an increase in the rural-born share of the population is associated with sizable increases in the share of local farmer.

The effects are larger when defining the informal share in an area that more closely represents the size of the labour market, suggesting that labour supply shifts may play an important role in the growth of agricultural sellers (Panels B and C). For example, in column 1, when we define the dependent variable as the ratio of informal agro-seller to all open-air markets (except self-consumption), we find that a 1 % increase in the rural-born share in the shopping area centred on  $c$  is associated with a 0.29 % increase in the share of local farmer in the same area, while a 1 % increase in the rural-born share in the commuting-to-work area centred on  $c$  is associated with a 0.55 % increase in the share of local farmer in the reach of consumers residing in tract  $c$ . The results are robust to an alternative definition of the share of local farmer, that is, the ratio of informal local farmer to all market places excluding not only self-consumption but also nonfarm activities and indirect agriculture practices (column 2).

If these positive associations are really an effect of informalisation, then the traditions of the ambulant that “result” from informalisation ought to be associated with the locality of the informal workers. To test this prediction, we estimate the relationship between the growth in the share of young farmer and the growth in both the share of young and old rural-born in the population. We focus on younger informalisation because it was by far the largest informal inflow in our sample period. As shown in columns 3 and 4, we find that the within locality correlations are positive and significant, regardless of the level of aggregation, while the cross-ethnicity associations are generally not significant, either economically or statistically (and are opposite-signed).

#### **4. Conclusions**

In this paper, we direct attention to other possible economic effects of informalisation. These effects stem from two factors: first, that informal workers bring not only their labour supply with them, but also their consumption demands; and second, that informal workers may have a comparative advantage in the production of local goods.

We focus first on the effects of informalisation on the scale of consumption demand and its induced effect on labour demand. To isolate scale effects, we estimate the relationship between employment changes in industries that should be affected by the inflow of informal

workers into a domestic economy via the consumption demands of these informal workers rather than their labour supply – in particular, non-traded industries that are not intensive users of informal labour. We find that population inflows into a local economy boost employment in these industries. When we estimate the separate effects of informal workers inflows, the evidence of scale effects is weaker, although it is quite strong in the retail sector – which is where we would expect to find such effects.

The more extensive empirical analysis we conduct focuses on the effects of informalisation on the composition of output, stemming from the fact that informal workers are consumers with potentially different demand characteristics and also may have a comparative advantage in the production of local goods. We look at these composition effects in a number of ways. First, we estimate the relationship between informal workers inflows and the size distribution of business establishments. This analysis indicates that informalisation is associated with greater stand-alone retail stores, and a fewer number of chains and in particular small-box retailers. This evidence would appear to confirm a diversity-enhancing effect of informalisation, although we cannot draw firm conclusions because we do not have information on the types of goods that consumers buy at different stores.

Consequently, we focus more of our attention on the relationship between informalisation and the product diversity of farmers-sellers, for which we can much more readily identify the types of products consumed by customers. On this issue, the evidence indicates quite clearly that informalisation is associated with increased product diversity of agriculture, and that labour supply shifts play an important role in the growth of local small farm for food production.

Our findings support the existence of some economic benefits of informalisation that have been rarely documented in the literature. Although a statement about welfare would require a more structural approach, the diversity effects of informalisation in the ambulant sector expand urbans' consumption choices and, as such, are potentially welfare-enhancing. We find that these effects likely stem from comparative advantages of informal workers in the production of local good from their department of origin. We also find some evidence consistent with benefits to urban from the consumption effects of inflows of informal labour, which shift product demand in the retail sector outward, thus mitigating the negative effects of labour supply shifts on urbans' wages. On the other hand, with respect to the composition of

the retail sector, one might plausibly view our evidence as suggesting that informal workers inflows increase the homogeneity rather than the diversity of consumption choices.

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## APPENDIX TABLES

**Appendix Table A1. Summary information of NT and TR, across Census tracts, 2005**

	Turnover	Production	Value Added	Gross Operating Surplus	Apparent productivities		
					VA/L1*	VA/L2**	VA/K***
Sectors and industries							
Industry	88 100	87 600	48 900	42 000	30 800	272	302
Agri	59 000	58 700	21 300	20 100	13 900	162	250
Confection	78 300	76 800	44 300	42 100	31 700	204	186
BTP	152 900	152 600	124 100	83 300	56 600	326	874
Other	158 700	157 900	106 800	94 000	65 700	476	283
Trade	292 400	86 300	68 300	65 300	50 700	284	520
Wholesale	1 288 200	340 700	276 100	264 300	196 300	1 237	596
Retail business	230 800	70 600	55 500	53 000	41 300	229	501
Services	196 900	175 380	79 800	74 600	53 000	307	286
Transport	207 100	207 100	111 500	100 900	85 800	363	264
Restoration repair	216 700	201 200	60 600	58 400	38 000	244	264
Other services	100 100	96 700	69 600	63 800	44 200	221	225
Other	196 800	146 300	100 100	92 600	69 500	434	362
Together	173 800	110 200	62 400	57 000	41 600	287	339
Middle							
Urban							
Industry	155 100	153 800	80 900	66 200	47 200	296	268
Trade	385 900	115 900	93 700	89 100	71 400	355	490
Services	266 000	238 300	111 000	102 600	71 200	363	293
Together	275 200	198 300	95 500	86 500	62 900	340	332
Rural							
Industry	63 100	62 900	37 000	33 000	24 000	255	336
Trade	190 700	54 100	40 800	39 500	29 400	189	616
Services	122 800	107 900	46 400	44 500	31 900	221	270
Together	104 600	70 500	39 800	36 900	26 800	228	352

**Notes :** \* VA / L1 is productivity per worker expressed in FCFA; \*\* VA / L2 is productivity per hour of work expressed in FCFA; \*\*\* VA / K is capital productivity valued at replacement cost and also expressed in FCFA.

**Source:** INS, EESI 2005, Phase 2.



**Appendix Table A2. Distribution of IPU in Cameroon by employment, 2003-2006**

	2003	2004	2005	2006
Subsistence farming	2546,29	2748,79	2953,01	3180,12
Agriculture industry and for export	1308,88	1494,50	1666,62	1880,77
Breeding and hunting	59,99	61,72	64,57	66,98
Forestry and logging	74,61	85,68	102,07	119,41
Fishing and fish farming	93,71	82,79	80,22	74,30
Hydrocarbon extraction	0,63	0,70	0,70	0,75
Other mining and quarrying	4,23	4,43	4,64	4,86
Meat industry and fish	117,07	124,98	131,34	139,11
Working grains	137,34	149,96	160,43	173,40
Coffee Industry cocoa, coffee, tea and sugar	2,87	3,10	3,09	3,21
Industry of vegetable or animal origin oilseeds	24,62	26,32	27,63	29,28
Manufacture of cereal products	45,82	47,44	49,64	51,67
Industry milk, fruits, vegetables and other	5,93	6,63	7,39	8,26
Beverage industry	5,67	6,65	7,63	8,85
Tobacco Industry	1,67	1,86	1,92	2,05
Textile and clothing	99,20	99,84	98,75	98,53
Manufacture of leather and footwear manufacturing	10,84	12,18	14,59	16,94
Wood industry, except furniture	48,87	53,94	61,01	68,16
Papermaking and paper	6,44	7,85	9,61	11,74
Oil Refining	0,92	1,12	1,53	1,98
Chemical industry and chemical manufacturing	3,83	4,34	4,68	5,17
Rubber Production	16,24	14,12	13,03	11,68
Manufacture of other manufactured goods	1,25	1,23	1,23	1,22
Fabricated metal products	5,11	6,44	7,85	9,74
Electrical machinery and equipment manufacturing	2,79	3,08	3,36	3,68
Equipment manufacturing and audio device	0,56	0,55	0,54	0,53
Transportation equipment manufacturing	1,02	0,98	0,94	0,90
Manufacture of furniture	53,59	59,04	65,24	71,99
Manufacturing and distribution of electricity, water and gas	5,82	5,97	6,25	6,49
Construction	142,66	138,98	141,77	141,36
Wholesale and retail trade	568,33	617,16	664,75	718,94
Repair activity	51,79	54,42	57,38	60,38
Restaurants and hotels	48,35	48,15	50,30	51,32
Transport, storage and communication	163,22	169,59	179,32	187,96
Post and telecommunications	5,02	4,65	4,72	4,58
Financial activities	5,78	5,75	5,92	5,99
Real estate activities	9,21	9,58	9,96	10,37
Service activities to companies	32,30	34,80	37,02	39,63
Service activities to companies	125,65	197,35	260,71	376,94
Apu and social security	86,91	127,23	164,14	226,01
Education	24,05	29,73	33,38	39,39
Health and social work	537,17	575,65	614,88	657,86
Services provided to the community				
Total	6486,25	7129,27	7773,76	8572,5

**Source:** Cameroon Statistical Yearbook, 2008.