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The Expansion of Global Consumption Diversity and the Rise of Niche Consumption

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The Expansion of Global Consumption Diversity and the Rise of Niche Consumption

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Abstract

Economic growth stimulates fundamental changes in consumption patterns, as consumers who get rich tend to spread their spending more evenly across a wider variety of goods and services. This diversification process magnifies the heterogeneity of spending patterns across the population of consumers within each country, as well as across countries. We empirically track how global consumption patterns grow more diverse as economies develop using entropy measures and show how different stages of economic development are characterized by major shifts in the distribution of final demand across goods and services. We study how this process exhibits path dependence and how economic growth stimulates increases in demand heterogeneity via rising income inequality on the macro level and rising household income on the micro level.

Keywords: spending diversity, economic development, income elasticity, economic complexity

JEL classification: D12, D83, J15, O12

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1 Introduction

“The pursuit of novelty, or at least of variety, is so pervasive a part of human action as to lead us to reject out of hand the hypotheses that (1) long-run (static) utility functions exist (2) long-run demand functions are stable and (3) that preferences are acyclic.” –Richard Day (1985)

The extent to which consumers possess similar or different spending patterns is a crucial enabling condition to realising economies of scale (Young, 1928; Bresnahan and Gambardella, 1998; Lipsey et al., 2005). Writing about US growth in the 19th century, Alfred Marshall argued that the fast rate of US growth was due to the homogeneity of demand among newly wealthy Americans, which created the basic conditions that enabled mass production of manufactured goods (Marshall, 1919; Rosenberg, 1972). Many US households grew rich simultaneously and entered the same type of markets, such as motor cars. In contrast, wealthy British households possessed highly differentiated preferences such that rising income generated demand growth that was more dispersed across different markets which inhibited the emergence of mass markets (Rosenberg, 1972). This concept was subsequently refined into the notion of ‘demand spillovers’ that featured in big push models of industrialization (Rosenstein-Rodan, 1943; Murphy et al., 1989).

Many contemporary growth models adopt a representative consumer approach that do not consider the degree by which the spending patterns of households expand and evolve in a synchronized manner across the population of consumers as economies develop. The pervasive pursuit of novelty by consumers poses a serious challenge for modelling macroeconomic evolution (Day, 1985). In this spirit, we examine how the evolution of global consumption patterns exhibit properties that characterise complex adaptive systems, including non-ergodicity (path dependence) and emergent properties (Durlauf, 2005). Richard Day passionately advocated for an alternative approach to studying the economy in which its deep structure adapted to the emergence of new technologies. Consumers also influence economic evolution: Day viewed consumers preferences as being endogenous in the sense that economic conditions (including rising affluence) and past experiences influence consumer preferences Day (1985). His work inspired a generation of scholars to pursue an alternative approach to studying the fundamental characteristics of macroeconomic evolution (Dopfer et al., 2004).

A critical feature of long-run demand growth is that as household income rises, the distribution of spending and the variety of goods that people consume tends to evolve dramatically. While at very low income levels household demand tends to be relatively homogeneous and mainly dedicated to food (Banerjee and Duflo, 2007; Clements et al., 2006), the situation is quite different among rich households who possess greater discretionary power. Richer households tend to consume a wider variety of goods (Theil

and Finke, 1983; Jackson, 1984; Falkinger and Zweimüller, 1996; Saviotti, 2002), higher quality goods (Bils and Klenow, 2001), and more services (Schettkat and Yocarini, 2006; Buera and Kaboski, 2012). This broad transformation can be viewed as an entropic process through which economic growth stimulates the emergence of diversity and more complex structures in markets (Georgescu-Roegen, 1971; Raine et al., 2006).

Using World Bank data on consumption patterns from the developing world, we track the broad manner in which households diversify their spending across goods across different levels of economic development. We do this by employing entropy index measures to track the dispersion of household spending across different goods, which we dub the ‘spending diversity’ (Theil, 1967; Clements et al., 2006; Clements and Gao, 2012). We further decompose the spending diversity into two different forces: changes in the variety of goods consumed (extensive margin) and changes in the spread of spending across existing goods (intensive margin).

We consider how this diversification process reflects an underlying hierarchy in consumer preferences (Foellmi and Zweimüller, 2008; Chai and Moneta, 2012). Faced with scarce income, consumers prioritise their spending: the highest priority goods (such as food) are attended to first and lower priority goods are consumed only when demand for high priority goods has been satiated. Comparing the order of income elasticities of different goods across 180 countries, we measure how similar these expenditure hierarchies are across rich and poor countries. As first conjectured by Linder (1961), we use the expenditure hierarchies to study whether the demand structure of countries is related to differences in GDP. Our findings show that the base of these expenditure hierarchies are relatively homogeneous across all countries in the world as the same basic necessities are found to have the lowest income elasticity across many different countries. However, the peaks of the expenditure hierarchies are more heterogeneous across countries as the order of luxuries in each country is more unique. We also highlight how the expenditure hierarchies are path dependent in the sense that the country’s history and its relationship with other countries shape the character of expenditure hierarchies.

We then study two particular channels through which economic growth (on the macro level) and rising household income (on the micro level) stimulate increases in the heterogeneity of demand. On the macro level, rising income inequality is a typical feature of economic development (Chotikapanich et al., 1998). In the presence of hierarchical preferences, this tends to desynchronise spending diversity in the population of consumers as GDP rises (Murphy et al., 1989; Bertola et al., 2014). We show how income inequality is correlated to the depth of the market as measured by market participation rates. If consumers have the same income levels and expand their spending into similar markets, this could help foster the emergence of depth in new markets, which helps producers over-

come large fixed setup costs (Chenery et al., 1986; Murphy et al., 1989). High levels of income inequality could accentuate differences in spending patterns such that marginal increases in household spending are more dispersed across a wider range of new markets, thereby limiting the emergence of mass markets and instead fostering the growth of niche markets. To date, studies considering the impact of income inequality on the composition of household demand have mainly been theoretical in nature (Foellmi and Zweimüller, 2006, 2017; Bertola et al., 2014; Ibragimov et al., 2017).

On the micro level, rising household income also drives up heterogeneity in spending as income grows (Blundell and Stoker, 2005; Calvet and Comon, 2003). Cross-section data consistently reveals that otherwise observationally identical people make different choices (Heckman, 2001). This heterogeneity grows with income, as consistently revealed in heteroscedasticity of Engel curves (Chai et al., 2015). Recent evidence suggests that this occurs because affluent consumers concentrate their spending into different areas of ‘niche’ consumption (Kiedaisch et al., 2018; Neiman and Vavra, 2019). This enables niche markets to emerge that offer innovative and customized goods at the expense of mass markets that offer standardized goods (Pine, 1993; Guerzoni, 2010; Amin, 2011). We track how spending diversification levels shift from being homogeneous at low income levels to being heterogeneous at high income levels.

This rest of the paper is structured as follows. Section 2 reviews some stylised facts that describe how composition of demand evolves as economies grow and households experience large, non-marginal rises in income. Section 3 presents the data used in our empirical analysis. Section 4 describes the empirical methods and Section 5 presents the results. Section 6 concludes.

2 Background

2.1 The diversification of consumer spending

As consumers get rich, they diversify their spending and a wide variety of goods and services enter the consumption basket. This diversification process has important implications for the economy as it can trigger the reallocation of resources across sectors (Pasinetti, 1983; Foellmi and Zweimüller, 2008; Boppart, 2014), shape international trade flows (Hallak, 2006; Matsuyama, 2019) and innovative activity (Saviotti, 2002; Foellmi and Zweimüller, 2017). Ever since the formulation of Engel’s law (Engel, 1856), much empirical evidence suggests that the composition of household spending undergoes fundamental changes as income rises. This includes:

- 1. Food dominates spending at very low income levels:** The expenditure of the

world's poorest is concentrated on food. Spending on food represented about 50 per cent to 70 per cent of their budgets (Banerjee and Duflo, 2007), while spending on many other goods is close to zero. Figure 1 below shows the distribution of household spending across goods for the lowest incomes segment (left hand side) and the highest income segment (right hand side) across all countries in the Global Consumption Dataset.¹ In the lowest income segment, food represents 46% large share of total spending.

2. **Engel's Law:** As income rises, the budget share dedicated to food spending declines (Houthakker, 1957; Theil and Finke, 1983; Clements et al., 2006; Clements, 2019). Figure 1 shows that the budget share of food spending declines from 46% in the lowest income segment to 15% in the higher income segment.
3. **Spending diversification:** Both cross country and cross sectional studies within countries have found evidence that rising affluence increases the number variety of goods consumed and stimulate consumers to distribute their spending more evenly across a wider range of goods and services (Theil, 1967; Theil and Finke, 1983; Jackson, 1984; Clements et al., 2006; Chai and Moneta, 2012; Kiedaisch et al., 2018; Li, 2021). The right hand side panel in Figure 1 shows that among the high income segment, spending is more evenly dispersed across all possible expenditure categories.
4. **Decline in homogeneity:** As income rises, the heterogeneity of spending patterns observed across a population of households tends to grow.² This is observed in the heteroscedasticity of Engel curves (Blundell and Stoker, 2005; Calvet and Comon, 2003; Christensen, 2014). This could be due to affluent consumers spending on high quality differentiated goods that are relatively unique. The average unit price paid for a good increases, which suggests that high quality goods are consumed (Bils and Klenow, 2001). Also, expenditure on services increases that are typically used in the customisation process(Langlois, 2001; Schettkat and Yocarini, 2006; Buera and Kaboski, 2012).

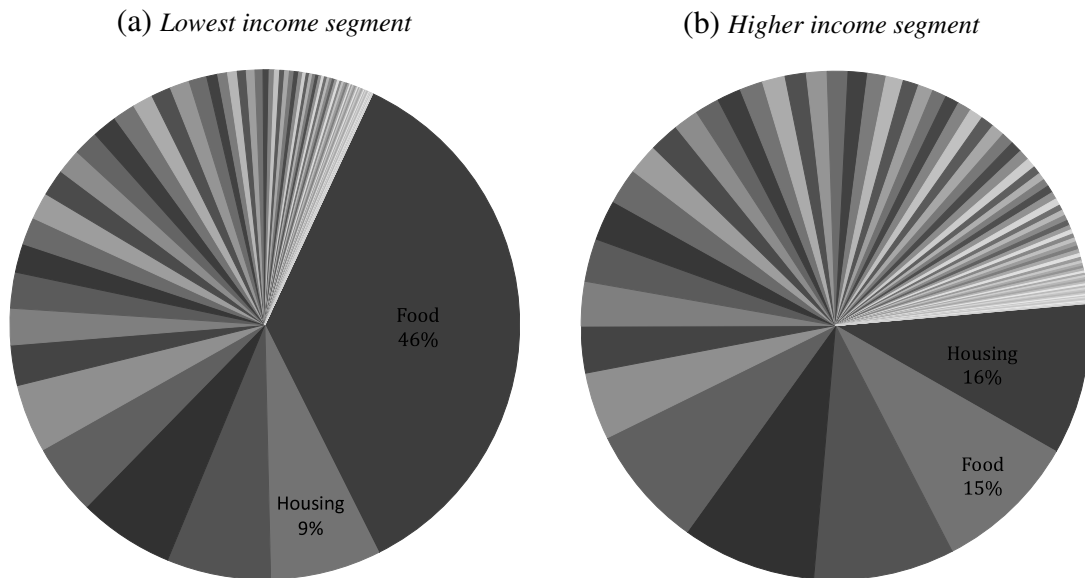
In spite of these established facts, many existing models of consumer demand assume that the composition of spending does not fundamentally change as income rises (homothetic preferences).³ Many scholars also assume that preferences are fundamentally

¹See Section 3 for details.

²We define heterogeneity as variation in the household spending patterns that is not accounted for by observable variables and is driven by actual differences in tastes, rather than sampling and measurement error (Chai et al., 2015).

³For example, the Cobb Douglas or CES preferences, assume that households consume strictly positive

Figure 1: The diversity of global consumption patterns across rich and poor income segments



Source: Global Consumption Dataset, 2011. The pie chart *on the left* reports the composition of spending among the lowest 50 per cent of the global income distribution across 90 countries. The pie chart *on the right* reports the composition of spending among the top 9 per cent richest consumers in the world.

similar across countries Stigler and Becker (1977), even though empirical results have rejected the hypothesis that preferences are homogeneous across nations (Selvanathan and Selvanathan, 1993; Carruth et al., 1999; Rathnayaka et al., 2022).

The stylized facts listed above support the notion that consumer preferences are non-homothetic. They also challenge the notion that consumer preferences are ahistorical and exogenous in the sense that macroeconomic conditions (including GDP and income inequality) and culture do not influence consumer preferences (Day, 1985; Bowles, 1998). Below we discuss how economic growth on the macro level and rising income on the micro level contribute to the growth of demand heterogeneity.

2.2 The hierarchy of consumer expenditure

To account for the stylised facts listed above, many conjecture that consumption patterns evolves according to a hierarchy of wants (Engel, 1856; Jackson, 1984; Murphy et al., 1989; Foellmi and Zweimüller, 2008; Bertola et al., 2014). According to this view, the sequence in which new goods enter the consumption basket and the manner in which consumers diversify their spending is not random. Rather, there is an order that reflects con-

amounts of all goods. Some notable efforts to reconcile some these aspects to CES preferences include (Foellmi and Zweimüller, 2008; Bertola et al., 2014; Neiman and Vavra, 2019; Matsuyama, 2002; Li, 2021)

sumer's priorities or wants. Faced with scarce income, consumers prioritise their spending, where the highest priority good are attended to first, and lower priority goods enter the consumption basket only when demand for high priority goods has been satiated at a given consumption level Chai and Moneta (2012).

Following Foellmi and Zweimüller (2008), consider a situation where goods and services are ranked by an index i . Low i goods correspond to those that enter the consumption basket first, i.e. goods of the higher priority, such as food. We have (assuming infinitely many goods and services):

$$u(c(i)) = \int_0^{\infty} \xi(i)v(c(i))di \quad (1)$$

where $v(c(i))$ is an indicator for the utility derived from consuming good i in quantity c and $\xi(i)$ is the hierarchy function that is monotonically decreasing in i ($\xi'(i) < 0$), so that low order goods get a higher weight than higher order goods. In terms of empirically tracking the preferences, scholars have estimated the hierarchy by studying the acquisition order of goods (Deutsch and Silber, 2008). We directly infer the hierarchy from the income elasticity of goods. The hierarchic nature of demand implies that the Engel curves are non-linear in the sense that goods start off as luxuries at low income levels and eventually become necessities as consumption reaches the saturation level s of expenditure (Pasinetti, 1983; Metcalfe et al., 2006; Moneta and Chai, 2014). As a result, there is a tendency for low i (most important priority such as food) goods to possess low income elasticities, while high i goods will possess high income elasticities.⁴

The existence of a hierarchy of goods helps explain why the budget share dedicated to food dominates among the poorest (point 1 above). Food is a basic necessity which is critical for biological survival (Ravallion, 1998). The concept of hierarchy also helps explain why Engel's law and spending diversification takes place (point 2 and 3 above). Given sufficient income growth, spending on food satiates and consumers re-direct their spending to other (higher order) priorities (Witt, 2001; Metcalfe et al., 2006). As rising income propels consumers up the expenditure hierarchy, history and culture takes a more prominent role in shaping the hierarchy (Cordes, 2009; Lades, 2013; Cordes, 2019). The concept of the expenditure hierarchy may also explain why the homogeneity of demand declines at high income levels (point 4 above). As economies grow and consumer spending shifts from necessities to high luxuries, it is likely that culture will stimulate differences in the order of goods in the expenditure hierarchy observed across counties.

⁴Theoretically there may be some exceptions. Among poor economies where a large part of the population possess subsistence level of income, the income elasticity for some low i good may be very high, while for high i goods may be zero (rather than very high).

2.3 Market depth and income inequality

If the population of consumers share the same hierarchy of expenditure i and the same income level, the tendency for consumers to diversify their spending and enter into new markets together in a synchronised fashion can play a crucial role in achieving economies of scale (Marshall, 1920; Murphy et al., 1989). Put simply, low volumes of demand can limit the degree to which firms specialize in production. If the markets are deep and the tastes of consumers are relatively homogeneous, this encourages economies of scale and specialization in production (Bresnahan and Gambardella, 1998). By contrast, if the volume of demand for a good is low or the character of demand is quite heterogeneous, the firms' incentive to supply the market will be limited.

The synchronised nature in which spending patterns grow is the key reason why Marshall thought that growth rates in the US were higher than the UK where consumers possessed relatively heterogeneous demand patterns (Marshall, 1920; Rosenberg, 1972). This idea was extended by Rosenstein-Rodan (1943) and Murphy et al. (1989) in the context of understanding the conditions for economic industrialisation and the takeoff of the manufacturing sector. An important ingredient for the emergence of a manufacturing sector is the possession of mass markets, i.e. large, geographically concentrated population with homogeneous tastes help create large markets for manufactured goods, such as bicycles and home electronics (Rosenstein-Rodan, 1943; Rosenberg, 1972; Matsuyama, 2002). Many empirical studies have found evidences that the most important source of growth in sectoral output is the size of the market (e.g. Chenery et al., 1975, 1986; Haraguchi and Rezonja, 2011).⁵

On the macro level, economic growth tends to be accompanied with rising income inequality. Income inequality tends to rise as economies grow in a way that the skewness of the distribution increases: a small segment of individuals become (very) wealthy, while the income of others remains relatively stable (Chotikapanich et al., 1998). Given hierarchical preferences, greater income inequality increases the distance between consumers across the spending hierarchy $v(c(i))$. This will lower the homogeneity of consumption patterns as consumers enter new markets in a less synchronised matter. In the presence of perfectly equal income, consumers expand their spending into the same type of new markets. Low income inequality thereby helps emergence of depth in new markets, which is an essential condition to help producers overcome large fixed setup costs (Chenery et al., 1986; Murphy et al., 1989). On the other hand, high income inequality could accentuate differences in spending patterns such that marginal increases in spending are spread across

⁵Industries most affected by population size are manufacturing industries such as metals, chemicals and petroleum, paper and automobiles. A related literature on 'home market effects' suggests that countries export those goods for which there is high domestic demand Linder (1961); Hallak (2006). This is a natural corollary to the notion that a large market size fosters the division of labour

a wider range of new markets, thereby limiting the emergence of depth in those markets. In this sense, we explore the hypothesis that rising income inequality could grow demand heterogeneity by effectively polarizing the distribution of household spending of the rich and poor into different expenditure areas.

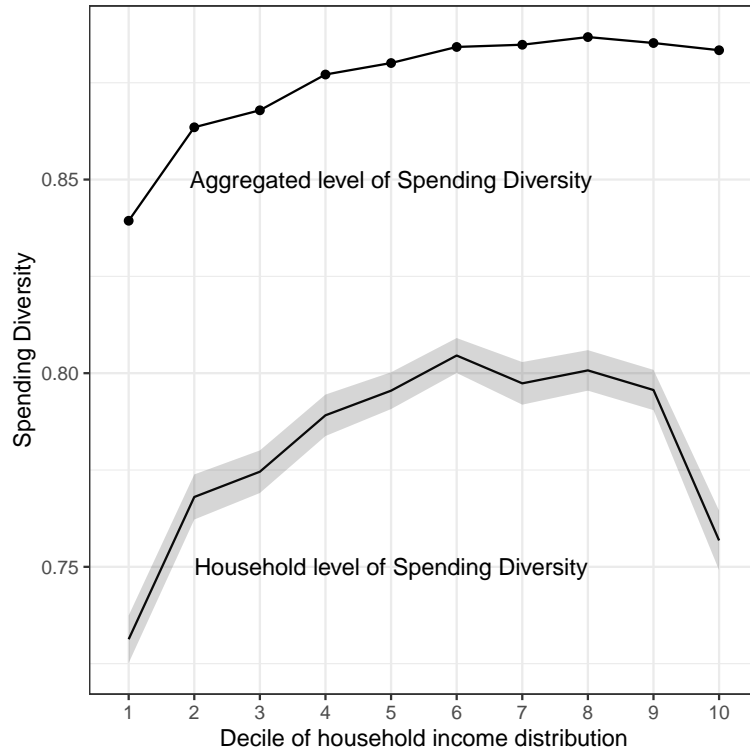
To date, a number of papers have considered the relationship between income inequality and household demand. Of these, some have examined how income inequality impact the total consumption expenditure (Krueger and Perri, 2006; Aguiar and Bils, 2015). Others consider how income-induced shifts in demand can be responsible for increasing wage inequality (Johnson, 1997; Buera and Kaboski, 2012). However, only a few studies have considered the theoretical impact of income inequality on the composition of household demand (Ibragimov and Tufetulov, 2014; Ibragimov et al., 2017). We seek to complement these by empirically investigating the relationship between income inequality and the spread of household spending across different goods and services.

2.4 Niche consumption

On the micro level, a second challenge to achieving synchronised demand growth is the observation that the homogeneity of spending patterns decline as household income rises (point 4). Differences in spending patterns emerge as affluent consumers concentrate on niche luxuries that vary from one consumer to the next (Kiedaisch et al., 2018; Neiman and Vavra, 2019). While some affluent consumers might concentrate their spending on recreational travel, others focus their spending on consuming luxury food. This fragmentation stimulates the emergence of niche markets that offer relatively customized and high quality goods that better match the tastes of consumers among smaller niche markets (Pine, 1993; Zeithaml, 1985; Cornwell and Drennan, 2004; Franke and Schreier, 2008). The coordination costs for producers subsequently increase (Murphy et al., 1989; Langois and Cosgel, 1998). For example, Foellmi and Zweimüller (2006) featured markets for differentiated goods where firms possess monopoly power.

Recently, several studies have employed spending diversity measures to track the emergence of niche consumption. Kiedaisch et al. (2018) estimate spending diversity patterns in the UK and note that there exist important differences between aggregate level and household levels results. As shown in Figure 2, while on the aggregate level spending diversity (as defined in section 4.1) is estimated to be relatively high and tends to rise at high income levels, spending diversity tends to be lower and falls on the disaggregate (household) level. This divergence occurs as affluent consumers tend to concentrate their spending on different niche areas of luxury consumption (bottom line in Figure 2). Aggregating across household in each decile, the spending diversity of the representative consumer appears to rise with income (top line in Figure 2), suggesting that affluent con-

Figure 2: Total Aggregated level of Diversity and Average households' diversity by deciles of income distribution, UK, 12 consumption categories (see section 4.1 for measurement details)



sumers possess relatively more diverse spending patterns, when in fact the reverse is true. Neiman and Vavra (2019) also examine the differences between individual and aggregate level spending patterns using scanner data on US non-service retail spending over time from 2004 - 2016. Neiman and Vavra (2019) find that individual spending diversity fell over time while spending diversity on the aggregate level rose, and that these movements can be explained by households increasingly concentrated their spending on fewer goods and increasingly purchased different products from each other.

It is worth noting that the divergence in observed spending diversity patterns on the household level and the aggregate level are an emergent property. Results on spending diversity (point 3) at the highly aggregated level should be treated with some caution when considering spending patterns of affluent consumers in developed countries.⁶ This emergent property suggests that there is an important second dimension in which rising income has an endogenous impact on consumer preferences. Not only does rising income impact the composition of demand (non-homothetic preferences), it also impacts the homogeneity of demand, i.e. how similar or different spending patterns are across a population of

⁶Studying emergent properties in aggregated data and its implication for representative agent models was a focus of Richard Day's earlier work (Day, 1963).

consumers. Whereas among low i goods at the base of the hierarchy, consumers preferences evolve in relatively homogeneous manner, the direction in which each spending patterns evolve among high i goods is more heterogeneous as each consumer chooses a more unique set of goods and services. Income rises induce the emergence of differences in the order of goods i across the population consumers.

3 Data

3.1 The Global Consumption Database

One of our main data sources is the World Bank's Global Consumption Database (GCD). The GCD provides 2011 data that covers 90 countries that are predominantly from the Least Developed and Developing world (78% of the sample). The GCD covers 107 expenditure categories, 32 of which are food and beverages, 41 are services, and the remaining 34 are goods (See Table 1).⁷ These 107 expenditure categories are also aggregated into ten larger groups: food, clothing, health, electricity, passenger transport, housing, means of communication, education, recreation, personal transport. These aggregate categories represent goods and services that are functionally similar. For example, automobiles and motorcycles both serve as means of personal transport. The GCD also provides data on participation rates: the percentage of households out of total number of households surveyed in each income segment who consume a particular good. We use this to analyze the market depth of a good in a country.

The GCD provides spending data and participation rates on the sub-national level for four income segments within each country. The segments are uniform across countries and are based on global income distribution, which ranks the global population by income per capita. The *lowest income segment* corresponds to the bottom half of the global distribution (below US\$1084.05 per capita total annual expenditure); the *low income segment* to the 51th-75th percentiles (US\$1084.05 to US\$3080.6); the *middle income segment* to the 76th to 90th percentiles (US\$3080.6 to US\$8405.95); and the *high income segment* for the 91st percentile and above (greater than US\$8405.95). For each income segment within each country, the GCD provides annualized estimates of the average household per person expenditure on a expenditure category.⁸ The data is treated to take into account imputed rents, durable goods, outliers and purchasing power parity (PPP) conversion factors.⁹ Be-

⁷Due to measurement issues, the following 5 goods and services are excluded: gambling, tobacco, narcotics, prostitution, rent.

⁸This is the estimated annualized total household expenditure on a good divided by the size of the household. It is not the total expenditure by the segment divided by the total number of household in each the segment

⁹For more details, see <http://datatopics.worldbank.org/consumption/detail>

cause the income segments are homogeneous across all countries in the data, it is possible to compare spending by income segment across different categories and countries.

A basic view of how household expenditure changes with income is provided by examining the income elasticity of goods and their participation rates. We begin on the subnational level by first calculating the budget share income elasticity of a good i observed across the four income segments b within each country c , $e_i^{c,b}$.¹⁰ The country level income elasticity e_i^c is then calculated as the weighted average of $e_i^{c,b}$. The weightings reflect the population share of b within each country. This helps to ensure that e_i^c is reflective of the national income distribution. Among Least Developed Countries (LDC) that have a large share of the population in the lowest income segment, e_i^c will predominantly reflect $e_i^{c,b}$ observed among the poorest part of national income distribution. Similarly, $p_i^{c,b}$ is the income elasticity of the participation rate at the income segment level and p_i^c is the country level weighted average of $p_i^{c,b}$.

The top panel of Figure 3 displays the budget share Engel curves for shoes and recreational & sporting services in Brazil. The vertical gray lines indicate b . The points report the average annualized per capita budget share household expenditure for each b . The Engel curve budget share declines with income, while it rises for recreational services. The e_i^c for shoes is -0.11 which is a weighted average of the three $e_i^{c,b}$ (values are reported in the note below the Figure). In the case of recreational services, while the slope of the Engel curve is positive and steep, the e_i^c is 0.89 . This relatively low value is due to Brazil's population being located at the bottom two income segments. The $e_i^{c,b}$ for these segments (0.26) receives a relatively large weighting in e_i^c . In a similar fashion, we calculate the income elasticity of participation rates (see bottom panel of Figure 3). A relatively large percent of the Brazil population consumes shoes ($p_i^c = 0.06$). The participation rate of recreational services is low among the poor, but rises quickly among richer b . This is reflected in $p_i^c = 1.29$ for recreational services. In general, low values for p_i^c indicate that a good is widely consumed across all b , while high values indicate that a good is only among richer income segments in the country.

Averaging e_i^c and p_i^c across all countries, Table 1 reports the estimated global income elasticities of expenditure budget shares (e_i) and participation rates (p_i). These are ranked by their estimated global income elasticity. It shows that starchy foods (cereal and pota-

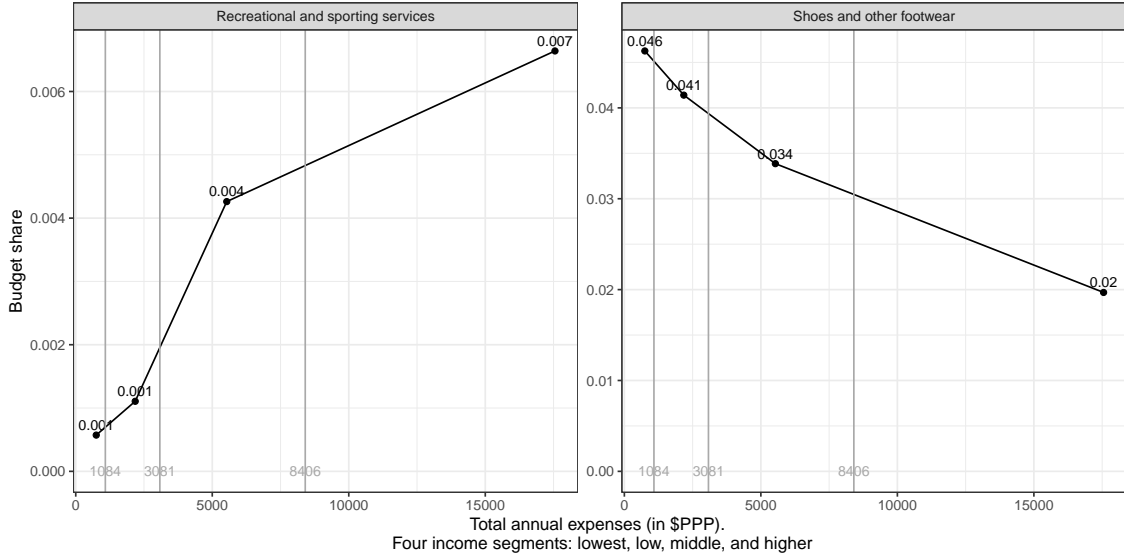
¹⁰This is the percent change in budget share of i , s_i , divided by the percent change in total expenditure, E . For example, $e_i^{b=low}$ and $e_i^{b=high}$ will be:

$$e_i^{b=low} = \frac{\frac{s_i^{b=low} - s_i^{b=lowest}}{s_i^{b=lowest}}}{\frac{E_i^{b=low} - E_i^{b=lowest}}{E_i^{b=lowest}}} \quad e_i^{b=high} = \frac{\frac{s_i^{b=high} - s_i^{b=middle}}{s_i^{b=middle}}}{\frac{E_i^{b=high} - E_i^{b=middle}}{E_i^{b=middle}}}$$

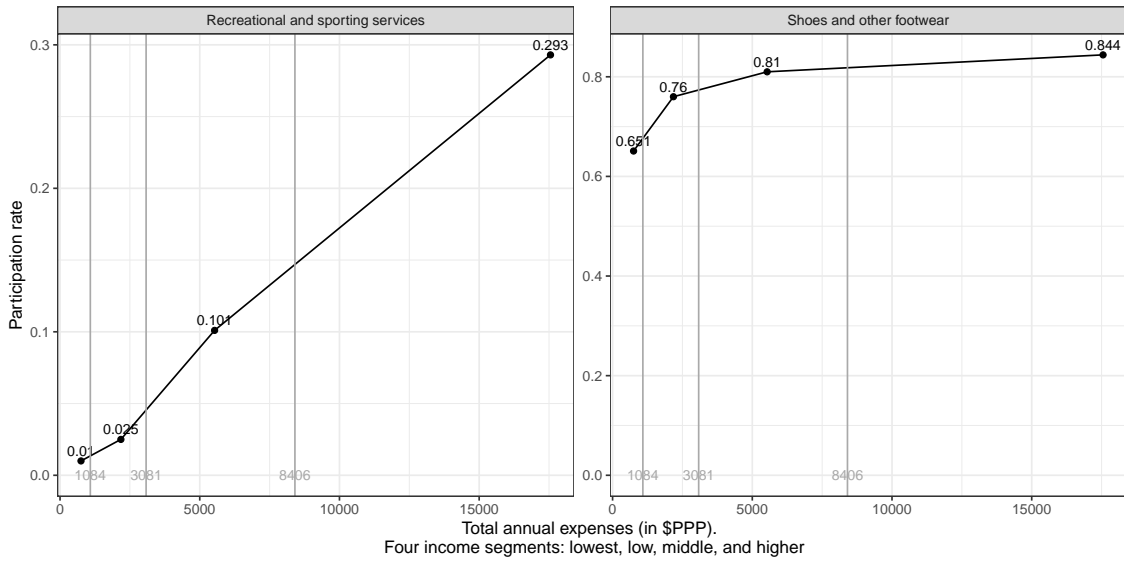
toes) possess the lowest e_i^c among all goods, while motor cars have the highest e_i^c . The estimated global income elasticities are consistent with existing empirical studies that show that food categories possess relatively low e_i , while service categories possess relatively high e_i (Lebergott, 2014; Clements et al., 2006; Chai and Moneta, 2012). The Table shows that p_i are relatively low for low e_i , similar to case of shoes in Brazil. This is because a large share of the lowest income segment consume basic necessities that possess a low e_i . p_i are much large among luxuries e_i , suggesting that these are goods enter the consumption basket among higher income segments. This confirms the basic tendency for the basket of goods consumed to expand as household grow rich and begin to consume luxury goods.

Figure 3: Budget share Engel curves for recreational service and shoes in Brazil

(a) Budget shares



(b) Participation rates



Note: The e_i^c for recreational services in Brazil is $e_i^c = 0.89$, which is the weighted average of the three income elasticities calculated across the four segments: 0.49, 1.85, 0.26. The income elasticity of the participation rate for recreational services in Brazil is $p_i^c = 1.29$, which is the weighted average of 0.78, 1.97, 0.87. The e_i^c for Shoes is $e_i^c = -0.11$, which is the weighted average of -0.055 , -0.12 , -0.19 . The income elasticity of the participation rate for Shoes is $p_i^c = 0.06$, which is the weighted average of 0.09, 0.04, 0.02.

Table 1: Global Income elasticities of consumption budget shares and participation rates

Consumption category	Sector	Index-Number for Elasticity	Average	St.deviation	Index-Number for Participation rate	Average	St.deviation
Other cereals, flour and other products	food	1	-0.269	0.116	1	0.012	0.076
Fresh or chilled potatoes	food	2	-0.207	0.15	8	0.077	0.152
Sugar	food	3	-0.201	0.142	7	0.055	0.147
Rice	food	4	-0.2	0.154	10	0.09	0.205
Other Edible Oil and Fats	food	5	-0.179	0.16	5	0.048	0.129
Fresh or chilled vegetables other than potatoes	food	6	-0.161	0.09	2	0.014	0.046
Food Products n.e.c.	food	7	-0.147	0.107	3	0.019	0.071
Other fuels	products	8	-0.126	0.423	6	0.054	0.378
Coffee, tea and cocoa	food	9	-0.082	0.216	15	0.152	0.283
Vegetables and Vegetable-based Product	food	10	-0.023	0.699	19	0.176	0.351
Preserved or processed fish and seafood	food	11	0	0.355	28	0.279	0.476
Other bakery products	food	12	0.006	0.273	24	0.23	0.276
Fresh or chilled fruit	food	13	0.02	0.193	16	0.16	0.209
Poultry	food	14	0.027	0.297	29	0.284	0.44
Bread	food	15	0.039	0.433	32	0.31	0.46
Non-durable household goods	products	16	0.047	0.932	4	0.042	0.187
Pharmaceuticals Products	products	17	0.048	0.267	11	0.103	0.137
Fresh milk	food	18	0.048	0.503	38	0.346	0.681
Other meats and meat preparations	food	19	0.052	0.301	25	0.261	0.315
Pasta products	food	20	0.052	0.761	61	0.549	1.41
Shoes and other footwear	products	21	0.061	0.245	13	0.115	0.16
Fruit and Fruit-based Product	food	22	0.062	0.436	41	0.362	0.698
Appliances for personal care	products	23	0.065	0.218	9	0.087	0.181
Small tools and miscellaneous accessories	products	24	0.07	0.315	20	0.185	0.269
Fresh, chilled or frozen fish and seafood	food	25	0.076	0.416	36	0.333	0.535
Garments	products	26	0.078	0.262	12	0.112	0.197
Eggs and egg-based products	food	27	0.089	0.489	39	0.358	0.505
Clothing Material and Clothing Accessories	products	28	0.095	0.367	18	0.176	0.262
Spirits	food	29	0.134	0.453	33	0.323	0.597
Preserved milk and other milk products	food	30	0.158	0.456	49	0.444	0.679
Lamb, mutton and goat	food	31	0.16	0.645	34	0.326	0.486
Beef and veal	food	32	0.184	0.49	48	0.418	0.539
Repair and hire of footwear	service	33	0.188	0.297	62	0.558	0.693
Confectionery, chocolate and ice cream	food	34	0.191	0.559	44	0.386	0.498
Glassware, tableware and household utensils	products	35	0.197	0.977	22	0.208	0.306
Passenger transport by road	service	36	0.198	0.507	23	0.208	0.218
Pork	food	37	0.201	0.65	42	0.38	0.729

Global Income elasticities of consumption budget shares and participation rates

Consumption category	Sector	Index-Number for Elasticity	Average	St.deviation	Index-Number for Participation rate	Average	St.deviation
Butter and margarine	food	38	0.236	1.069	64	0.584	1.048
Newspapers, books and stationery	products	39	0.254	0.638	26	0.267	0.688
Hairdressing salons and personal grooming establishments	service	40	0.258	0.314	35	0.33	0.351
Paramedical services	service	41	0.268	0.553	43	0.383	0.653
Water Utility	service	42	0.298	0.552	70	0.673	1.443
Other Purchase Transport Services	service	43	0.312	1.3	31	0.296	0.372
Animal drawn vehicles	products	44	0.312	0.727	17	0.172	0.619
Household textiles	products	45	0.322	0.604	45	0.389	0.608
Other medical products	products	46	0.328	1.42	37	0.336	0.432
Medical Services	service	47	0.332	0.954	40	0.359	0.558
Wine	food	48	0.379	0.887	58	0.54	0.928
Passenger transport by sea and inland waterway	service	49	0.388	0.986	27	0.276	0.441
Other personal effects	products	50	0.403	0.517	55	0.487	0.499
Veterinary and other services for pets	service	51	0.405	0.562	57	0.529	0.876
Mineral waters, soft drinks, fruit and vegetable juices	food	52	0.419	0.839	60	0.547	0.69
Other Services n.e.c.	service	53	0.426	0.519	52	0.458	0.488
Dental services	service	54	0.436	0.562	54	0.469	0.498
Hospital services	service	55	0.437	0.909	30	0.293	0.493
Maintenance and repair of other major durables for recreation	service	56	0.444	0.814	21	0.205	0.464
Jams, marmalades and honey	food	57	0.448	0.84	83	0.916	1.245
Beer	food	58	0.464	1.246	68	0.667	1.196
Electricity	products	59	0.483	1.373	82	0.914	1.829
Repair of Audio/Visual/Photo/Information Process Equipment	service	60	0.499	0.604	77	0.805	1.525
Cheese	food	61	0.51	1.207	81	0.909	1.428
Cleaning, repair and hire of clothing	service	62	0.532	1.155	63	0.561	0.769
Other recreational items and equipment	products	63	0.574	0.674	65	0.592	0.625
Gas	products	64	0.59	1.093	87	1.058	1.616
Small electric household appliances	products	65	0.615	0.769	93	1.25	2.284
Carpets and other floor coverings	products	66	0.634	0.855	75	0.762	0.987
Telephone and telefax equipment	products	67	0.644	1.286	78	0.829	0.908
Jewellery, clocks and watches	products	68	0.651	0.646	59	0.54	0.523
Combined passenger transport	service	69	0.652	1.473	46	0.414	0.502

Global Income elasticities of consumption budget shares and participation rates

Consumption category	Sector	Index-Number for Elasticity	Average	St.deviation	Index-Number for Participation rate	Average	St.deviation
Catering Service	service	70	0.713	2.407	50	0.446	0.631
Maintenance and repair of the dwelling	service	71	0.745	0.855	51	0.455	0.563
Miscellaneous services relating to the dwelling	service	72	0.749	1.328	97	1.354	2.402
Postal services	service	73	0.775	1.284	85	0.969	1.023
Furniture and furnishings	products	74	0.781	0.96	66	0.609	0.889
Therapeutic appliances and equipment	products	75	0.781	1.036	73	0.713	0.752
Major tools and equipment	products	76	0.808	2.794	47	0.415	0.552
Education	service	77	0.812	2.501	14	0.116	0.304
Telephone and telefax services	service	78	0.824	2.611	72	0.689	1.099
Audio/visual/photo/information processing equipment	products	79	0.835	1.749	56	0.527	0.53
Social protection	service	80	0.9	1.633	67	0.661	0.941
Recording media	products	81	0.95	1.275	92	1.21	1.186
Bicycles	products	82	0.959	2.555	71	0.673	1.725
Cultural services	service	83	0.976	1.502	88	1.061	1.373
Major household appliances whether electric or not	products	84	1.014	1.503	79	0.854	0.991
Passenger transport by railway	service	85	1.045	4.602	53	0.461	0.805
Major durables for outdoor and indoor recreation	products	86	1.16	2.214	69	0.669	0.847
Household services	service	87	1.176	1.811	90	1.111	1.414
Repair of furniture, furnishings and floor coverings	service	88	1.197	2.109	76	0.78	0.967
Repair of household appliances	service	89	1.217	3.192	84	0.925	0.94
Recreational and sporting services	service	90	1.297	1.711	94	1.268	1.632
Other Financial Services n.e.c.	service	91	1.488	2.876	91	1.128	1.378
Motor cycles	products	92	1.6	3.764	80	0.909	1.347
Accommodation services	service	93	1.641	1.819	96	1.279	1.091
Insurance	service	94	1.688	2.573	98	1.435	1.777
Maintenance and Repair of Personal Transport Equipment	service	95	1.706	2.836	89	1.09	1.141
Garden and pets	products	96	1.807	9.103	74	0.727	0.766
Fuels and lubricants for personal transport equipment	products	97	2.021	2.735	99	1.473	1.596
Other services in respect of personal transport equipment	products	98	2.334	4.253	100	1.772	1.794
Passenger transport by air	service	99	3.131	6.198	95	1.278	1.941
Package holidays	service	100	4.151	15.835	86	1.054	0.949
Domestic services	service	101	4.805	6.775	102	3.075	3.03
Motor cars	products	102	8.041	17.915	101	2.828	3.897

3.2 Other Data

To calculate spending diversity for a larger set of countries, we also employ data sourced from the World Bank 2011 International Comparison Program (ICP). It covers 180 countries and contains country level expenditure on the same 107 expenditure categories used in the GCD¹¹. The sample of countries in the ICP contains a larger number of developed countries, compared to the GCD that is more focused on developing countries. The average log GDP per capita in the GCD sample is 7.7, while it is 9.7 for countries present in ICP and missing in GCD.

For the analysis of niche markets (section 5.3), we use more disaggregate household level data sources from three countries: UK, Malawi and South Africa. These were chosen in order to compare household level spending patterns from different parts of the global income distribution as the UK is a developed economy (GDP per capita around US\$42,000 in 2011 and a Gini coefficient of 33%). Malawi is among LDC (GDP per capita around US\$500 and Gini coefficient of 45%). South Africa represents one of the affluent developing economies and the most unequal ones (GDP per capita around US\$8,000 and Gini coefficient of 63%). In terms of four income segments used in the GCD, more than 90% of UK population belongs to the *high income segment*, while in Malawi, on the opposite, more than 90% of population belongs to the *lowest income segment*, and in South Africa 40% belong to the *lowest income segment* and 21% - to the *high income segment*.

	UK	South Africa	Malawi
Survey title	Living Cost and Food Survey	Income and Expenditure Survey	Third Integrated Household Survey
Sample size	5,691	25,328	12,271
Number Expenditure categories	12	752	35
Year of the survey	2011	2013	2011

Country level statistics on GDP per capita, inequality, urbanization rates, size and population was sourced from the World Bank. The CEPII gravity dataset was used to sourced data on geographical distance between countries, colony-colonizer relationships (Mayer et al., 2014).

4 Methodology

4.1 Spending Diversity

We measure the broad manner in which households diversify their spending across goods across different levels of affluence. On the macro level, GDP is used as a proxy for the economies overall level of affluence. On the micro level, household income is used

¹¹We do not report in the Tables on 5 goods: Games of chance, Tobacco, Narcotics, Prostitution, Rent

as measure of individual level affluence. Entropy measures are calculated to track the dispersion of household spending across different goods, which we dub the ‘diversity of spending’ (Theil, 1967; Clements et al., 2006; Clements and Gao, 2012). Using the Gini-Simpson (GS) measure, spending diversity in country c is:

$$D^c = \sum_{i=1}^{N^c} s_i^c(1 - s_i^c) \quad (2)$$

where s_i is budget share of good i in total consumption expenditure and N^c is an indicator of the number of goods consumed in country c (calculated as indicated below).¹² If expenditure is spread perfectly evenly across all goods such that $s_1^c = s_2^c = \dots = s_{N^c}^c$, this would correspond to maximum D^c spending diversity. If expenditure is highly concentrated into certain goods, this corresponds to a low value for D^c , with a minimum value of 0.

Spending diversity can grow through two different channels. It can grow as the relative size of spending shares across a given set of goods becomes more even. We call this the intensive margin. Given an economy composed of a single consumer who only consumes two goods, if the consumer switches from spending their total budget on one good to a situation where they spend equal share on both goods, then D^c reaches its maximum. To make valid comparisons between the growth rates of spending diversity across food, goods and services, we need to take into account that number of varieties consumed within each of these sectors in each country is different. Therefore, in each country we normalize spending diversity to control for the differences in the number of varieties consumed within food, goods and services.

Spending diversity can also grow via a change in variety of goods consumed. We label this the extensive margin and study it on the economy level using the indicator of the number of varieties. The indicator for a variety in a country is 1 if country’s consumption expenditure exceeds 1% of maximum budget share observed across the world (Falkinger and Zweimüller, 1996). For example, in the case of cereals, the maximal budget share is 59% (observed in Ethiopia). In 172 of the 180 ICP countries the budget share of cereals exceeds 0.59%. For each good and each country the indicator of variety consumption is then:

$$N_i^c = \begin{cases} 1 & \text{if } s_i^c > 0.01 \max_c(s_i^c) \\ 0 & \text{else} \end{cases}$$

The measure of the extensive margin in an economy is then:

¹²Note that there exist a number of diversity measures, including the Herfindahl-Hirschman index. Chai et al. (2015) discuss the various measures and find that the choice of index has a negligible impact on results.

$$N^c = \sum_{i=1}^{107} N_i^c$$

107 represents the number expenditure categories available in the ICP data. The ICP data is used in this instance to capture a wider range of countries distributed across the global income distribution. To study how income inequality tends to desynchronise consumer spending, a OLS regression is then employed to examine how N^c is correlated with GDP per capita and income inequality (Gini index), as well as an interaction term (Gini \times log GDP per capita). The parameter estimate for GDP per capita is expected to be positive. The main hypothesis is that income inequality desynchronizes spending on new varieties as economies grow. We therefore expect the interaction term to have a negative impact on the extensive margin. Control variables include (log) population of a country, (log) area of a country, urbanization rate.

4.2 Niche Consumption

To track the growth of niche consumption Kiedaisch et al. (2018) and Neiman and Vavra (2019), equation 2 is used to measure the diversity of spending of representative households on a more aggregate level using household level expenditure data from various countries sampled across the developed and developing world (Malawi, South Africa and the UK). Aggregating household level spending and income data into deciles and quintile level, the diversity of spending for each decile is calculated. We denote D_a for the diversity of spending that is observed on the aggregate level. D_{hh} the diversity of spending that is observed on the household level hh :

$$D_a = \overline{D_{hh}} \quad \text{where } hh \in a$$

4.3 Market Depth

We use GCD data on the national participation rates to study cross country variation in market depth and its relationship to income and income inequality. A simple OLS regressions is employed to study the correlation between the participation rates of goods where log GDP per capita and the Gini coefficient are specified as independent variables. Using the global income elasticities reported in Table 1, we consider how the relationships differ across low i and high i goods. GDP per capita is expected to be positively correlated to market depth among luxuries as higher incomes stimulate consumer to enter new markets and deepen participation rates for luxury good (high i goods). Concerning the Gini coefficient, the hypothesis that income inequality desynchronizes spending diversity suggests

that the Gini is will be negatively correlated with market depth, especially among higher order luxuries. Economy level control factors include (log) population of a country, (log) area of a country, urbanization rate.

4.4 Expenditure Hierarchies

To characterize the hierarchy of preferences, for each country we examine the order of e_i^c and p_i^c across goods for the ten aggregate groups of expenditure (discussed in the previous section).¹³ The hierarchy of expenditure in a given country is constructed following the procedure below. If in a country c income elasticity of expenditure group j is higher than of group i , $e_j^c > e_i^c$, then expenditure group j ranks higher than group i in the preference hierarchy in country c , $g_j \succ g_i$.

This approach enables us to study both the relative rank of a good across the expenditure hierarchies of different countries, as well as cross country differences in expenditure hierarchies. Concerning the former, comparing the relative rank of good in the expenditure hierarchy is quite different from comparing the income elasticities of goods across countries. For example, even though there may be strong cross country differences in the value of income elasticities for certain goods, the extent to which the good is a luxury relative to other goods may be stable. For example, even though e_i^c for automobiles may fluctuate across countries (see Table 1), the rank of automobiles as the premier luxury good in the preference hierarchy of countries may be stable. We define stability as the condition in which the average cross-countries elasticity of expenditure group j is higher than of group i , $\bar{e}_j > \bar{e}_i$, (i.e., $j < i$, and in matrix terms it is lower left matrix triangle) then $e_j^c \geq e_i^c$ in the majority of countries.

To study the path dependent nature of expenditure hierarchies, we measure cross country differences between expenditure hierarchies. For any pair of countries (c_i, c_j) this is done by measuring the Euclidean distance – $d(c_i, c_j)$. This is a measure of dissimilarity: the bigger is the distance, the more different are their expenditure hierarchies of c_i and c_j . Figure 10 in the Appendix reports the distribution of the distance between expenditure hierarchies. There are a total of $N = 2830$ pairwise comparisons of expenditure hierarchies. The largest distances are observed in the distance between the expenditure hierarchies between rich and poor countries (e.g. distance between Romania and Togo or Latvia and Rwanda). Country pairs with relatively low distances between expenditure hierarchies include Malawi and Uganda. We then employ a gravity model (Eaton and Kortum, 2002; Anderson and Van Wincoop, 2003) to regress the observed distance between expenditure hierarchies ($-d(c_i, c_j)$) on the difference in GDP and proxies for similarities

¹³Appendix provides results using 107 consumption categories showing that our conclusions are robust to disaggregation.

in national institutions and culture. Note that this model includes fixed effects to denote dummies that are included each time country i in the regression (Anderson and Van Wincoop, 2003). Concerning the influence of GDP on expenditure hierarchies, the Linder Hypothesis predicts that spending patterns are more similar among countries with similar levels of wealth Linder (1961); Hallak (2006). We therefore include differences in income levels measured by logarithm of GDP per capita ($|\ln(y_i) - \ln(y_j)|$). This is expected to be negatively correlated to distance as countries with similar incomes are more likely to have similar expenditure hierarchies.

To investigate path dependence, we consider how common institutions and historical processes have generated similarities in expenditure hierarchies observed across countries. Studies suggest that proxies for institutional similarities include the movement of trade, people and capital across countries (Acemoglu et al., 2005), as well as historical colonizer relationships (Acemoglu et al., 2001). Geographical distance is used as a proxy for the former. The distance between two countries is calculated using the bilateral distances between the biggest cities of those two countries, with those inter-city distances being weighted by the share of the city in the overall country's population (Mayer and Zignago, 2011). For colonizer relationships, there are 16 countries in the dataset that were former colonies of France, and 19 countries were former colonies of the UK. We also include religion, language and a proxy to capture the recent (post 1945) fragmentation of countries.¹⁴ Control variables include: the Gini coefficient, urbanization rates, the geographical mass and population size.¹⁵

5 Results

5.1 Results for Spending Diversity and Market Depth

We begin by considering the relationship between spending diversity and income. Figure 4 shows the Engel Curve for spending diversity. There is an overall positive correlation between log GDP per capita and spending diversity. Spending diversity appears to grow quickly as countries grow rich at low levels of GDP. Among relatively poor countries in which a large share of the population is located in the lowest income segment, household expenditure remains relatively concentrated on food (e.g. Burundi and Ethiopia). In countries that possess a relatively larger middle class population (e.g. Kenya, Zambia and Vietnam) further increases in log per GDP per capita tend to deliver relatively smaller

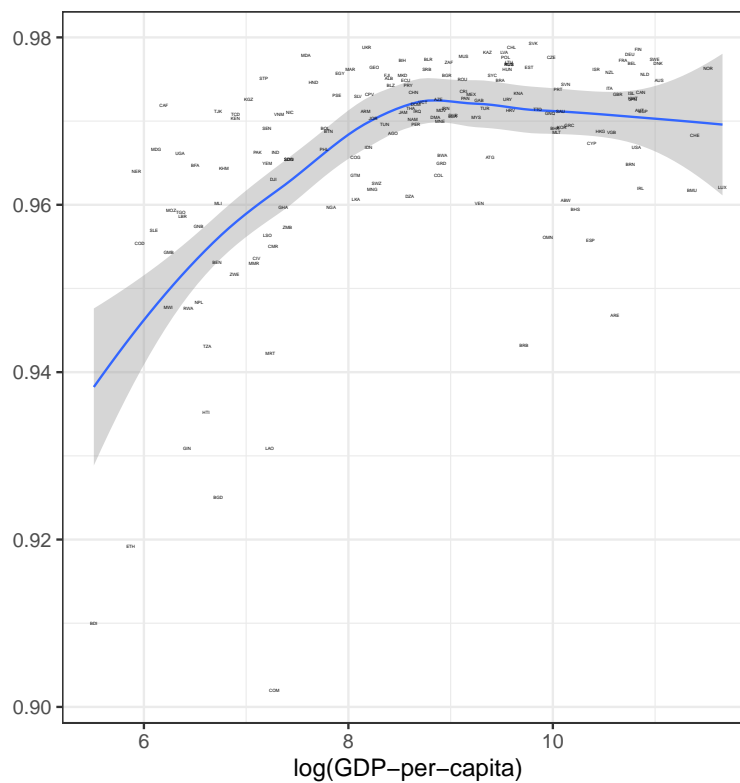
¹⁴A number of countries fragmented in recent history due to civil unrest or other reasons. Examples include Bangladesh becoming independent from Pakistan in 1972, Namibia becoming independent from South Africa in 1990, and the dissolution of the USSR in 1991.

¹⁵Results are valid when the control variables are omitted.

risers in total spending diversity.

There is some evidence that the relationship between spending diversity and GDP is nonlinear at higher levels of GDP. While the curve appears to flatten out at high income levels, this should be treated with caution as a handful of relatively affluent countries with unusually low levels of spending diversity impact this result. These countries include Barbados (BRB), Oman (OMN), Emirates (ARE) and Spain (ESP). Spending on motor cars in Oman and Emirates appears to be unusually high. In both countries, the average per capita household budget share dedicated to motor cars is more than 14%, while the cross-countries average in the ICP dataset is 3%. In the case of Barbados and Spain, the average budget share dedicated to catering services and accommodation services (including restaurants, cafes etc) is above 20%, which is relatively high.

Figure 4: Diversity of consumption vs per capita income, ICP data

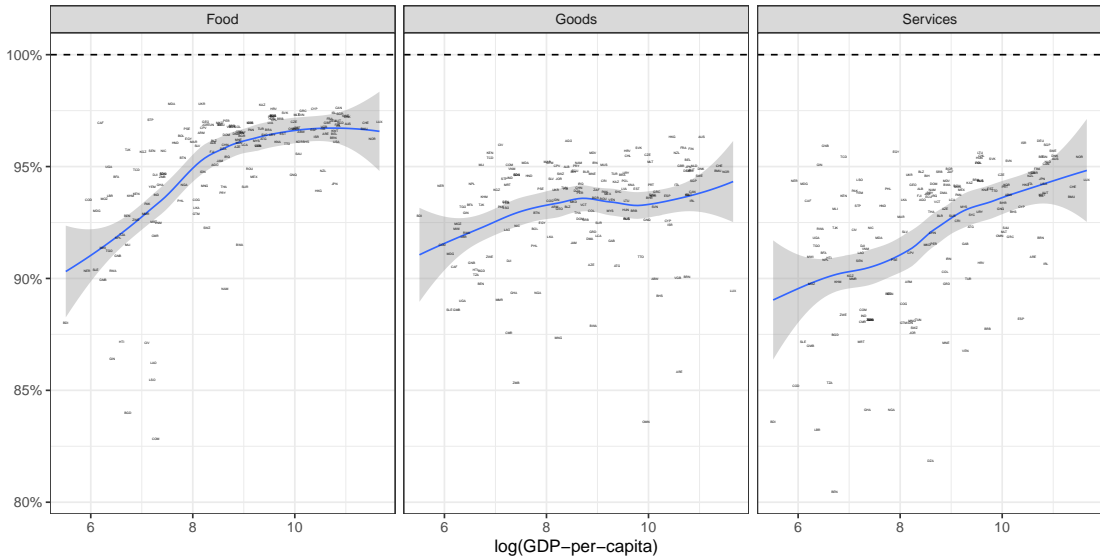


Note: The grey area represents the 95% confidence interval around the kernel regression.

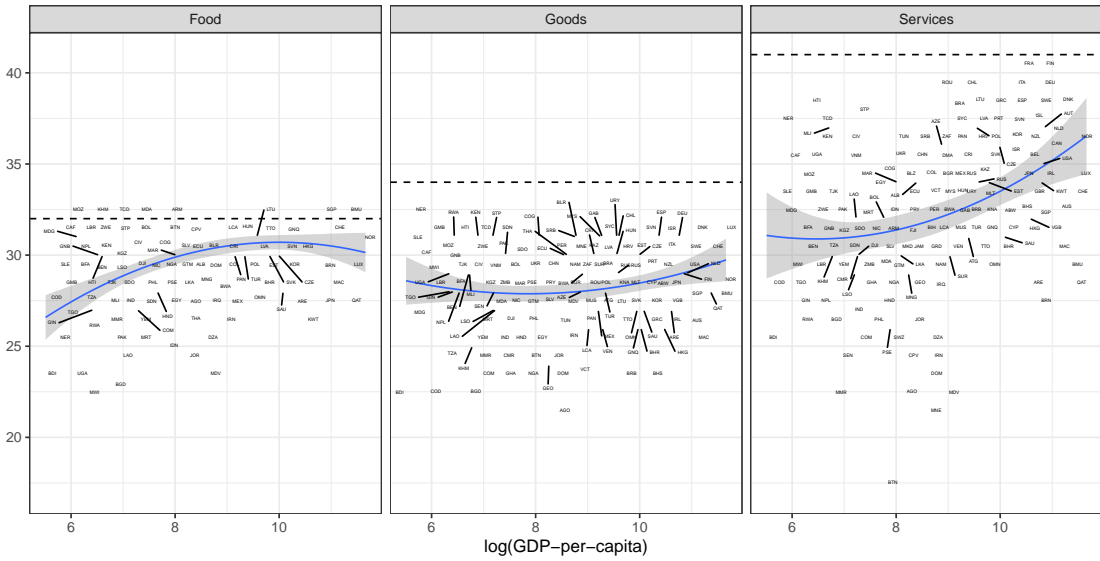
This increase in spending diversity brings about fundamental shifts in the composition of demand. The bottom panel of Figure 5 indicates that spending diversity grows as income rises via a decline in the budget share of spending dedicated to food (Engel's law) and an increase in the budget share dedicated to both goods and services. This is consistent with the observation that expenditure on services is rapidly rising among developed economies (Buera and Kaboski, 2012; Boppart, 2014).

Figure 5: Diversity of consumption vs per capita income, ICP data

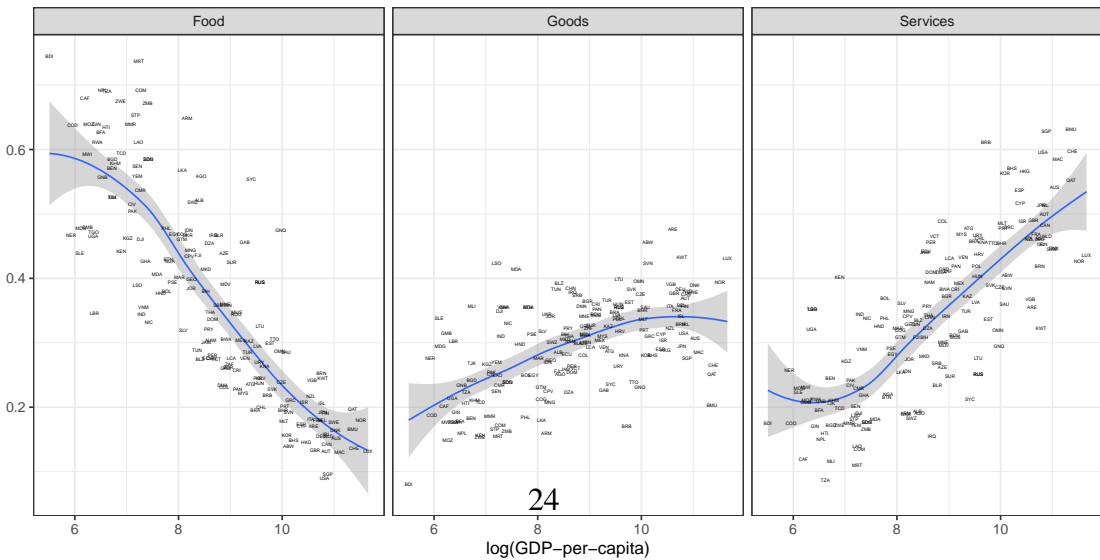
(a) Intensive margin



(b) Extensive margin



(c) Budget shares



Concerning the intensive and extensive margin, while both tend to rise with income, this growth is located in different broad areas of expenditure (food, goods and services). Figure 5 show how consumers diversify their spending by both expanding the variety of goods consumed (extensive margin growth) and distributing their spending more evenly across existing goods (intensive margin growth). Among LDCs, spending diversity mainly grows via an increase in the intensive margin of food expenditure. Figure 5 (top left panel) shows that the intensive margin of food is very responsive to rising levels of income. This is consistent with studies of variety demand in food (Clements and Si, 2018) and suggests that even though the overall budget share of food declines as consumers get rich affluent, they tend to spend more on luxury foods, such as wine, cheese, honey (see their income elasticities in Table 1 relative to other food categories). Low income household still do consume small amounts of these goods (Banerjee and Duflo, 2007), which is why diversity in such case grows due to the intensive margin.

The middle panel of Figure 5 compares the growth of the extensive margin across food, goods and services. The dotted line represents the maximum number of varieties in each category (32 in food, 34 in goods, 41 in services). Regression results in Table 2 confirm that income is positively and significantly correlated with the extensive margin. The parameter estimate of 2.3 (regression 1) suggests that a 1% increase in log GDP per capita is associated with an increase in the extensive margin by 2.3 varieties consumed. However, the magnitude of this effect varies significantly across food, good and services. The extensive margin of food and goods appear to be relatively less responsive to rising income as a large number of varieties of both food and goods are already consumed at low levels of log GDP per capita (see regressions 2 and 3 in Table 2). For goods, some of the types of goods that account for an increase in the extensive margin include: furniture, recreational equipment and pet expenditure.

One possible explanation for the relative flat rise in the extensive margin of goods could be due to economic growth stimulating qualitative changes in the basket of good consumed in which higher quality goods replace inferior varieties. If consumers in developing countries use bicycles, while consumers in rich countries substitute away from bicycles away towards motorbikes, the overall number of goods consume goods will remain constant. However, this explanation is not consistent with p_i^c in Table 1, which show that participation rates for all goods and service tend to rise. There are no cases in which p_i^c is negative.

The extensive margin of services does appear to be relatively more responsive to income increases. A growth of GDP per capita by 1% is associated with consumption of 1 more service variety (regression 4 Table 2). Many types of services are not consumed at low levels of GDP per capita, but only enter the basket at higher levels of GDP per capita.

Table 2: Regression results for the cross country Extensive margin of diversity, ICP data

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<i>Dependent variable:</i> Extensive margin	Total	Food	Goods	Services	Total	Food	Goods	services
<i>log</i> GDP per capita	2.279*** (0.578)	0.486*** (0.151)	0.199 (0.181)	0.813*** (0.295)	5.254*** (1.606)	0.957* (0.529)	1.298** (0.529)	2.673*** (0.779)
Inequality	-0.0641 (0.0576)	0.0294 (0.0178)	-0.0183 (0.0162)	-0.0800** (0.0310)	0.651* (0.361)	0.143 (0.124)	0.246** (0.121)	0.367** (0.178)
Interaction term: Inequality \times <i>log</i> GDP per capita					-0.0796** (0.0377)	-0.0126 (0.0130)	-0.0294** (0.0129)	-0.0498*** (0.0186)

Robust standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Source: ICP Data. The full regression, including control variables is given in the appendix (Table 5).

One reason for this trend is that some services rely on the provision of public infrastructure, which is usually positively correlated with GDP. For example, the consumption of telephone services and public transport services (trains and buses) depends on the state provision of telecommunication and road infrastructure. These are more scarce in less developed countries. In other cases, the extensive margin grows in services that offer relatively specialized and customized experiences to the individual tastes of consumers Buera and Kaboski (2012). For example, one prominent type of service that affluent consumer diversify into is cultural services. This includes subscriptions to cable, satellite and other program distribution services, visits to cinemas, theaters, museums, zoos, libraries.

Regarding the impact of inequality, the results in Table 2 show that income inequality is negatively correlated with the extensive margin in services. *Ceteris paribus* consumers located in countries exhibiting greater income inequality consume a lower variety of services. For a 12.5% rise in the Gini coefficient, the average number of varieties consumed by the population of consumers reduces by one unit (regression 4 Table 2, 1% / -0.08 = 12.5%). In terms of how the hypothesis that income inequality desynchronizes spending patterns as economies grow, the interaction term between inequality and GDP reveals that what impact inequality has on the extensive margin is conditional on GDP per capita. In poorer economies where the *log* GDP per capita is below 8.17 (equivalent to Armenia), income inequality has a positive impact on the extensive margin. If *log* GDP is 5.5, the effect of 1% increase in inequality is an increase of extensive margin by 0.21 (0.651-0.0796 \times 5.5 = 0.21). At high GDP levels, the impact of inequality switches to being negative. When *log* GDP per capita is 11 (equivalent to Australia), a 1% increase in the Gini coefficient leads to a decrease in the extensive margin by -0.22 (0.651-0.0796 \times 11 = -0.22). This result suggests that among rich countries, higher levels of income inequality tends to reduce the number of varieties consumed.

Table 3 reports the results on market depth. p_i^c is found to be positively and significantly correlated with GDP per capita: the average market depth is higher among richer

Table 3: Regression results for market depth (p_i^c)

	(1)		(2)	
<i>log</i> GDP per capita	6.121***	(0.448)	6.121***	(0.448)
Inequality	-0.562***	(0.0468)	-0.664***	(0.0590)
e_i	-10.02***	(0.415)	-16.02***	(2.270)
Interaction term: Inequality $\times e_i$			0.154***	(0.0554)

Robust standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

The dependent variable is the share of the population in each country that consumes a particular good.

Source: GCD data. The full regression, including control variables is given in the appendix (Table 6).

countries. The Gini coefficient is negatively and significantly correlated with market depth (p_i^c). This supports the hypothesis that rising income inequality tends to reduce the depth of markets. Market depth is also inversely correlated to the global income elasticity of the good (e_i , reported in Table 1). The average market depth found within a country is relatively lower among luxuries (high order i), while necessities (low order i) possess relatively greater market depth. The interaction term between the Gini coefficient and e_i is positively and significantly correlated with p_i^c . This suggests that the Gini coefficient moderates the overall impact of e_i on p_i^c . The relative decline in market depth among luxuries is lower among countries experiencing high levels of income inequality. This suggests higher income inequality generates a large share of affluent consumer that begin to consume luxuries.¹⁶

5.2 Results for Expenditure Hierarchies

We now turn to examine similarities and differences in the expenditure hierarchies across countries. Considering the expenditure hierarchy in each country, each cell in Figure 6 reports the frequency that the income elasticity of the good estimated at the country level (e_i^c) listed in the column is ranked above or equal to income elasticity of the good listed in the row (e_j^c). The goods are ordered according to their global income elasticity, \bar{e} . A matrix element $\{i, j\}$ is the percentage of cases across all countries when the income

¹⁶Consider some examples: When e_i is 1, the effect of a 1% increase in inequality is a decrease in p_i^c by 0.51 ($-0.664 + 0.154 \times 1 = -0.51$). When e_i is 2, the effect of a 1% increase in the Gini coefficient is the decrease in p_i^c by 0.36 ($-0.664 + 0.154 \times 2 = -0.36$).

elasticity of good j is higher (or equal to) good i , $e_j^c \geq e_i^c$.¹⁷ The matrix is symmetric and the sum of elements $\{i, j\}$ and $\{j, i\}$ is 1.¹⁸ For example, across all countries in our sample, the income elasticity of food (bottom row) is lower than the income elasticity of personal transport (first column). The matrix shows that in 90% of countries, the income elasticity value of electricity (column 7) is higher than of food. Consequently, electricity ranks above food in the expenditure hierarchy in 90% of the countries.

The results indicate that there is a remarkable level of stability in the expenditure hierarchies observed across countries. The values of cells located around the perimeter of the matrix are close to either boundary value of zero (top right triangle) or one (bottom right). On the other hand, the values of cells located closer to the middle of the matrix tend to be closer to 0.5. This result shows that there is relative homogeneity in the base of the expenditure hierarchy across countries as food always possesses a lower income elasticity, relative to personal transport. At the same time, the ranking of expenditure hierarchies for higher order goods appears to be much more heterogeneous across countries. In terms of robustness, we report in the appendix similar results using 107 expenditure categories (see Figure 9).

The lower values around the centre of the matrix indicate that cross country differences in expenditure hierarchies are relatively greater among luxuries, high i goods. For example, in the case of education (row 3) and housing (column 5), the income elasticity of housing is greater than education in 40% of countries. Likewise, the income elasticity of health expenditure is greater than the income elasticity of passenger transport in 40% of all countries. This variation is likely to reflect differences in institutional differences in the public provision of physical infrastructure and social services. For example, in countries where the public provision of health services is high, it is likely that this will crowd out private expenditure and the income elasticity for health services will be relatively lower. In countries where government provision of health care service is low, it is likely that affluent consumers will spend more on these services. This is likely to occur across a range of expenditure categories including: health, education, transport and telecommunications. The overall results suggest that cross country differences in consumption patterns grow as economies develop and consumer spending moves to the high i order of goods.

Further evidence for spending patterns becoming more heterogeneous among higher order i goods can be seen by examining how the income elasticity of goods vary across countries (as reported in Table 1). Figure 7 rank goods by their global income elasticities (e_i^c) and participation rates (p_i^c) and their corresponding cross country standard deviations. Both variables depict a high degree of heteroskedasticity. The cross country standard

¹⁷We drop instances where either country has missing data on consumption of either good j or i .

¹⁸The colour of the matrix elements reflect the magnitude of reported frequency.

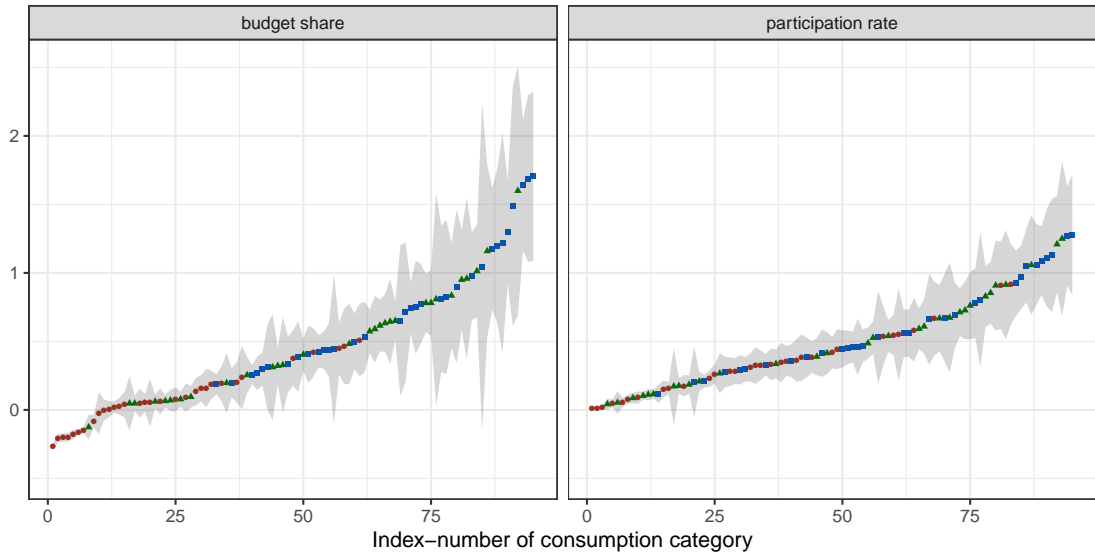
Figure 6: Similarities in Expenditure hierarchies across countries

	1 Personal transportation	2 Recreation	3 Education	4 Means of communication	5 Housing	6 Passenger transportation	7 Electricity	8 Health	9 Clothing	10 Food and beverages
1 Personal transportation		0.2	0.2	0.1	0.1	0.1	0.2	0	0	0
2 Recreation	0.8		0.3	0.3	0.1	0.2	0.2	0	0	0
3 Education	0.8	0.7		0.5	0.4	0.3	0.4	0.2	0.2	0
4 Means of communication	0.9	0.7	0.5		0.4	0.3	0.3	0.3	0.2	0
5 Housing	0.9	0.9	0.6	0.6		0.4	0.5	0.3	0.2	0
6 Passenger transportation	0.9	0.8	0.7	0.7	0.6		0.6	0.4	0.3	0
7 Electricity	0.8	0.8	0.6	0.7	0.5	0.4		0.4	0.3	0.1
8 Health	1	1	0.8	0.7	0.7	0.6	0.6		0.3	0.1
9 Clothing	1	1	0.8	0.8	0.8	0.7	0.7	0.7		0
10 Food and beverages	1	1	1	1	1	1	0.9	0.9	1	

Note: Rows/columns of the matrix represent expenditure groups in the increasing order of average cross-countries elasticity: for example, row/column 1 is *personal transportation* and row/column 10 is *food*. It implies that $\bar{e}_1 > \bar{e}_{10}$. A matrix element $\{i, j\}$ is the percentage of cases across all countries when expenditure group i and j are reported and expenditure group j has elasticity higher than (or equal to) group i , $e_j^c \geq e_i^c$. Source: GCD data.

deviation is positively correlated to e_i^c and p_i^c . Among necessities (such as potatoes), the cross country variation in e_i^c is close to zero. Among luxuries like motor cycles, the standard deviation e_i^c is much larger. The finding is also consistent with empirical findings of previous literature that household spending patterns tend to be heterogeneous across countries (Carruth et al., 1999; Selvanathan and Selvanathan, 1993; Rathnayaka et al., 2022).

Figure 7: Global Income elasticities and their standard deviation, GCD data



Note: Shaded area is cross country standard deviation of global income elasticity. Goods are ranked by the value of global income elasticity on the horizontal axis. The figure doesn't display the top four goods: Cars, Domestic services, Package holidays, Air travel.

Do expenditure hierarchies across countries exhibit path dependent properties? Results in Table 4 analyze pairwise distances in expenditure hierarchies between countries ($-d(c_i, c_j)$). The results show that the GDP difference between the two countries is positively correlated with $-d(c_i, c_j)$. This effectively confirms the Linder Hypothesis (Linder, 1961; Hallak, 2006). Here it is worth noting that the standard approach to studying the Linder Hypothesis is to proxy differences in demand structure between countries using countries' differences in GDP (Hallak, 2006). Our results provide a much richer view of demand structure that show the similarities between expenditure hierarchy of countries is not only related to differences in GDP, but other observable characteristics.

Second, the results also show a positive correlation and significant between $-d(c_i, c_j)$ and geographical distance: the further away two countries are located, the more dissimilar are their expenditure hierarchies. This is likely due to reduced migration, tourism, trade and capital flows between countries. The closer two countries are, the greater is the propensity of countries to engage in exchange of people, goods and investment that can stimulate institutional change (Acemoglu et al., 2005). Such flows also increase the supply of variety (on the supply side) and stimulate changes of consumer preferences.¹⁹ This result is consistent with previous studies that show consumption patterns tend to converge in highly integrated economic regions, such as within the European Union (Michail,

¹⁹Richard Day also considered how the spatial diffusion of new goods was influenced by geographical proximity (Day, 1970)

2020). These results support the notion that expenditure hierarchies are path dependent in the sense that cross border flows influence social institutions and the observed demand structure and expenditure hierarchy within countries. The results also show that a common language is negatively correlated with $-d(c_i, c_j)$. This is likely due to the role that common languages play in reducing the transaction costs of economic exchange between countries.

The results on common colonizers and political fragmentation provide more evidence that exhibit hysteresis. Differences in expenditure hierarchies are smaller among countries who were historically colonised by the same country. Colonisation influences social institutions (Acemoglu et al., 2001) and consumption patterns (Howes et al., 1996; Oktay and Sadıkoğlu, 2018). The results on political fragmentation show that countries which recently shared a common parent country also possess more similar expenditure hierarchies. Comparing the parameter estimate for political fragmentation to the parameter estimate for common colonizer, it is worth noting that the former has a relatively larger influence on expenditure hierarchies. In terms of understanding expenditure hierarchies as being a product of a non-ergodic stochastic process, it is intuitive that recent events (post 1945) are more influential on the demand structure of countries relative to older events as proxied by the common colonizer dummy.

Table 4: Regression results: Cross country differences in expenditure hierarchies

<i>Dependent variable: Logarithm of the distance between</i>		
<i>preference hierarchies of a pair of countries</i>		<i>log(d(c_i, c_j))</i>
<i>log GDP difference</i>	0.0718***	(0.00777)
<i>log Geographical distance</i>	0.0680***	(0.00885)
Common border	0.0345	(0.0374)
Common official language	-0.0389**	(0.0196)
Common colonizer	-0.0684***	(0.0195)
Political Fragmentation	-0.242**	(0.121)

Fixed effects of countries included. Robust standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$
The full regression, including control variables is given in the Appendix.

5.3 Niche markets

We now turn to study the emergence of niche consumption by tracking differences in the diversity of spending on the aggregate level D_a and the household level D_{hh} . Figure 8 reports the relationship between $D_a - \overline{D_{hh}}$ and the household income in Malawi, South Africa and the UK. These countries are drawn from different parts of the global income distribution.

In spite of vast differences in GDP per capita across countries, the figure shows that among the affluent household in each country there is a tendency for the $D_a - \overline{D_{hh}}$ to rise with household income. This result is consistent with Neiman and Vavra (2019) and Kiedaisch et al. (2018) and reflects a tendency for affluent consumers to concentrate their spending into different niche goods and services. This leads to D_{hh} falling at high income levels, while D_a rises. Note that cross country differences in the slope of the curve are to some extent influenced by differences in the number of expenditure categories (35 in Malawi, 752 in South Africa and 12 in the UK).²⁰ The expenditure categories in which $D_a - \overline{D_{hh}}$ grows significantly include recreational services and package holidays, which are luxuries (see Table 2).

A notable feature in the UK and South African patterns is that $D_a - \overline{D_{hh}}$ appear to decline at among low income levels. This is consistent with Chai et al. (2015) and indicates that spending patterns are more homogeneous among middle income households, compared to low income households. This phenomenon is connected to the food choices among the poorest and the expansion of the intensive margin. Among the poorest $D_a - \overline{D_{hh}}$ is large in some countries as food spending is concentrated on staple foods such as potatoes, rice or cereal. The type of staple food consumed by the poor is heterogeneous in South Africa, while the choice of staple food in Malawi (maize) is relatively more homogeneous (Andersson, 2011). $D_a - \overline{D_{hh}}$ declines as the intensive margin of food expands as consumer diversify their spending more evenly across food varieties (See results in 5.2).

To investigate how widespread the rise of niche consumption is among households within income deciles, Figure 11 in the Appendix reports the frequency distribution of spending diversity at the household level within each income decile across Malawi and South Africa. The red vertical line indicates D_a , while the black line indicates $\overline{D_{hh}}$. In the case of Malawi, the frequency distribution appears to be normal among the lowest five income deciles. Across the top 5 income deciles in Malawi, the distribution becomes positively skewed and fat tailed. The emergence of a fat tail on the left of the distribution represents growth in the number of households in each decile that possess relatively con-

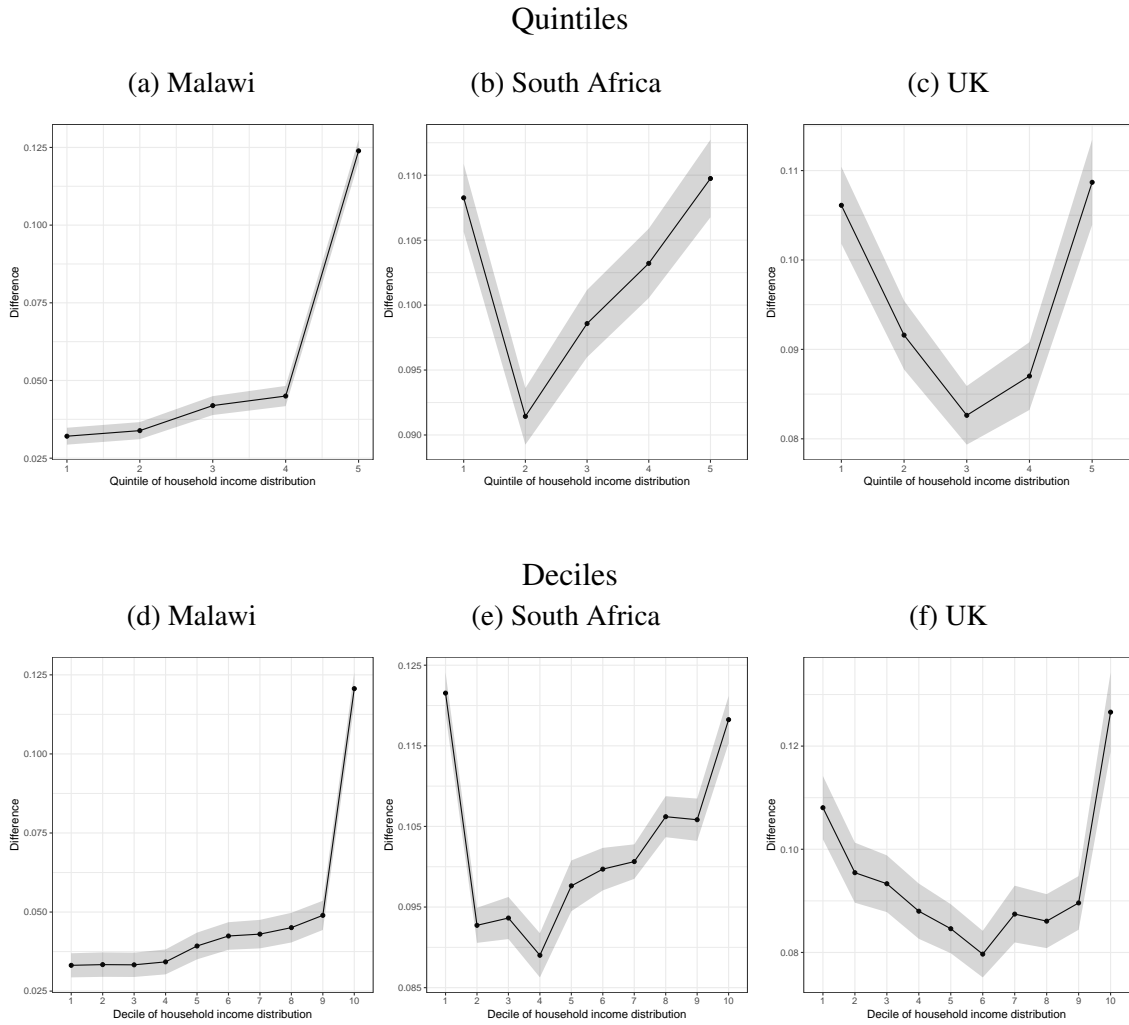
²⁰Kiedaisch et al. (2018) use the UK data show that results are robust when the number of expenditure categories used in the analysis are varied.

centrated spending patterns. This causes $D_a - \overline{D_{hh}}$ to increase (see red and black lines). At the same time, the peak of the distribution also rises on the right, which suggests that there is also growth in the number of affluent households in Malawi that possess relatively diversified spending patterns. This increase in spending diversity among some segments of rich households is likely due to the increase in the intensive margin of food (see Section 5.1).

Interestingly, the emergence of a fat tail and right skewed distribution is observable across all ten of income deciles in South Africa. Similar to Malawi's case, the distribution of spending diversity becomes more fat-tailed among high income segments. This shows that a larger proportion of households possess relatively more concentrated spending patterns, driving up $D_a - \overline{D_{hh}}$. Interestingly, the peak of the frequency distribution also declines in South Africa. This reflects a relative decline in the number of households that possess relatively diversified spending patterns.²¹ Across South Africa and Malawi, a fat tailed distribution consistently emerges among rich segment of the population. In Malawi, it emerges only in the highest income decile. The fat tail emerges at relatively lower income deciles in South Africa. This difference is likely due to differences in GDP per capita. South Africa has a GDP per capita of around US\$8,000 compared to US\$500 in Malawi.

²¹Due to space constraints we do not report the frequency distribution for UK deciles. These also show a similar right skew distribution for $D_a - \overline{D_{hh}}$ across all 10 income deciles. these are available upon request.

Figure 8: Difference between Total Aggregated level of Diversity and Average households' diversity by quintiles and deciles of income distribution



Note: The number of Expenditure categories vary across countries. Malawi has 35 consumption categories. South Africa has 752 consumption categories. UK - 12 consumption categories

6 Conclusions

Consumer demand is not a single homogeneous, unchanging mass as portrayed in many macroeconomic growth models. The overarching theme of this paper has been to use recent international data to study how the composition of spending tends to evolve in fundamental ways as economies grow. We have broadly shown how this process is not completely random and unpredictable, but in fact follows a set of well known stylized facts. To make sense of contemporary cross country differences in spending patterns, it is imperative to consider how the macroeconomic conditions and social institutions influence spending patterns.

This paper empirically tracked how consumers diversify their spending patterns and consume a wider range of good and services as economies develop. The results show that there exists a broad pattern that characterizes how the growth in spending diversity unfolds: among low levels of per capita GDP, a channel through which spending diversity grows is the intensive margin of food as consumers diversify their food diet. At higher levels of per capita GDP, the extensive margin in services plays a prominent role in the growth of spending diversification as a wider range of services is consumed in rich countries. This shift represents support for the thesis that the structural change through which the service sector grows in prominence is to some extent a reflection of shifts in final demand that are induced by the growth GDP (Pasinetti, 1983; Bertola et al., 2014; Herrendorf et al., 2014; Boppart, 2014).

Beyond GDP growth stimulating shifts in the composition of demand, our results also confirmed that income inequality can reduce the homogeneity of demand by desynchronizing the spending diversification process across the population of consumers. Our results show that income inequality is negatively and significantly correlated with average market depth: higher income inequality tends to reduce the average share of households found consuming a particular good. These results confirm the conjecture that high level of income inequality can inhibit the realisation of economies of scale (Murphy et al., 1989; Ibragimov et al., 2017; Foellmi and Zweimüller, 2017). There was also a negative and significant correlation between the level of income inequality observed in a country and the number of varieties consumed (extensive margin) among affluent countries. Among poor countries, income inequality is found to have a positive impact on the number of varieties consumed, which is consistent with earlier findings reported by Falkinger and Zweimüller (1996).

The analysis of expenditure hierarchies across countries also shows that there is a tendency for spending patterns in each country to become more unique as the focus of spending shifts away from meeting basic needs that are universally shared and homogeneous around the world. We found that all expenditure hierarchies observed around the world share a common base in the sense that the income elasticity of food is consistently ranked below the income elasticities of all other goods and services. Among higher order goods, expenditure hierarchies are more unique as cross country differences emerge in the order of income elasticities of luxury goods. This is consistent with empirical findings that expenditure patterns across countries are significantly different (Carruth et al., 1999; Rathnayaka et al., 2022). Comparing pairwise cross country differences in expenditure hierarchies, we also show that the expenditure hierarchy in a country is influenced by its social institutions and exhibits path dependent properties. These results shed more light on the Linder Hypothesis and are consistent with the observation that spending patterns

of highly integrated countries tend to converge (Michail, 2020).

Finally our results on niche consumption show that there are distinct differences in how consumers diversify their spending as their income grows. Whereas poor consumers diversify spending in a homogeneous ‘American’ manner that helps foster the emergence of mass markets, spending diversification among the rich is more ‘British’ as they concentrate spending into different nice areas that leads to a overall decline in the homogeneity of demand. So Marshall’s observation about the differences between American and British preferences actually describe the spending diversification process across the income distribution. At high levels of income, the growth in the heterogeneity of spending patterns ultimately requires scholars to move away from representative agent models and towards models that feature multiple representative consumers (Aversi et al., 1997; Kiedaisch et al., 2018).

As Richard Day recognized, a key force driving macroeconomic evolution is the emergence of internal diseconomies (Day, 2018). Production within a given economy must eventually exhibit diminishing returns because the increasing complexity of planning, communicating, and coordinating production activity as the economy grows. Results in this study highlight one source of internal diseconomies is the demand side. As the economy grows, the homogeneity of demand declines due to rising income inequality on the macro level and the rise of niche of consumption on the micro level. This stimulates the emergence of new approaches to production that better cater towards differentiated preferences via the emergence of small scale ‘niche’ goods and services.

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7 APPENDIX

Table 5: Impact of inequality on Extensive margin of diversity, ICP data

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<i>Dependent variable: Extensive margin</i>	Total	Food	Goods	Services	Total	Food	Goods	services
<i>log GDP per capita</i>	2.279*** (0.578)	0.486*** (0.151)	0.199 (0.181)	0.813*** (0.295)	5.254*** (1.606)	0.957* (0.529)	1.298** (0.529)	2.673*** (0.779)
Inequality	-0.0641 (0.0576)	0.0294 (0.0178)	-0.0183 (0.0162)	-0.0800** (0.0310)	0.651* (0.361)	0.143 (0.124)	0.246** (0.121)	0.367** (0.178)
Interaction term: Inequality \times log GDP per capita					-0.0796** (0.0377)	-0.0126 (0.0130)	-0.0294** (0.0129)	-0.0498*** (0.0186)
<i>log Population</i>	-1.018** (0.487)	-0.551*** (0.137)	-0.237 (0.145)	-0.121 (0.247)	-0.917* (0.485)	-0.535*** (0.139)	-0.199 (0.143)	-0.0578 (0.247)
<i>log Size</i>	0.935** (0.379)	0.263** (0.110)	0.282*** (0.107)	0.358** (0.177)	0.811** (0.392)	0.243** (0.114)	0.236** (0.110)	0.280 (0.185)
Urbanization rate	0.355 (3.281)	0.803 (1.029)	0.309 (1.103)	1.169 (1.804)	0.831 (3.315)	0.878 (1.044)	0.485 (1.097)	1.467 (1.813)
Constant	78.09*** (8.223)	29.67*** (2.186)	27.54*** (2.229)	25.64*** (4.246)	50.69*** (17.13)	25.33*** (5.325)	17.42*** (5.350)	8.516 (8.503)
Observations	163	163	163	163	163	163	163	163
R^2	0.254	0.255	0.072	0.201	0.271	0.259	0.100	0.225

Robust standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

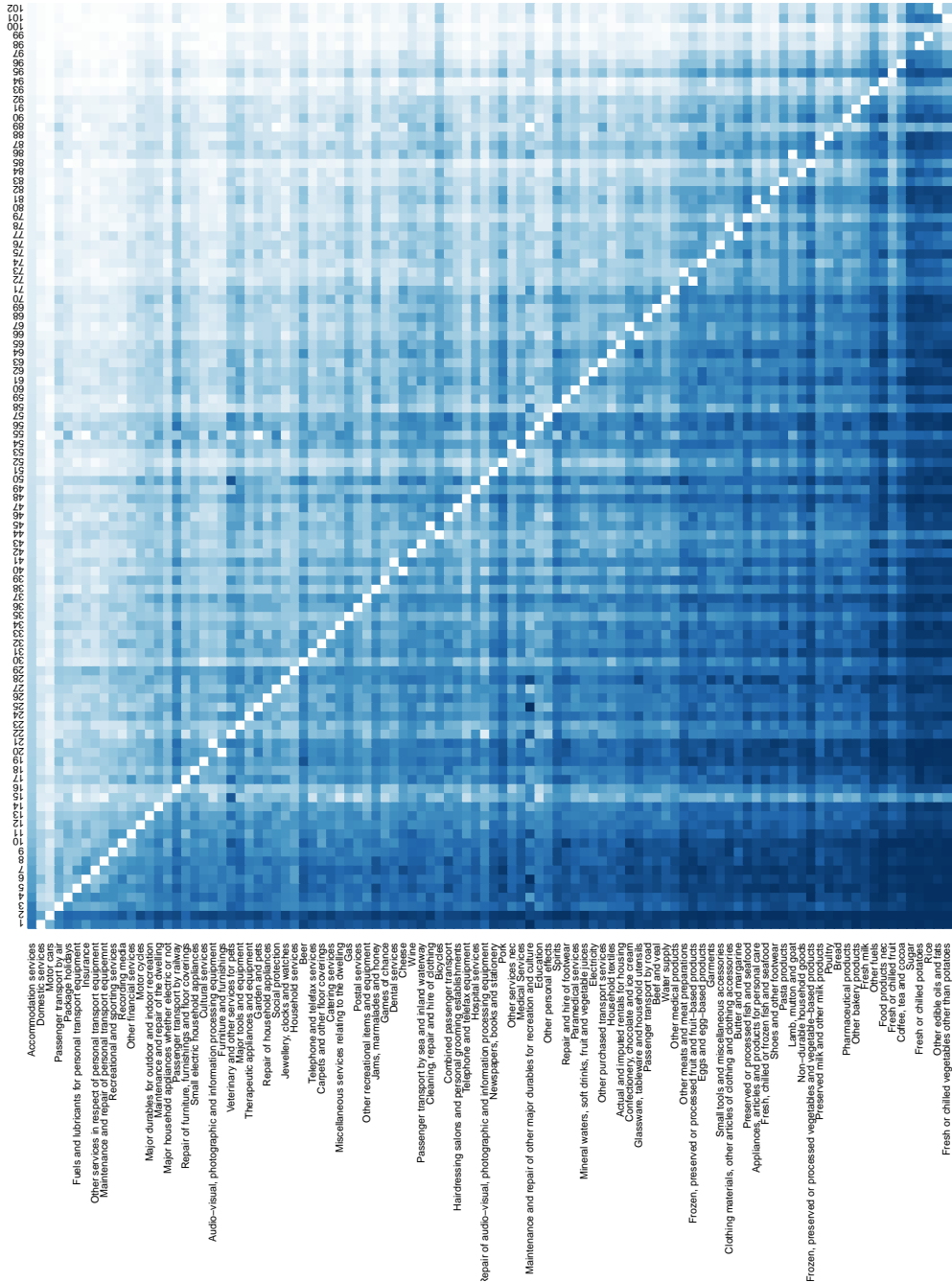
Table 6: Impact of inequality on Market Depth, GCD data

<i>Dependent variable: participation rate_i</i>	(1)	(2)
<i>log GDP per capita</i>	6.121*** (0.448)	6.121*** (0.448)
Inequality	-0.562*** (0.0468)	-0.664*** (0.0590)
Cross countries value of product's elasticity	-10.02*** (0.415)	-16.02*** (2.270)
Interaction term: Inequality \times Cross countries value of product's elasticity		0.154*** (0.0554)
<i>log Population</i>	1.374*** (0.375)	1.374*** (0.375)
<i>log Size</i>	0.160 (0.319)	0.160 (0.318)
Urbanization rate	-1.973 (2.500)	-1.973 (2.498)
Constant	-7.584 (5.104)	-3.613 (5.301)
R^2	0.133	0.135
Observations	9434	9434

Robust standard errors in parentheses

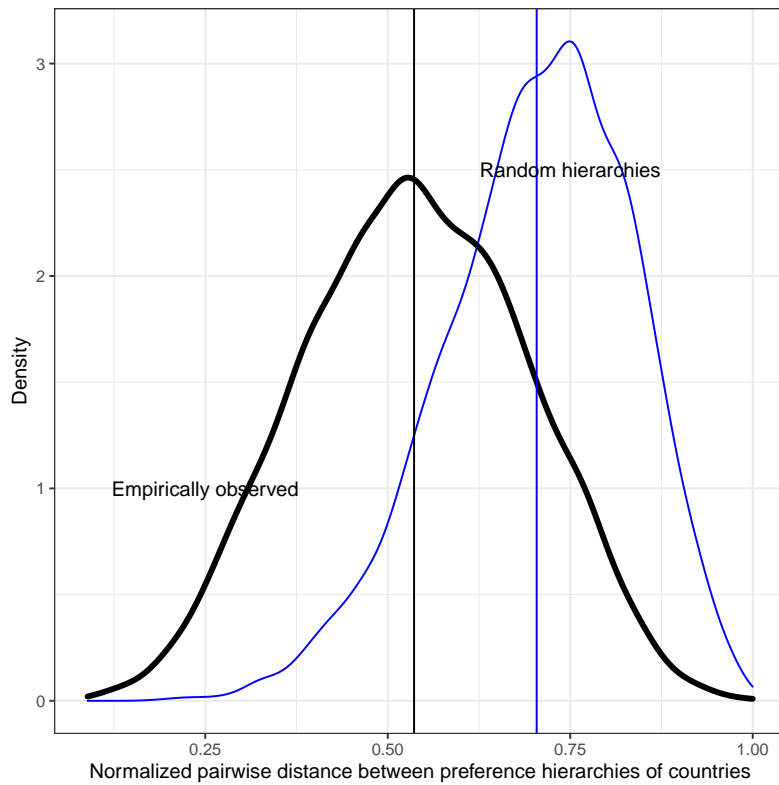
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Figure 9: Stability of preference hierarchies across countries



Note: Rows and columns of the matrix represent expenditure categories in the increasing order of average cross-countries elasticity. A matrix element $\{i, j\}$ is the percentage of cases across all countries when expenditure category i and j are reported and expenditure category j has elasticity higher (or equal) than category i , $e_j^i \geq e_i^j$. Cells are shaded according to these values, where a dark shading reflects large values.

Figure 10: Distribution of normalized countries' pairwise distance between hierarchies, empirical vs randomly generated



Note: The distance is normalized to the (0,1) interval by dividing over the maximum. The black line shows the distribution of the pairwise distance between national expenditure hierarchies. The blue line shows the distribution of the distance between randomly generated hierarchies. The vertical lines show the average value of each distribution. Country pairs that are geographically close to each other (e.g. India and Nepal, Malawi and Uganda) have similar expenditure hierarchies and are located on the left of the distribution. Countries with very different expenditure hierarchies on the right of the distribution include Rwanda and Latvia, Togo and Romania

Table 7: Determinants of differences between preference hierarchies across countries

<i>Dependent variable: Logarithm of the distance between preference hierarchies of a pair of countries</i>		
	<i>log(d(c_i, c_j))</i>	
<i>log</i> GDP difference	0.0718***	(0.00777)
<i>log</i> inequality difference	0.0137***	(0.00485)
Interaction term: <i>log</i> GDP difference x <i>log</i> inequality difference	-0.00164***	(0.000615)
Urbanization rate difference	0.0993**	(0.0447)
<i>log</i> Population difference	0.0118**	(0.00506)
<i>log</i> Size difference	-0.00242	(0.00436)
<i>log</i> Geographical distance	0.0680***	(0.00885)
Common border	0.0345	(0.0374)
Common official language	-0.0389**	(0.0196)
Common colonizer	-0.0684***	(0.0195)
Political Fragmentation	-0.242**	(0.121)
Constant	0.501***	(0.128)
<i>R</i> ²	0.45	
<i>Observations</i>	2830	

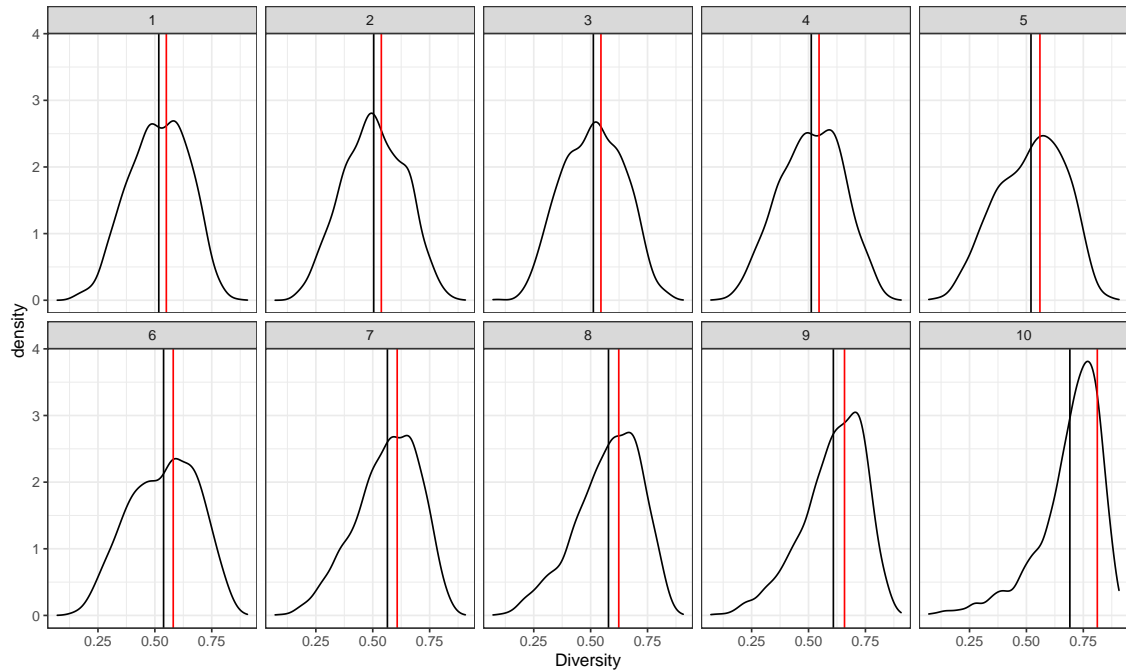
Fixed effects of countries included.

Robust standard errors in parentheses

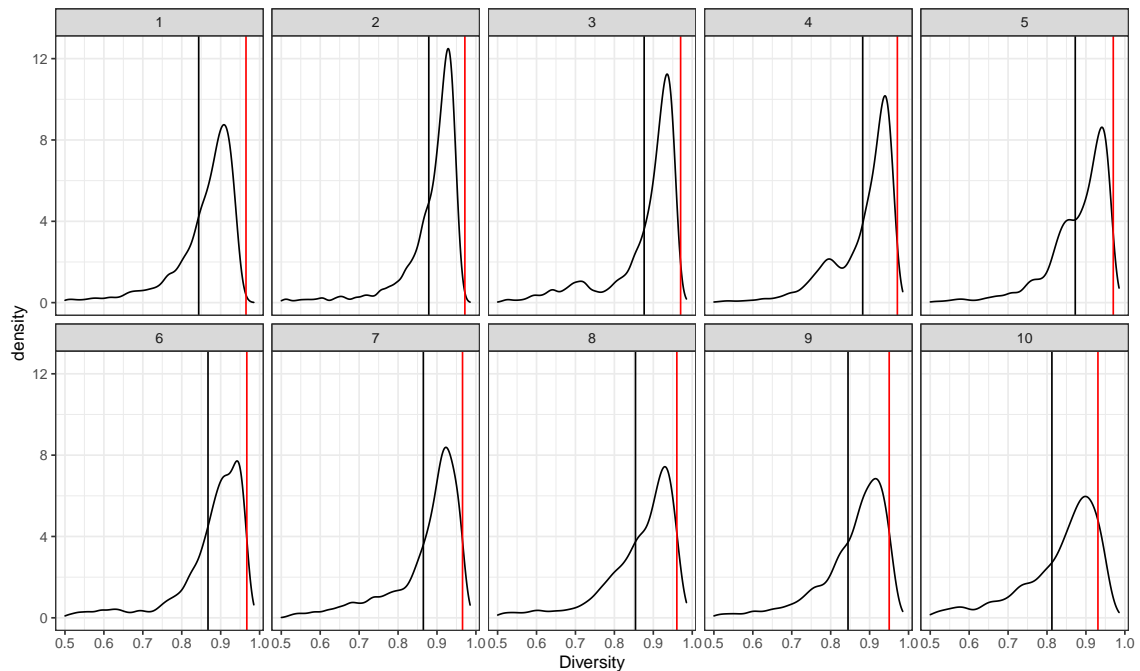
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Figure 11: Aggregate and household level Spending Diversity in Malawi and South Africa

Malawi (35 consumption categories)



South Africa (752 consumption categories)



Black vertical line indicates Average households' diversity within a given Decile
 Red vertical line indicates Total Aggregated level of Diversity for a given Decile