

Demand, economic development and innovation: A review of the long run linkages.

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1. Introduction

Household spending is the essential driving force of economic growth - it represents more than half of GDP in most developed economies. As their wealth grows, households tend to rapidly alter their spending patterns and a wide variety of new goods enters the consumption basket. This phenomenon is widely viewed as a welfare-enhancing feature of modern economic development (Romer 1990, Grossman and Helpman 1991, Barro and Sala-i-Martin 1995). Recent years have witnessed the growing popularity of domestically-orientated growth strategies (e.g. Deer and Song 2012). This has motivated policymakers to take a renewed look at the evolving character of final demand and its influence on the industrial composition of growing economies. It is therefore timely to review precisely what is known about how the composition of household spending evolves as it expands and its growth implications.

This paper discusses the longstanding conjecture that changes in the industrial composition of growing economies are linked to changes in the composition of household demand (e.g. Kuznets 1973, Foellmi and Zweimüller 2008). Over the past 150 years, research into household spending patterns has revealed that large, non-marginal increases in household income tend to accompany economic development, which has a pervasive influence on the composition and magnitude of household spending across almost all domains of spending. The most well-known example of this is Engel's Law, which states that the share of household spending on food tends to decline as households grow richer. Beyond that, households consume a wider variety of goods (Jackson 1986), more expensive types of goods and services (Bils and Klenow 2001A) and the overall dispersion of household spending across different consumption domains tends to grow (Clements and Gao 2012). Moreover, differences in the spending patterns of affluent households rise (Chai et al. 2015). While low- and middle-class households tend to spend in a relatively similar manner, spending patterns among affluent households are vastly different, likely due to the greater discretionary power these households enjoy in spending. All in all, income effects are typically found to have a much stronger impact on consumption patterns than price effects (Brown and Deaton 1972, Lavoie 1994, Clements et al. 2006).

The evolving character of consumption patterns has important implications for industry growth and the wider economy. The most direct impact is the extent to which industries can

realize increasing returns to scale. Moreover, income induced shifts in household spending create opportunities and challenges for both mature sectors experiencing declines in demand growth and new sectors of the economy producing luxury goods. For mature sectors, slowdowns in demand may reduce their capacity to achieve scale economies and further trigger innovative activity as entrepreneurs and firms seek out to delay slowdowns in growth via product innovation. For new sectors, demand growth can lead to increasing returns and enable industries to dedicate more resources to Research & Development (R&D) activities (Foellmi and Zweimüller 2006). New sectors simultaneously have to contend with the issue that the heterogeneity in demand grows at high income levels in a way that limits the realization of scale economies. In the wider economy, the current literature suggests that income-induced shifts in household consumption also impact trade patterns, labor supply and wage inequality between unskilled and skilled workers.

There are three broad goals of this study: The first is to outline how the composition of final demand tends to evolve as household income grows and . The second is to discuss what implications these trends in demand have for the industrial composition of growing economies. Finally, the study will discuss how consumption patterns are linked to a range of demographic, geographic, and social factors that may account for observed differences in the cross country consumption patterns.

The main arguments of the paper are:

- The composition of household spending tends to undergo fundamental changes as rising income fuels the expansion of household expenditure.
- As households become more affluent they tend to consume a wider variety of household goods and the budget share of food spending tends to decline.
- Differences in spending patterns between households tend to grow as household income rises, creating new opportunities for niche markets and higher quality goods
- Households cease to increase their spending on some goods and services that appear to have reached saturation levels of expenditure.
- These saturation levels are subject to change in light of new innovations and changes in the income distribution and relative prices.

- Uneven technological change across sectors can also impact the composition of spending by reducing the overall share of household spending dedicated to manufacturing
- On the sectoral level, evolving patterns of final demand can impact the realization of economies of scale and the level of innovative activity.
- In the wider economy, the evolving pattern of demand also affects trade flows, labor supply and the accumulation of human capital.
- Economic development influences the character of demand via rising income inequality, urbanization, rises in the opportunity cost of time, falls in fertility rates and family size.

These points highlight that existence of important dynamic linkages between the manner in which demand grows and the relative size of different sectors in the economy. These links have the potential to form part of an autocatalytic process through which the demand and supply side of the economy influence each other and coevolve. But this process is neither inevitable nor smooth. Slowdowns in aggregated demand, in combination with productivity improvements, imply that economic resources need to be reallocated as mature sectors face stagnation and new sectors emerge. In addition, the strength of the links between consumption and production strongly depends on how widely income growth is distributed across households, the competitiveness of industries, the extent to the economy is orientated towards producing for domestic markets and functioning and flexible markets for factor resources. From an international level, since evolving demand may influence the international competitiveness of export sectors, a further issues arises around synchronized shifts in demand within the economy are to similar shifts occurring in other economies (Matsuyama 2009, Hallak 2010).

This paper is structured as follows. Section 2 briefly summarizes the concept of demand-driven structural change. It also discusses the main properties of Engel Curves (ECs) and the notion of demand saturation. Section 3 discusses how two well-known macroeconomic trends mentioned in the structural change literature tend to impact consumption patterns: Engel's Law and Baumol's disease. Section 4 outlines the broader

connections between household consumption patterns and economic development. Section 5 concludes the paper.

2. Demand-driven Structural Economic Change

Structural economic change describes the long run process through which certain sectors experience faster growth than others, which leads to the reallocation of employment and capital across sectors (Chenery 1968, Krueger 2008). The typical structural change experienced by growing economies can be summarized as follows. The agricultural sector tends to dominate during the early stages of development. During industrialization the spread of the factory systems of production tends to propel the manufacturing sector into a dominant position. In At later stages of development the services sector eventually emerges as the largest sector of the economy (Herrendorf et al. 2014). There are a number of different reasons why this may occur. Differences in the rates of technological change, factor endowments, export opportunities and sectoral price trends may all play a role (Chenery 1968, Kuznets 1973, Buera and Kaboski 2012B).

To account for these structural changes, it is natural to look for causes that are ‘endogenous’ in the sense that they are intrinsically connected and a product of the economic development process. Such explanations are preferred because they may explain why many different economies experience relatively similar structural changes as their economies develop. Explanations relying on exogenous factors struggle to explain why structural changes are similar across a wide range of economies and historical era.

Here many scholars have conjectured that the evolving nature of demand could play an important role in causing structural change. Some examples include, among others, studies by Pasinetti (1981), Aoki and Yoshikawa (2002), Metcalfe et al. (2006), Bertola et al. (2006), Pyka and Saviotti (2008) and Ciarli et al. (2010). According to this view, the agricultural sector tends to dominate low income economies because most of household spending is dedicated to consuming food. As households become wealthier and begin to diversify their spending, resulting in the growth rates of manufacturing and services industries begin to rise.

In this way, the industrial composition of an economy is intrinsically linked to the composition of household spending. Given that demand shifts are income-induced, a positive

feedback loop emerges between evolving patterns of demand and structural changes that drive up household income. Such thinking is not new. Ever since the industrial composition of Western economies underwent a radical transformation during the industrial revolution, scholars have studied how this phenomenon may be linked to the systematic changes in the character of household spending (Engel 1857, Fourastie 1949, Clark 1950, Kuznets 1973).

2.1 Engel curves

Engel curves (ECs) describe the relationship between household consumption of a good or service and household wealth. The latter is usually measured using the consumer's total expenditure or income. The former can take the form of either i) expenditure, ii) quantity consumed or iii) budget share. Expenditure and budget share ECs are the most commonly used. Note that budget share ECs are typically downward sloping, while expenditure ECs are upward sloping. The upward slope indicates that spending on a good tends to rise with income, even if spending declines as a proportion of all household spending, as reflected in the downward slope of the budget share EC.

Data for estimating ECs are typically sourced from national household expenditure surveys. By sampling a large number of households across a range of income levels, it becomes possible to study how the consumption patterns of goods change with income, holding other factors such as relative prices and household characteristics fixed. As such, the underlying income distribution of households is a major determinant of the length and shape of the EC (discussed further in section 4). The goods chosen are usually aggregated across a range of similar commodities such as for example, total food, clothing and transport. In other cases they can refer to the underlying characteristics of commodities, such as calories (Deaton and Subramanian 1996) or variety (Jackson 1986)

ECs provide the basis for calculating the income elasticities of goods. This measures the responsiveness of spending on a good to a change in the household income at a given income level. Income elasticities are used to predict how rising household income stimulates changes in the composition of final demand. They answer the hypothetical question 'if household income would grow by 1 per cent, how much would spending on a good change?' Goods and services that possess income elasticities greater than unity are considered to be luxuries. This implies that as household income grows, the growth rate of spending on these goods is greater than income growth. Goods with an income elasticity between 0 and 1 are

normal goods, which implies that consumption will remain constant (in the case of 0) or grow at the same rate as income (in the case of 1). Goods with a negative income elasticity are known as “inferior goods”: consumption will fall as income rises.¹

How accurate are income elasticities in predicting the growth rate of different goods and services? Figure 1 plots the relationship between estimated income elasticities and the relative growth rate of goods over a 20 year period in the USA (Aguair and Bils, 2015). The horizontal axis reports the income elasticity of the good – the higher the value, the steeper the slope of the estimated EC. Goods and services appearing to the right of unity are considered luxuries. These include entertainment (ent) and education (educ). Goods and services to the left of unity and to the right of zero are considered normal goods, such as food eaten at home (foodhome) and utilities. Tobacco is the only good that appears to be an inferior good. The vertical axis reports the relative growth rate across a period of approximately two decades (1980/82 to 2008/10). Long run growth rates in demand will be discussed further in Section 3.1.²

*****Figure 1 About Here*****

ECs possess several important properties:

A. Income elasticities vary significantly across categories

Differences in the slope of ECs across goods are quite significant. As seen in Figure 1, this implies that that the growth rate of demand for some goods and services will be higher relative to other goods and services. To get an idea of cross country differences in income elasticities, Table 1 reports the income elasticities of 8 highly aggregated expenditure categories found in Clements et al. (2006). Food spending consistently possesses the lowest income elasticity of all categories. In almost all cases the food income elasticity is not greater than unity in most cases, which supports Engel’s law. Similar results are found in Aguir and Bils (2015). These results support the notion that spending tends to shift from food spending to non-food categories as income grows. However, while several types of services tend to report high income elasticity, there is no clear evidence that services possess relatively higher incomes elasticities compared to goods (Section 5 will discuss this issue further).

*****Table 1 About Here*****

¹The interpretation of income elasticities for budget share ECs differs in these critical values.

²This analysis is limited to one highly developed country. Open questions remain about the extent to which this accuracy holds in developing countries. Young (2012) reports growth trends and income elasticities in the consumption patterns of 29 sub-Saharan and 27 other developing countries.

B. Heteroscedasticity.

A second important feature of EC estimates that the differences in spending patterns between consumers of the same income level tend to grow with income. Among the low income segments, household spending tends to have patterns that are very similar to spending patterns dominated by food. As income grows, differences grow considerably as a greater share of spending is discretionary in nature and basic needs cease to dominate priorities. In Figure 2, these growing differences are reflected in the variation around the mean (heteroscedasticity). The growth of errors may be due to a number of reasons, including measurement error: affluent households are less likely to participate in household surveys than rich households.³ However, it is worth noting that the variation seems to be growing over time, as economies develop and household income rises. This has triggered some to argue this variation is behavioral in nature (Chai et al. 2015). At high income levels, some households may still choose to dedicate all their income to food, while others dedicate hardly any of the income to food. This variation is far smaller for low income households.

Figure 2 About Here

This phenomenon is likely related to the specialization of consumption patterns at high income levels where households enjoy greater discretionary power over spending. At low income levels, discretionary power is relatively limited as households dedicate most of their income to satisfying a universal set of basic needs that relate to spending on food, shelter and clothing. At higher income levels, the expansion of spending is much more heterogeneous in nature and dependent on the tastes, social influences and learning patterns of consumers (Witt 2001, Gualerzi 2001, 2012, Fremstad 2016). Thus reaching saturation level of household spending in necessities leaves affluent households able to pursue other consumption priorities that are more unique in nature. In this sense, the variation in consumer spending could be optimistically interpreted as a sign that consumers possess greater discretionary power in making spending decisions. Given that rich households tend to buy higher quality good (Bils and Klenow 2001A, Clements et al. 2012), this variation suggests that affluent households specialize in certain goods and services and concentrate their spending these limited number of expenditure categories. As a result, markets for the consumers are likely to be small-scale niches where a small number of consumers have a

³ In addition, models may be omitting important explanatory variables.

relatively higher willingness to pay for goods (Foellmi and Zweimüller 2008, Malerba et al. 2007, Guerzoni 2010).

As affluent households specialize into different expenditure categories, this implies that rising income tends to expand the variety of goods and services that is consumed by the overall population of households (Chai et al. 2015). Evidence for a positive relationship between household income and the aggregate diversity of spending has been found in a number of studies of cross-country demand analysis (Theil and Finke, 1983, Falkinger and Zweimüller 1996, Clements et al. 1996, 2006, 2012). For example, in a study featuring 91 consumption items across 57 countries, Falkinger and Zweimüller (1996) found a strong positive relationship between a country's per capita income and the number of items that it consumed. The poorest country in the sample (Tanzania) consumed 19 out of a possible 91 items, which is much lower than the 90 products consumed by the richest country in the sample (United States).

C. Stability

A third characteristic of ECs is that their position and shape may be subject to change over time for a number of reasons (Moneta and Chai 2012). A key issue in this regard is the extent to which expenditure categories are aggregated. Highly aggregated ECs are likely to exhibit more stability relative to ECs for individual goods and services (Aguair and Bils 2015). However, analyzing ECs on a highly aggregated level can be misleading as the shape of EC can be fundamentally dependent on the level of aggregation (Blundell and Stoker 2005). Therefore, great care should be taken about making inferences about individual consumer behavior using highly aggregated ECs (Hildenbrand 1994). For these reasons, disaggregated ECs should be favored when attempting to study the nature of non-homothetic preferences.

On the disaggregated level, a number of factors can change the shape and position of the EC:

- **Market participation rates.** For some durable goods, such as fridges and televisions, household income and price of the good may be such that consumers can not afford to purchase the good. If a large share of the population lies below the threshold level of income required to purchase a good (as reflected in the participation rates) then the lower end of the EC may be subject to significant changes over time as a larger share of households reach the threshold level of income and enter the market (Matsuyama 2002). When a large number of new households do enter the market, the shape of the

EC among the low income levels will shift. Households who are not consuming a good are usually ignored in the estimation of ECs as zero expenditures are removed from the sample (Fry et al. 2000).

- **Relative prices.** Some goods that are necessities do not have many substitutes. If the price of these goods rises and demand is relatively price inelastic, this could shift the EC upwards due to the inelastic nature of demand. Likewise falls in price leads to a downward shift in the EC. Fuel and electricity is a typical example where price rises have led to upward shifts in the EC (Moneta and Chai 2014). If there are differences in the price elasticities of rich and poor households, the magnitude of the shifts will vary across observed in income level, resulting in changes in both the position and shape of the EC.
- **Changes in the income distribution.** As Haavelmo (1947) noted, the ordinary family-expenditure functions or EC cannot be assumed to remain invariant under transformations of the income distribution. These changes can impact both the number of consumers in a particular market, as well the observed differences in spending levels between the poor and rich on a particular good. Typically, there is a positive correlation between income and the average price paid for a good. Rich households tend to buy more expensive versions of the same good, compared to low income households (Bils and Klenow 2001A). Income inequality growth tends to follow a skewed distribution which is consistent with a small proportion of households attaining much higher incomes than the average (Chotikapanich et al. 2012). Depending on the underlying shape of the EC for a good, this could lead to either an increase or decline in the income elasticity. [**Authors note: I can expand on this point more once the empirical analysis of ECs has been completed.**]

2.3 Demand Saturation⁴

Many argue that household spending on a good with a fixed set of characteristics has an absolute upper limit beyond which expenditure ceases to rise in response to increasing income (see inter alia Aoki and Yoshikawa 2002, Metcalfe et al. 2006, Saviotti, 2001).⁵ As

⁴ This section addresses the questions “What is the concept of saturation point? Does it exist for all goods and services? How can we explain the differences in saturation points across goods and services?”

⁵ The economic historian Kindelberger (1989) also vigorously asserted that Engel's law applied to all goods

Pasinetti put it ‘there is no commodity for which any individual's consumption can be increased indefinitely. An upper satiation level exists for all types of goods and services although at different levels of real income’ (1981, p. 77, see Figure 3 below).⁶ It is worth noting that demand driven structural change does not depend in the existence of saturation level. This phenomenon will still take place as long as income elasticities across goods are significantly different. Demand saturation is also quite a different concept from ‘market saturation’ used in marketing and diffusion of innovation literature (e.g. Rogers 2010). Market saturation describes the situation in which all potential customers of a new product have adopted it. Demand saturation refers to the individual level and describes a level of spending on a good beyond which household spending ceases to rise. This suggests that a household has consumed ‘enough’ and the underlying need that motivated it to consume has been satiated at this level of spending.

Why does demand saturation occur? Slowdowns in demand reflect changes in individual preferences that take place precisely because suppliers have fully satisfied the underlying needs that originally motivated increasing consumption growth (Witt 2001, Chai 2015). Note that the notion primarily related to satiation taking place in the quantity consumed, rather than the expenditure level. The presence of demand saturation effectively represents a bottleneck on sectoral growth as demand growth could eventually cease once the population has reached the saturation level for the good (see Figure 3 below). As a result, markets may potentially stagnate as further gains in household income tend to be redirected towards the consumption of other goods. A saturation level implies that no matter how much household income increases, household expenditure on a good with a fixed set of characteristics and price stays constant at a certain level.

Figure 3 about here

Empirical evidence suggests that demand saturation occurs in some goods and services, but not in others. It is worth noting that much of this evidence strongly depends on the functional form chosen in the empirical analysis.⁷ In the following, the focus is non-

⁶ Brown and Deaton (1972) define ‘absolute saturation’ as the hypothesis that there exists a finite level of demand which is not exceeded, either as income increases or as prices decrease indefinitely.

⁷ Certain mathematical procedures can successfully suppress evidence for saturation. For example, the log-linear estimates favored by some studies (e.g. Comin et al. 2015) suggest that income elasticity of goods is constant across all income levels. However, non-linear ECs which allow for the slope of the EC to vary across income levels tend to produce much more accurate results (e.g. Banks et al. 1997, Moneta and Chai 2014).

parametrically estimated quantity and expenditure ECs, which make no prior assumptions about the shape of the EC. The most prominent example of saturation in ECs is the case of food consumption. As households become more affluent, it has been widely observed that their budget share spending on food tends to decline as household income grows (Clements and Chen 1996). Moneta and Manig (2014) provided more evidence for saturation in the quantity of calories consumed. In their cross-sectional empirical investigation of contemporary Russian food spending patterns, the authors examined the relationship between calorie consumption and income (see also Subramanian and Deaton 1996). Examining an even broader range of expenditure categories using UK data using real expenditure ECs, Moneta and Chai (2014) found that such flat and stable ECs (consistent with the saturation hypothesis) tend to be more pronounced in goods, but much less prevalent in services.⁸

However, saturation is far from universally present across all expenditure categories. There are a number of reasons why demand saturation may differ or be absent across countries, time spans and different goods categories.

- **Distribution of income.** Empirically observing saturation in ECs strongly depends on the underlying income distribution. Specifically, it is critical for a segment of the population to have reached saturation level. If the entire population is consuming a good at a level below the saturation level, this would result in linear ECs. No change in the slope at high income levels of the EC would be observed. This could account for linear being the best functional fit for the ECs of certain good and services (Lewbel 2007). Likewise, it is also important that a segment of the population is located below the saturation level of expenditure. If the entire population of households has reached the saturation level, this would result in an essentially flat EC.

It is interesting to note that rising income results in shifts in food EC that correspond to these expectations – see Figure 4 below. The ECs for sugar and milk in the UK in 1974 were much steeper relative to their counterparts in 2001. As a greater proportion of the population reaches the saturation level, this lowers the income elasticity of a good over time such that former luxuries tend towards becoming necessities. Consequently, the empirical measurement of demand saturation should be calibrated

⁸ This finding that demand saturation is more prevalent in goods rather than services is consistent with existing stylized facts that state that rising household income is positively correlated with a reduction in the share of consumer spending on goods and an increase in the share of consumer spending dedicated to services (Herrendorf et al., 2013, Boppart 2014).

to the observed income distribution in economies. [**Authors note: I can expand on this point more once the empirical analysis of ECs has been completed.**]

Figure 4 about here

- **Innovations and supply side conditions:** Another important factor determining saturation level of spending is the emergence of new, higher quality varieties of goods and services. For several consumption domains where there are high rates of technological change, there is little evidence of demand saturation. A good example is the change in the EC for telephones and telegrams between 1974 and 2001. This period witnessed the invention of the mobile phone, which created new demand for this category across all income classes (see Figure 5 below). If product innovations take place unevenly across expenditure categories, then this could explain why spending on some categories has grown faster than in other categories. In particular, Bils and Klenow (2001b) found that consumer spending tended to shift towards those spending categories that featured faster quality growth. In contrast, process innovations that lower the cost of goods and services may shift spending *away* from spending categories and lower the saturation level of spending (See Section 3.2).

Figure 5 about here

- **Social effects.** In terms of differences across spending categories, certain goods may be related to needs that are difficult to saturate, such as social status (Hirsch 1978, Frank 1985). The satisfaction derived from consumption of such goods and services depends on how much others have spent on the same good. As a result, as average spending levels increase, further spending increases in household spending could be triggered (Hopkins and Kornienko 2004). Heffetz (2011) found that there was correlation between the income elasticity of goods and the extent to which they are visible to others. Typical status goods include jewelry, clothes and automobiles (Charles et al. 2010, Heffetz 2011, Kaus 2012).

Demand saturation may also influence how sensitive consumers are to price changes. For example, using a metaregression to study household level data from around the world, Green

et al. (2013) found that demand for food was more responsive to price changes among poor households (see also Theil et al 1989). This relates to the broader idea embodied in Pigou's Law which states that there is a proportional relationship between the income and uncompensated own-price elasticities of demand for a single good (Pigou 1910, Clements et al. 1984, Finke et al. 1984, Selvanathan and Selvanathan 1993, Snow and Warren 2015). Consumers are more responsive to price changes with respect to luxuries goods than they are for necessities.

In the case of demand saturation, this logic implies that falling income elasticities also causes declines in the price sensitivity of households. Several scholars have explicitly linked demand saturation as causing falls in the own price elasticity of goods (Pasinetti 1983, Lavoie 1994, Applebaum and Schettkat 1999). If true, this suggests that rising income not only triggers shifts in the composition in spending but could also fundamentally change the nature of market competition in these markets as producers have a greater incentive to compete by improving the quality (rather than the price) of goods (Waldman 2000).

3. Engel Law and Baumol's cost disease

This section examines two well-known trends driving change in global household consumption patterns: Engel's Law and Baumol's cost disease.

3.1 Engel's Law

A considerable amount of evidence suggests that among very low income households, consumption patterns are quite homogenous and concentrated on food spending. According to a recent survey of the world's poorest, spending on food represents about 50 to 70 per cent of their budgets (Banerjee and Duflo 2007). Moreover, the dominance of food expenditure among the poor is found to also hold in cross-country comparisons of per capita consumption collected from over 30 countries between 1960 and 1982 by Clements and Chen (1996). The authors found that the average food expenditure for the 12 Least Developed Countries (LDCs) was about 40.44 per cent of total per capita consumption. In contrast, the same budget share among 18 OECD countries was 29.59 per cent – a difference of about 10 per cent. In terms of the theoretical significance of this homogeneity, it seems to reflect that basic needs related to nourishment dominate household spending priorities at low levels of income.

There is little doubt that biological evolution has endowed individuals with a set of universal basic needs, of which the most elementary is the need for nutritious materials necessary for survival, such as food and water (Witt 2001, Chai and Moneta 2012).

Engel's Law states that the budget share dedicated to food declines as household income rises (Engel 1857, Houthakker 1957). In terms of the magnitude of this effect, Banerjee and Duflo (2007) stated that a 1 per cent increase on overall expenditure translated into about two-thirds of a percent increase in the average population budget share spending on food by a poor family. Elsewhere Thomas and Strauss (1997) found an elasticity of demand for food with respect to expenditure per capita for about a quarter of the poorest urban households in Brazil. On a more aggregate perspective, evidence for Engel's law can also be found when comparing the spending patterns of poor and rich countries (Houthakker 1957). Figure 6 below highlights cross-country evidence for the EC, depicting the food budget share of national spending on the vertical axis, and per capita GDP on the horizontal axis.

Examining long run changes in the US and UK household budget share of food spending (see Table 2 and 3 below), Engel's Law predicted that the budget share on food spending would decline in the presence of rapid economic growth. In the US food expenditure represents the largest share of household spending in 1901 (42.5 per cent), this is no longer the case in 2003, where it represents only 13.1 per cent of average household spending. This represents a 29.4 per cent decline in the budget share of spending dedicated to food. At the same time, in spite of this decline, the absolute total of average annual household spending on food rose by almost \$USD5,000 per household. Lebergott (1994) attributed this increase the emergence of food products that are more nutritious, more convenient and tastier. Non-food spending rose from 57.5 per cent to 86.9 per cent in the same time period – an approximate 80-fold increase that occurred in just over 100 years.

These trends can be compared with Table 3 which reports changes in household budget shares between 1975 and 1999 in the UK (Blow et al. 2004). Average real weekly total expenditure by households – excluding spending on housing and adjusted to account for household composition – increased by slightly more than 50 per cent between 1975 and 1999, from £96.39 to £145.28.

Table 2 and 3 about here

This data suggest that the overall increase in consumer spending has been distributed across different expenditure categories in an uneven fashion. In particular, there seems to be:

- Declining budget share of expenditure on goods, such as clothing and, to a lesser extent, household durables.
- Declining budget share of expenditure on alcohol and tobacco. This can be attributed to rising prices caused by an increase in taxes on these goods. For example, the relative price of alcohol rose by some 40 per cent between 1975 and 1999 in the UK (Blow et al., 2004).
- Stable to moderately rising budget share on expenditure on services such as health care and education and entertainment.
- Increasing expenditure on transport, including motor vehicles.

These patterns suggest that rising income induces important shifts in composition of household demand away from food and toward manufactured durables and services. They do not reveal any evidence for the notion that growth rates of services is higher than the growth rate of manufactured goods. These trends are, however, consistent with the argument that more wealthy households demand a greater variety of goods as they derive utility from jointly consuming these goods with a number of other similar variants (Anderson et al. 1992, Drescher et al. 2008). Important shifts also occur within categories. For example in food spending, there is a natural decline in the budget share dedicated to grains and cereals, while the budget share of meats and other proteins tends to increase (Wu 1999). Further substitution effects are discussed in Section 4.

3.2 Baumol's cost disease

In contrast to Engel's law that predicts shifts between food spending and non-food spending due to changing consumer preferences induced by rising income, this process describes a shift in consumption between manufactured goods and services due to changing relative prices. 'Baumol's disease' is driven by an uneven spread of observed technological change across the manufacturing and the service sectors. In the manufacturing sectors, technological change tends to result in a range of process innovations through which the costs of production tend to rapidly decline (Baumol 1967, Iscan 2010). This is not the case in the service sector which tends to experience a relatively slow nature of technical change in services, known as 'Baumol's disease'. It is thought that this is due to the capital intensive nature of goods and the labor intensive nature of services. As a consequence, the prices of manufactured goods

tend to fall rapidly relative to those of services. If there is a low degree of substitutability between goods and services, this could explain why households tend to spend more on services and less on manufactured goods.⁹ Evidence for the impact of Baumol's disease is presented in Figures 7 and 8 below.

Figure 7 displays the long run trends in US household spending on manufactured goods as presented in Boppart (2014). This shows that the share of manufactured goods in total expenditure declines over time. Main categories include "motor vehicles and parts", "furnishings and durable household equipment", "recreational goods and vehicles", "food and beverages purchased for off-premises consumption", "clothing and footwear", "gasoline and other energy goods" and "other durable/nondurable goods." The dashed line represents the predicted values obtained by regressing the logarithm of expenditure share on time and a constant. Note that even if the budget share of manufacturing is declining, this does not exclude the possibility that the absolute total expenditure on manufactured goods may grow over time. It is thought that this decline in the budget share of expenditure is related to falling relative prices of manufactured goods. Figure 8 highlights long run trends in the relative prices of goods and services in the UK, as presented in Blow et al. (2004). Relative prices between goods and services in the UK between 1975 to 1999 are presented. It shows that the price of services has steadily risen in this period, while the price of durable goods has declined. The price of non-durable goods (mainly food) has stayed relatively constant.

The law of demand predicts that the rising price of services would lead to a decline in the quantity consumed. However, this appears not to be the case (Boppart 2014). There are two possible explanations for why demand may be unresponsive to falling prices. First, there are few substitutes between goods and services. In some instances, it is feasible for consumers to switch from services to goods. For example, rather than consume meals at restaurants (which is service intensive) people may consume meals at home (which is more goods and time intensive). However in most cases, there are no viable goods that may substitute for services like financial services (e.g. banking and insurance), leisure services (e.g. overseas holidays) and education services.

⁹ There are real challenges in estimating the quality of services, which suggest there are upward biases in the price estimates of services (Boskin, Dulberger, Gordon, Griliches, and Jorgenson (1996)

It is worth noting that the literature on Baumol's cost disease mainly focuses on process innovations when considering the manner in which technical change in the manufacturing industries impact consumption patterns. The type of innovation relates to cost-saving measures that enable producers to save resources in the production process. There is also the potential for technical change to create product innovations, which relate to improving the quality and characteristics of goods and services. As has been frequently noted in innovation studies (i.e. Christensen 1997), these changes have the potential to stimulate demand growth and increase consumer's willingness to pay for products. Thus on a more disaggregated level, there are several instances where the impact of product innovation has caused increases in spending (Bils and Klenow 2001B, see also Figure 5).

3.3 Some key differences

This section discusses the some basic differences between Engel's law and Baumol's cost disease in terms of how they impact industries and consumption patterns.

- **Industries.** The main difference between these two forces driving structural change is in which sectors are affected. Engel's law essentially describes demand-driven shifts between food and non-food spending. For the manufacturing and services industries, the impact of Engel's law is positive as the extent of the market grows. In contrast, Baumol's disease describes supply-driven shifts between manufactured goods and services. As a result, it is likely that Engel's Law tends to have a stronger impact on the overall composition of spending in low income economies where the share of household spending on food is considerably larger and the agricultural industry more dominant. Baumol's disease would likely be more relevant among developed economies where the share of household spending dedicated to manufacturing and services is relatively larger.¹⁰
- **Underlying drivers.** Another important difference relates to the underlying mechanism that drives change in consumption patterns. In the case of Engel's Law rising income is the key factor that induces change in consumption patterns as this drives inherent shift in preferences, irrespective of the state of the economy and the

¹⁰ This would also suggest that demand-driven structural change is more relevant for economies experiencing low levels of economic development. Boppart argues that the relative importance of the income effects as a determinant of aggregate structural change decreases over time (2014).

level of technological progress present in the sectors. As a result, Engel's Law is likely to be more universally observable across a wide range of economies. The key enabling factor that drives this change is increasing household income and non-homothetic preferences. In the case of Baumol's disease, this effect takes place not as income rises, but over time as technological change lowers the relative price of manufactured goods. This is a relatively complex process that depends on the extent to which industries invest in R&D, as well as the competitiveness of markets that influence both innovative activity and the extent to which the adoption of new technologies translate into lower prices (Aghion et al. 2005). While these potential inhibitors are likely to be absent in large, developed countries like the US (as discussed in Boppart 2014), they may be a major determining factor in less developed countries. In closed economies where there is a relatively low level of technological progress, low levels of international imports and limited Foreign Direct Investment, the impact on Baumol's disease on consumption patterns could be negligible.

- **Engel Curves.** One common element that these effects share is that both will have a stronger impact on low income households relative to high income households. This is because, in terms of Engel's Law, poor households tend to spend more of their budget on food. In terms of Baumol's disease, poor households are more price elastic (sensitive to price changes) relative to high income households. As mentioned in Section 2.1, many low income households may record zero expenditure for durable goods and other luxuries. The falling price of manufactured goods could stimulate a larger share of households to participate in manufactured goods. This would magnify differences between the observed spending levels of the rich and poor on manufactured goods thereby creating steeper ECs for manufactured goods.¹¹ This may explain why manufactured goods appear to be luxuries in developing countries, but necessities in developed countries. [**Authors note: I can expand on this point more once the empirical analysis of ECs has been completed.**]
- **Magnitude.** A final difference relates to the relative impacts on consumption patterns. While Engel's Law impacts consumption patterns through income effects, Baumol's

¹¹ Only Baumol's law has an impact on the shape of ECs over time. This is because Engel's law is inherently reflected in the shape of food and non-food ECs as these curves describe income effects.

disease impacts work through changing the relative prices of goods for consumers. Thus the final impact each of these effects have on consumption depends on the price and income elasticity of demand. Here it is typically found that income effects have a much larger impact on consumption patterns, relative to price effects (Deaton and Muellbauer 1980, & Lavoie 1994). As mentioned by Clements et al. (2006) allowing consumption to be proportional to income explains about one-half of the total variation in consumption patterns, while using a conventional demand models (that takes into account changes in relative prices) explains a further one half of the remaining one-half. These results suggest that income effects are much more important determinants of consumer spending than relative prices.

4. The broader picture: Consumption vis-à-vis economic development¹²

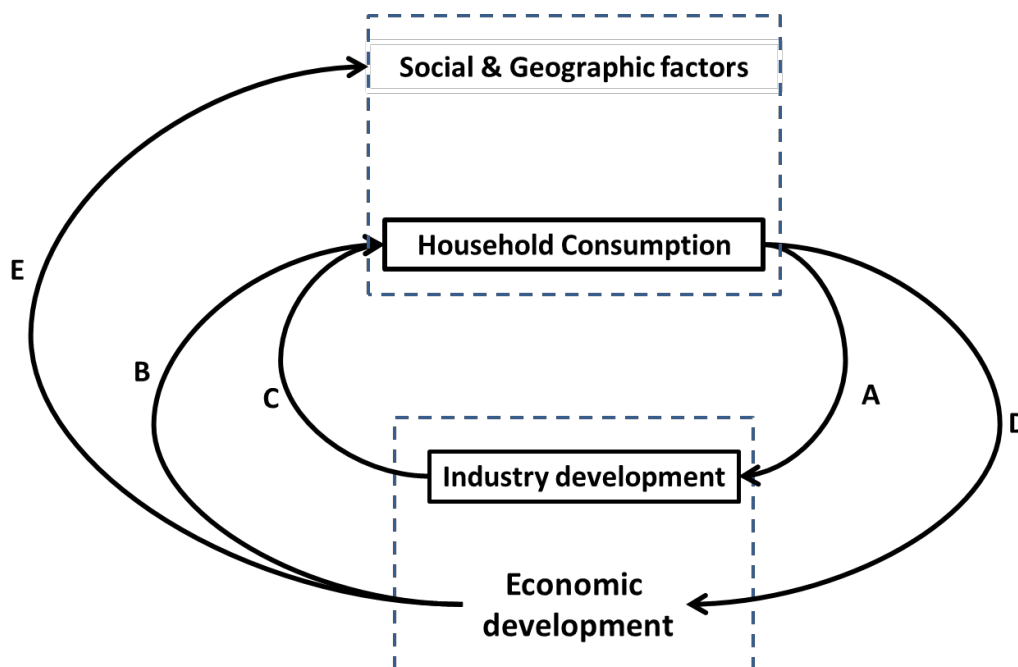
Beyond income and price effects, there is a wide range of factors that shape the character of household consumption patterns across countries. Figure 8 provides a basic guide to these links that will be discussed in detail below. At the heart of macroeconomic models of demand-driven structural change is a positive feedback loop between the composition of household demand and the industrial composition of the economy (as discussed in Section 2). Evolving household consumption patterns stimulate increases in industry production (Arrow A). In the long run, this translates into economic growth and drives up household income (Arrow B), which in turn further changes household consumption patterns.

This circle describes an autocatalytic process through which the natural pursuit of profit via suppliers meeting the existing needs of consumers has a tendency to create the conditions for new phases of economic growth as existing needs become satiated and consumer pursuit new priorities. However, there are many other causal links between a country's consumption and production patterns. For example, Baumol's disease (discussed in the Section 3) is an example of how innovative activity can influence household consumption patterns (Arrow C). These reveal the broad link between consumption processes and production patterns in the economy. They show that income-induced change in the composition of household spending cannot only stimulate shifts in sectoral composition of the economy, but also impact trading patterns, innovative activity, labor supply and

¹² This section addresses the question "how are countries' consumption patterns related?" as well as other questions regarding how certain factors can impact consumption, including: income inequality, country size, trade, demographic change and urbanization.

productivity trends. This section delivers a broad overview of these interlinkages and discusses empirical evidence describing the magnitude of these effects.

Figure 8: Overview of links between consumption and production



4.1 Final Demand and Industrial development (Arrow A)

There are a number of ideas that link household characteristics and the growth rate of final demand to both the scale returns achieved by industries and their level of innovativeness.

A. Scale returns and country size.

In terms of the former, the demand side has long been recognized as a key constraint on the division of labor (Smith 1776, Marshall 1919, Young 1928, Chandler 1977, Langlois 2003). Put simply, the homogeneity and volume of demand can limit the degree to which firms will specialize in production. If the volume of demand is large and the tastes of consumers are relatively homogenous, this encourages economies of scale and specialization in production (Stigler 1951, Sctiosky 1976, Bresnahan and Gambardella, 1998). In contrast, if the volume of demand for a good is small or the character of demand is quite heterogeneous, this will limit the firms' incentive to invest in organizing production efficiently and to invest in skills and training. As such, industries in countries with large populations can be expected realize a greater degree of increasing returns to scale.

There exists micro and macro level empirical evidence to support this conjecture. Recent industry level evidence for the impact that demand has on vertical integration has been reviewed by Bresnahan and Levin (2012). Other studies have found evidence that the most important source of growth in sectoral output is the size of the market (Chenery and Syquin 1975, Chenery et al. 1986). Using a sample of rapidly growing economies over the period from the early 1950s to the 1970s, Chenery et al. (1986) found that in countries with a population over 20 million, expansion of domestic demand accounted for 72-74 per cent of the increase in domestic industrial output. Industries most affected by population size are manufacturing industries such as metals, chemicals and petroleum, paper and automobiles (Chenery and Taylor, 1968). Consequently, manufacturing industries appear to have more weight in the economies of large countries at earlier stages of economic development (relative to small countries). Using 1963-2007 data for 159 economies, including a subset of 107 small economies, Haraguchi and Rezonja (2013) also found that population density had a positive and significant effect on the real value added per capita of textiles, machinery and equipment, motor vehicles, printing and publishing, chemicals and wearing apparel. Among small countries, population density was found to have a negative effect for certain industries including: wood products, basic metals and electrical machinery and apparatus. Elsewhere, Davis and Weinstein (1999, 2003) found that production increased more than one-for-one with local demand for a good in OECD economies and Japan.¹³

The other benefit of large countries is that the industrial composition of the economy is likely to be more diverse than those of small countries. This implies larger volumes of intermediate demand for common inputs such as transport services. Murphy et al. (1989) noted that transport infrastructure plays a key role in enabling both access to markets in large countries, as well as reducing effective production costs, since transport infrastructure like railroads can be shared across industries. This suggests that there are complementarities in production across industries. Therefore large countries that feature a wider range of industries are likely to achieve greater increasing returns relative to smaller countries with a less diversified industrial base.

Finally, the homogeneity of demand can thus have an important impact on the extent to which firms realize economies of scale. As far back as 1919, Marshal argued that much of the American growth in the nineteenth and early twentieth centuries was due to “the homogeneity of the American demand for manufacturing goods”, which enabled

¹³ See also Head and Ries (2001).

standardization and mass production (Marshall 1919: 146 as cited in Langlois 2001:107). It has also been revisited in the recent literature on General Purpose Technologies (see Bresnahan and Gambardella, 1998, Lipsey et al., 1998 and Lipsey et al. 2005). Moreover, if preferences systematically change as income rises, this implies that income inequality could hinder increasing returns as it essentially magnifies differences in the consumption baskets of the rich and the poor (discussed further in Section 4.4).

B. Innovative activity

The growth rate of demand may also impact the level of innovative activity within industries. Schmookler's Hypothesis states that inventive activity within industries is responsive to the pull of demand. Demand growth increases the expected future profits from innovation (Schmookler 1966, Scherer 1982). Empirical evidence for this effect is relatively mixed (Kleinknecht and Verspagen 1990, Fontana and Guerzoni 2008). This is likely due to the complex nature of the innovation process that requires adequate levels of R&D capability at the micro level as well as the correct institutional regimes and incentive structures at the macro level (Nelson and Rosenberg 1993, Freeman 2002, Fageberg and Srholec 2008).

A second theory is the 'Escaping Satiation' hypothesis which states that as household incomes rise and a greater proportion of consumers reach the saturation level of spending on a good, the associated slowdown in demand growth stimulates inventive activity (Witt 2001, Falkinger 2001). This suggests that characteristics of goods will evolve and adopt new features in light of demand saturation. If successful, such product innovations would effectively push the saturation level of spending to higher level. As a result, one could expect the shape of ECs could exhibit systematic instability over time as slowdowns in demand trigger product innovations to take place (Chai and Moneta 2014, Moneta and Chai 2014).

Beyond change in the size of the market and its growth rate, a third hypothesis suggests that the heterogeneity of demand can help influence innovative activity. Expert consumers can help firms develop new products (Teubal 1979, Von Hippel 1986). It is argued that markets in which there are a higher number of specialized consumers have a higher probability of witnessing the introduction of novelties which have been co-developed with consumers (Jeppsen and Molin 2003, von Hippel 2005). Segments of specialized consumer preferences can also form 'niche markets' that can potentially sustain new prototype goods that may not be competitive in the wider mass market. In this way, the

existence of niche markets can play a critical role in industry evolution (Saviotti 1996, Guerzoni 2010, Malerba et al. 2007). As such the heterogenous character of demand is considered to be a type of potential resource or 'capability' that firms can utilize in the innovation process.

Table 4 about here

4.2 Final Demand and the wider economy (Arrow D)

Beyond industries, the evolving character of household demand will affect other important aspects of the economy.

A. Trade patterns

In terms of trade patterns, there are three specific effects. Firstly, the 'Home Market Effects' that suggests countries export those goods for which they possess a large domestic demand (Lindner 1961, Krugman 1980, Chenery 1980). This is a natural corollary to the notion that a large market size fosters the division of labor (see Section 4.1 above). Several studies have sought to empirically verify this effect (Davis and Weinstein 1996, Davis and Weinstein 1999, Head et al. 2002, Hansen and Xiang 2004, Yu 2005, Brühlhart and Trionfetti, 2009).¹⁴ Evidence suggests that the effect is pervasive across a wide range of sectors. However, a ongoing challenge here is distinguishing the impact of market size from other factors that drive economies of scale, such as factor endowments. This appears to remain a largely unresolved issue (Weder 2004).

A second influence of demand on trade flows is the Lindner Hypothesis (Lindner 1961). Recognizing the non-homothetic nature of demand, the Lindner hypothesis postulates that two countries with similar per capita income trade disproportionately with each other because of comparable tastes and preferences. For example, consumers in high income countries tend to spend relatively more on automobiles, relative to consumers in low income countries. As a result, high income countries are more likely to trade automobiles with each other than with low income economies. When considering aggregated trade flows, there is little evidence to

¹⁴ Using OECD data, Davis and Weinstein (1999:395) reported that the responsiveness of net exports to increases in local demand is about 66 per cent. In the same paper, the responsiveness of net exports in Japan to local demand is estimated to be 70 per cent at the prefecture level.

support this idea (Hallak 2010). However, when examining trade flows on the sectoral level, empirical results are more encouraging (Vollrath et al. 2006). Hallak (2010) examined world trade flows for 116 differentiated sectors and finds empirical evidence for more than two-thirds of the observed sectors. This study notes that evidence for the Lindner hypothesis appears to be stronger among high income economies where the demand for high quality consumer goods is higher.

A third channel through which the character of demand can impact trade patterns is that consumers may display a bias toward domestically produced goods over imports. This issue has been briefly considered in the relatively small literature on Armington elasticities that measure how easily households are willing to substitute between home produced and foreign goods given some change in the relative price of imports (Armington 1969, Trefler 1995). In markets where there is a degree of product differentiation among domestic goods, it is argued that consumers will be less responsive to changes in the price of imports. At the same time much depends on how consumers perceive the quality of imports relative to the quality of home-produced goods.

B. Marketization and Labor supply

The extent to which households decide to self-produce certain activities or rely on market-supplied goods and services is a major factor affecting the industrial composition of the economy. There are many sectors that produce goods and services that were formerly produced by households. Examples include childcare, education, cooking, spinning, weaving, sewing, gardening, transportation and trade (Reid 1935, Gronau 1986, Buera and Kaboski 2012b). In more traditional agrarian economies, household production and consumption patterns tended to be relatively autonomous and not reliant on external markets. As noted by De Vries (1994, 2009) autonomous households may have little incentive to earn income if they are able to self-produce many of the goods that are available on external markets. In this way, the emergence of new consumer aspirations and the availability of higher quality goods and services are critical to expanding labor supply by providing households with a greater incentive to work. Recent research into cross-country differences in labor participation rates also find that if households exhibit strong preferences for home production, this will negatively impact labor supply (Freeman and Schettkat 2005).

In terms of demand, the extent of the market tends to grow as rising wages motivates wage earners to substitute away from time-intensive activities, such as cooking a meal at home, in favor of activities that are more reliant on market-supplied goods and services, such as eating at a restaurant (Becker 1965, Gronau 1986). In addition, another source of demand growth for such services could be due to limited cognitive constraints. As skills required for work become more specialized, workers in highly skilled occupations are less likely to possess other skills related to home production (Scitovsky 1976, Earl 1986, Buera and Kaboski 2012A). Therefore, undertaking home-produced activities becomes more costly and household first need to learn and acquire skills in these activities they are able to domestically produce consumption activities.

At the same time, technological improvements in manufactured goods tend to improve the productivity of home production (Buera and Kaboski 2012A, Bridgman 2013). This could result in a ‘demarketization’ effect as certain activities may shift back to being home produced. For example, quality improvement in automobiles triggered a decline in transportation services. The diffusion of household durables such as washers, dryers and vacuum cleaners was accompanied by a decline in domestic servants, laundries and dry cleaners (Greenwood et al. 2005). This suggests that the degree to which marketization grows or declines with economic development critically depends on two countervailing forces: i) rising wages that increase the opportunity cost of home production; and ii) technological improvements that increase productivity of home-production.

C. Wage inequality and factor intensities

The literature on “skills-biased structural change” links evolving household consumption patterns to growing wage inequality in the workforce. In the US economy between 1977 and 2005, the difference in wages earned by workers possessing at least a college degree to workers with high school degrees or less grew by around 50 percentage points. It is argued that this growth in wage inequality is partly due to income-induced shifts in household spending patterns which tend to favor industries that employ high-skilled labour (Buera and Kaboski 2012A, Caron et al. 2014, Buera et al. 2015). Industries employing high skilled labor include: “Financial intermediation”, “real estate and business services”, “Education” and “Health and social work” (Buera et al. 2015). Using a 2004 database of 94 countries and 57 sectors, Caron et al. (2014) also found a strong positive correlation between the income elasticity of goods and the extent to which skilled labor is used in their production.

Table 5 about here

4.3 Industry development and Household Consumption (arrow C)

Supply conditions on the sectoral level impact demand patterns in various ways. As several of these effects have been discussed in previous sections, a brief summary of these follows:

- **Baumol's disease:** the high rate of process innovations in the manufacturing sector lowers the relative prices of goods (relative to services) and subsequently lowers the share of household spending dedicated to manufactured goods.
- **Quality growth.** Improvements in the quality of products and quality improvements may stimulate greater household spending on goods. Bils and Klenow (2001A) estimated that the quality growth of durable goods increases by about 5.8% per year. Product innovations can stimulate growth in demand (see Section 2.3).
- **Welfare effects.** Supply conditions that impact household welfare occur in two possible ways. Firstly, the growth in the variety of goods available implies consumers have a greater freedom to choose between goods and find types of goods that better match their specific preferences. These gains in consumer surplus from variety growth are considered to be substantial (Hausman 1999, Broda and Weinstein 2004, Greenwood and Kopecky 2013). Secondly, the falling price of durable goods driven by process innovations increases consumer welfare by enabling a greater number of consumers to enter the markets and increase the consumer surplus enjoyed by existing consumers (Gowrisankaran and Rysman 2012).

Table 6 about here

4.4 Economic Development and Household Consumption (Arrow B and E)

A. Direct effects

Apart from supply conditions at the sectoral level impacting growth of general demand, there are a number of ways through which economic development has both a direct and indirect effect on the composition and growth rate of household consumption patterns (Arrow B and E, respectively). Direct effects are defined as changes in tastes and income levels. These include:

- **Engel's Law.** As discussed in Section 3.1, rising household income induces shifts in the composition of spending such that the budget share of household spending declines and budget share spending on non-household expenditure items grows.
- **Rising Income Inequality** Income inequality tends to widen as economies develop (Chotikapanich et al. 2012). How does this impact consumption patterns? In terms of the ECs, Section 2 discussed the potential for change in the income distribution that affects both the income elasticity and the underlying number of consumers observed to be consuming a particular good or service. In addition, the tendency for preferences to change with rising income implies that rising income inequality will result in more distinct consumption baskets between the rich and poor in the economy. While low income households may dedicate more spending to basic necessities, the basket of goods and services consumed by the rich is likely to be more orientated toward luxury goods and services (Clements and Gao 2012).

From a theoretical perspective, Foellmi and Zweimüller (2008) hypothesized that changes in household income distribution may also foster the emergence of higher quality products by creating a wealthy class of households willing to pay high prices for new products. Elsewhere, it is argued that rising income inequality could lead to a decline in spending on conspicuous goods (Hopkins and Kornienko 2004). If household demand expands along a hierarchy of goods (Bertola et al. 2006), growing income inequality could also foster declines in the economies of scale as this would lead to expenditure patterns of the population becoming more dispersed across the goods hierarchy. Growing income differences within a population implies that the total expenditure of the population will be dispersed across a wider range of goods servicing linked to segments of the hierarchy of demand. If all household possessed the same income, spending would be more concentrated into the basket of goods and

services preferred by the given income level. In contrast, growing income inequality could generate a reduction in the extent of the market for any given good.

- **Endogenous preferences.** A longstanding hypothesis is that the underlying motivations that drive consumption tend to change with income and are endogenously influenced by economic and market institutions (Bowles 1998, Witt 2001, Fremstad 2016). At low income levels, consumption is motivated by fulfilling basic needs. In contrast, affluent consumers tend to demand entertainment service to avoid boredom (Scitovsky 1976), focus on status goods (Frank 1985, Heffetz 2011) or defensive goods, such as insurance, that are used to avoid pain rather than attain pleasure (Hawtrey 1925). More recently, Witt (2001) has argued that, besides certain biologically-evolved ‘basic needs’ that are fixed and universally shared among consumers, others needs may be acquire through associative and social learning (see also, Gualerzi 2001, 2012). New consumer motivations may also be shaped by the growing complexity of consumer lifestyles and rising information asymmetry between consumers and producers that accompanies the emergence of specialized goods and markets (Earl 1986, Langlois 2001, Earl and Potts 2004, Dulleck and Kerschbamer 2006).

B. Indirect Effects

Beyond driving increases in household income and tastes, economic development can shape the growth rate and composition of household spending in a number of other ways:

- **Urbanization** is a common feature of the economic development process where a greater share of the population is located in densely populated areas (Davis and Henderson 2003). Urbanization has resulted in reduced levels of per-capita calorie consumption and hence per-capita food consumption (Huang and David 1993). For example, urban London workers consumed only 68 per cent of calories per equivalent adult of rural workers consumption at the same level of income (Clark et al. 1995). This is likely due to differences in the nature of work and sedentary lifestyles that results in lower calorie demand among urban residents.

Beyond food, urbanization influences the consumer's lifestyle and spending decisions in a variety of ways. Due to lower search and transaction costs, urban residents generally have greater access to a wider variety of goods and services (Wu 1999). Urban areas feature more retail choices in a wide variety of markets. This results in markets being more competitive, resulting in gains in consumer surplus. Public transport investments also tend to be concentrated in urban areas, lowering spending on private transport (Blow et al. 2004). Moreover, due to the scarcity of land in urban areas, households in densely populated areas tend to spend more on rent or mortgage repayments. On the supply side, the benefits of urbanization have been widely discussed in the literature on agglomeration effects. For firms, being located in cities enables input sharing, technological sharing and the pooling of labor markets (Rosenthal et al. 2003). In terms of the environmental impact, urbanization will slow the growth rate of residential energy consumption in China (Wang 2014).

- **Demographic effects - Family size.** The decline in fertility that is broadly associated with rising household income generates two key implications that have important connotations for household consumption patterns. In developing countries, a key impact of family size on consumption patterns is in the domain of food consumption. Large families tend to spend less on food on a per capita basis relative to small households. Deaton and Paxson (1988) found that this pattern held across a wide range of developed and developing countries, including the US, UK, France, Taiwan Thailand, Pakistan and South Africa. There are a number of likelihood reasons for this, including the realization of economies of scale in food consumption by large households (Nelson 1988).

In developing countries a likely important source of scale economies is home-grown food (Gan and Vernon 2003, Jayasinghe et al. 2016). Small-scale vegetable farming is a common feature of rural life through which families can supplement their monetary income by growing their own food. The International Fund for Agricultural Development estimates that 75 per cent of the world's 1.2 billion poor live in rural areas (IFAD 2011). Of these, an estimated 50 per cent are food producing small-holder farmers (Morton 2007). Because of its time-intensive nature, it seems intuitive that the capacity of large households to grow their own food enables them to realize economies of scale by enjoying relatively lower per capita costs of maintaining a

given material standard of living. Rather than purchase food, large households in rural areas may choose to spend more time growing their own food. As economies develop, the declining family size tends to limit the household's ability to achieve economies of scale in food consumption.

- **Demographic effects - Ageing population.** The world's population is getting older. The number of people over the age of 60 is projected to reach 1 billion by 2020 and almost 2 billion by 2050, representing 22 per cent of the world's population. This effect is spread globally as in nearly every country of the world the share of the population aged 60 is projected to increase (Bloom et al. 2010). As a result, as the population ages, overall spending is likely to decline. Spending by households tends to closely follow income over the lifecycle. Danziger et al. (1982) showed that the elderly spend less than the non-elderly at the same level of income and that the very oldest of the elderly have the lowest average propensity to consume. As personal savings appear to be higher among the elderly, this could lead to an increased demand for financial services.

In terms of how the composition of spending may be affected, studies have shown a declining trend in food intake, in particular a decrease in fat intake among older households (Morley 2001). Other spending shares are set to increase. In almost all OECD countries, the demand for healthcare is projected to increase with increasing share of aged population, followed by energy consumption (except for Japan) and housing expenditure (Martins et al., 2005). Other studies have found that expenditure share on food, health and body care, energy, holiday and travelling expenses, and furniture increases with aging, while expenditure on clothing, transport and communication decline (Zitter 1988, Lührmann 2005).

- **Factor intensities and the shadow price of time.** In many cases, development results in capital-intensive industries emerging as the dominant economic sector. As discussed in Section 4.2, skilled labor and capital are production complements (Krusell et al. 2000). Capital intensive industries tend to feature skilled 'white collar' workers that require more education, training and earn relatively high incomes. This forms the basis of the middle class in many economies. According to household

production theory (Becker 1965), this can indirectly impact consumption patterns by raising the shadow price of time. Households have to choose between spending time working or spending time on domestic activities. As their wages rise, they switch away from time intensive consumption activities towards other activities that are goods or services intensive. For example, working parents earning a high income may choose to send their child to after-school care, rather than take care of the child themselves. They may opt to hire domestic cleaners or eat more meals outside the home rather than do their own cleaning or cooking, thereby saving time. This suggests that there is a positive relationship between size of capital intensive industries, the extent to which they rely on skill-intensive labor and household spending on domestic services, meals out and childcare services (Buera and Kaboski 2015).

- **Natural resource endowment.** From a theoretical perspective, Torvik (2002) argued that due to rent-seeking activities, households in economies with abundant natural resources may experience lower income because only a small proportion of firms have an incentive to operate in an efficient manner. Empirical studies tend to find that a large natural resource endowment is more often associated with high incomes, which leads to a higher demand for consumption goods (Polterovich et al. 2010). Some studies have shown that there has been a significant increase in demand for automobiles, housing and consumer durable goods among those who are directly employed in these natural resources related sectors (Morris et al. 2012). This would suggest that the impact of natural resources on consumption patterns strongly depends on how widely revenue from the natural resources is distributed among the population.

Saudi Arabia is a common example of a resource abundant economy. Government subsidies, public sector job availability, liberal import policies and increased per-capita income via its oil wealth has given rise to consumerism in Saudi Arabia. Its level of imports has increased significantly since the 1970s. Abdu (1992) argued that the discovery of oil in the country led to the rapid growth in the consumption of durable and luxury goods. Demand for domestic services has also been growing in other oil rich middle-eastern countries. The average household owns more than one car and employs a full-time chauffeur to drive their children to school and a full-time maid for household activities (Assad 1991).

Table 7 About Here

5. Conclusion

In sum, significant changes in expenditure patterns which take place as household income rises may transform the industrial composition of the economy. As households become rich and begin to diversify their spending beyond basic necessities, the growth rates of manufacturing and services industries begin to rise. By affecting the growth rate of demand at the sectoral level, innovative activity within sectors and the broader industrial composition of the economy is intrinsically linked to the manner in which the composition of household spending evolves as income grows. This opens up the possibility of a positive feedback loop between the growth of the demand side and growth of the supply side of the economy. As industries grow by serving the needs of consumers, these needs become satiated and household dedicate further increases in expenditure to other consumption priorities that stimulate growth in other sectors. Structural change generates rising household income which creates the conditions for further structural change.

Beyond influencing sectoral growth rates, evolving economy can impact the structure of the wider economy. In terms of trade patterns, the accelerating growth rate in demand may improve the international competitiveness of industries by enabling them to realize economies of scale. Evolving demand can also drive up inequality in wages between skilled and unskilled labor, as rich households tend to dedicate more of their spending to industries that are skill-intensive, such as education and financial services. Moreover, evolving household preferences in relation to whether they rely on home-produced or market produced goods and services will further impact the size of the market in certain service sectors.

As many have noted, this process of co-evolution between the composition of final demand and the industrial composition of the economy is neither inevitable nor smooth (Pasinetti 1981, Saviotti and Pyka 2008, Ciarli et al. 2010). Slowdowns in aggregated demand, in combination with productivity improvements, imply that economic resources need to be reallocated as mature sectors face stagnation and new sectors emerge. In addition, the strength of the links between consumption and production strongly depends on how widely income growth is distributed across sectors, the competitiveness of industries, the extent to

which output is orientated towards domestic markets and functioning and flexible markets for factor resources.

If the evolving nature of demand is indeed exerting an influence on the industrial composition of economies, a deeper question relates to what direction the economy is evolving towards and will demand always continue to expand in the long run (Keynes 1933, Pecchi and Piga 2008)? Thus requires a deeper understanding of the underlying causes responsible for triggering shifts in the composition of household spending. In a nutshell, as households grow affluent their needs change in a way that creates new spending priorities. While at low income levels much of household spending is dedicated to the satisfaction of basic needs, these needs are satiable. As a result, new priorities emerge rapidly and this drives household to diversify their spending and envelop a wider range of goods and services. However, while basic needs are universally shared among households, these new priorities are more unique to specific cultures and more fluid (Chai and Moneta 2012). As a consequence, the spending patterns of high income households are much more volatile and heterogeneous than those of low income households. In terms of the direction of demand evolution, this paper has touched on a number of possible explanations that account for the fact that some goods are luxuries while others are not. These include: i) frequent rates of product innovations that improve the quality of goods; ii) the positional nature of highly visible goods; iii) the rising opportunity cost of time and outsourcing of certain home production activities; and iv) the learning of new needs .

In terms of understanding global development patterns in the era of global free trade, these suggest that a deeper issue may account for differences in growth rates of economies. This deeper issue is the degree to which shifts in demand within an economy are synchronized with those that take place in partner economies (Matsuyama 2000, 2009). The phenomena of demand-driven structural change suggests that a crucial factor in achieving rapid long run economic growth depends on the timing of these shifts in demand and whether or not the changes occur before or after they take place in other economies in the region.

Some of the income-induced changes are not likely to be universally observable. While some of these trends, such as Engel's Law, are widely observed to take place across a range of economies, the emergence of others trends is more conditional on the characteristics of the supply side (e.g. Baumol's cost disease). In addition, the overall impact of demand on the

industrial composition of economies strongly depends on how orientated the economy is to producing goods and services for the domestic market. In small and open economies, structural change is much more likely to be driven by factor endowments and global trends in international trade (Corden 1982). Finally, demographic and urbanization trends also appear to have a major influence on how demand evolves and may in some cases accelerate the rate of demand-driven structural change. Economies with more urbanized populations are likely to possess lower transaction costs and deeper markets that enable the realization of increasing returns. As such, the manner in which income induces changes in household spending patterns will not necessarily follow the same path across all economies. Rather, this expansion is likely to be influenced by the economy's level of openness, urbanization and the demographic features of the population.

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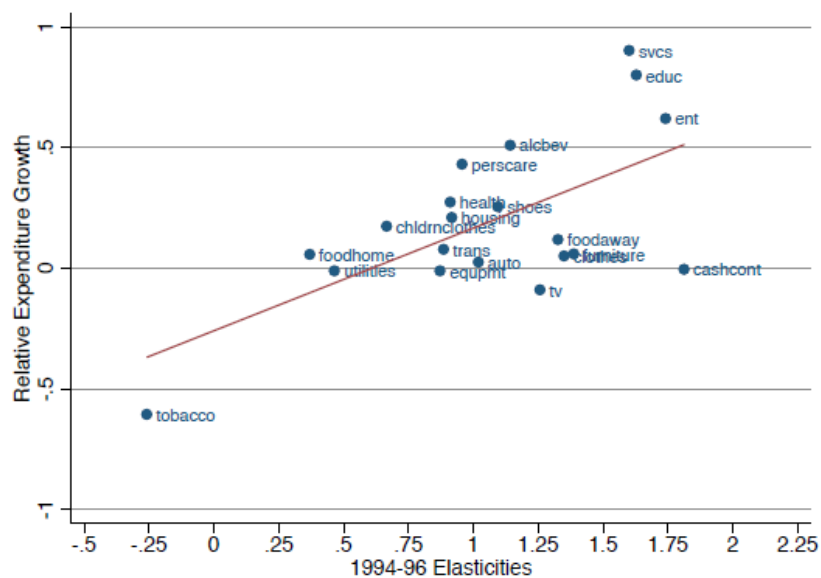
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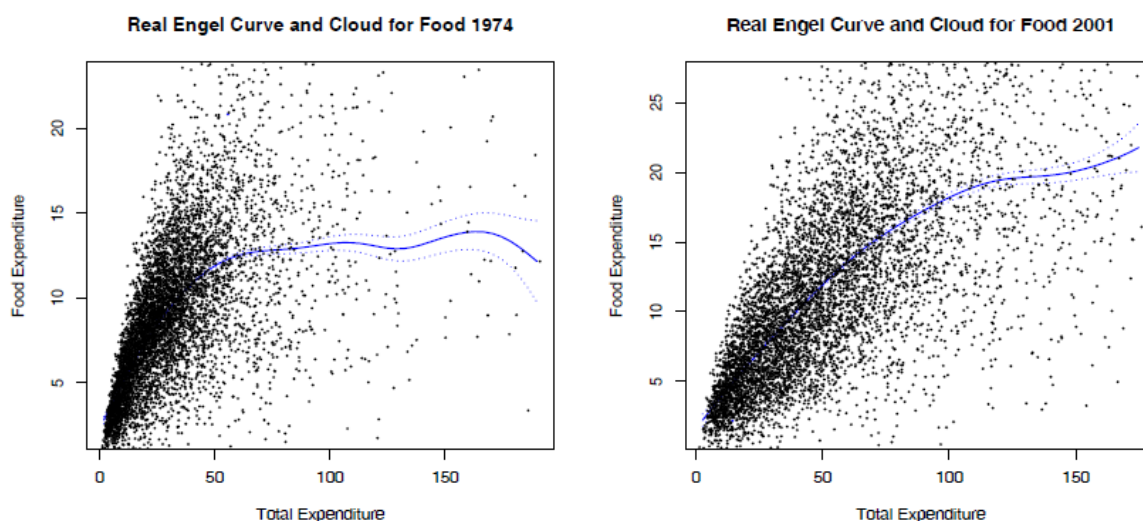
Tables and Figures

Figure 1: Relative expenditure growth and income elasticities for selected Expenditure categories



Note: This figure is a scatter plot of relative (high- versus low-income) expenditure growth over the sample period for each good versus expenditure elasticity. The vertical axis depicts the difference across high-income and low-income households in the log growth in expenditure for each good between 1980/82 and 2008/10. The horizontal axis is each good's estimated expenditure elasticity. The slope of the scatter plot's regression line is 0.425. Source: Aguiar and Bilis (2015).

Figure 2 The Presence of Heteroscedasticity in Engel Curves.



Source: Chai and Moneta (2014).

Figure 3: The demand saturation hypothesis

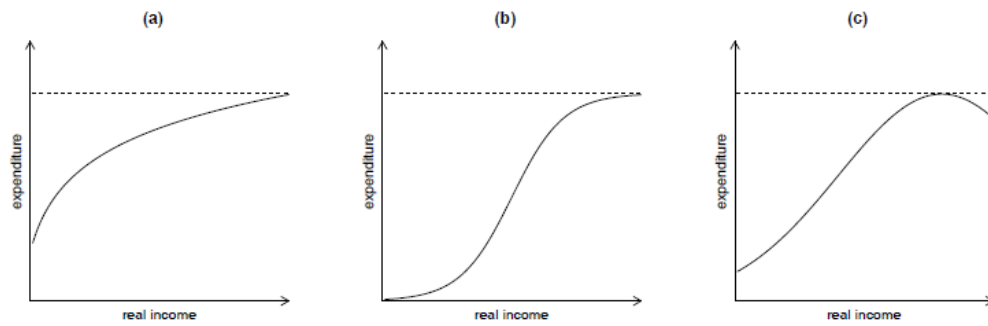


Figure 3: Source (Pasinetti 1981:73). a) is the hypothesized EC for goods ‘necessary for physiological reasons’ (e.g. food); b) is the hypothesized EC for almost all other cases; c) is the hypothesized EC for inferior goods.

Figure 4: The impact on ECs when a greater proportion of ECs reach saturation level

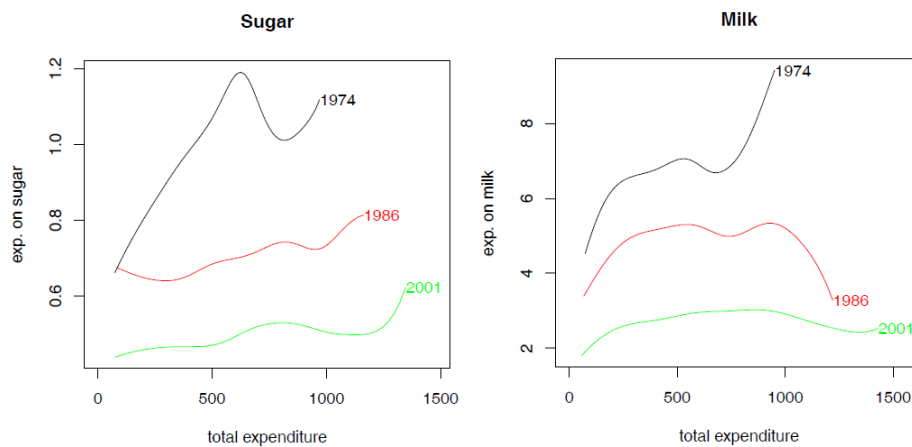


Figure 4: Non-parametrically estimated Engel Curves for Sugar and milk for the UK (Source: Moneta and Chai 2014).

Figure 5: Impact of new innovations on EC – the case of telephones

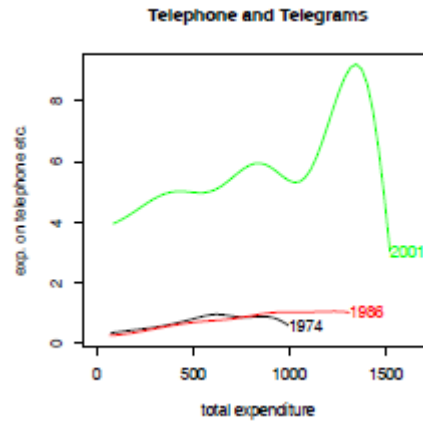
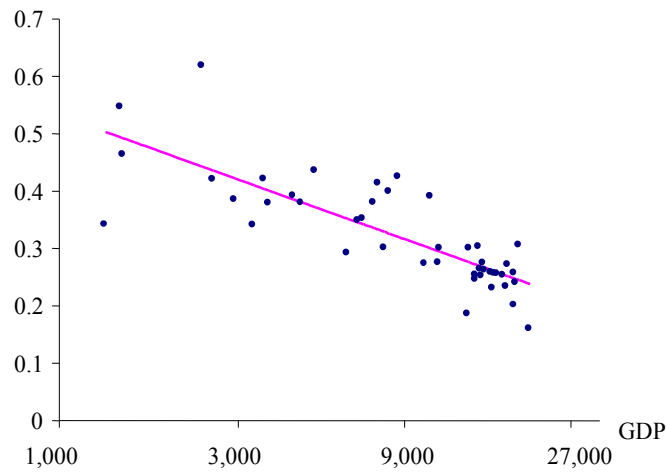


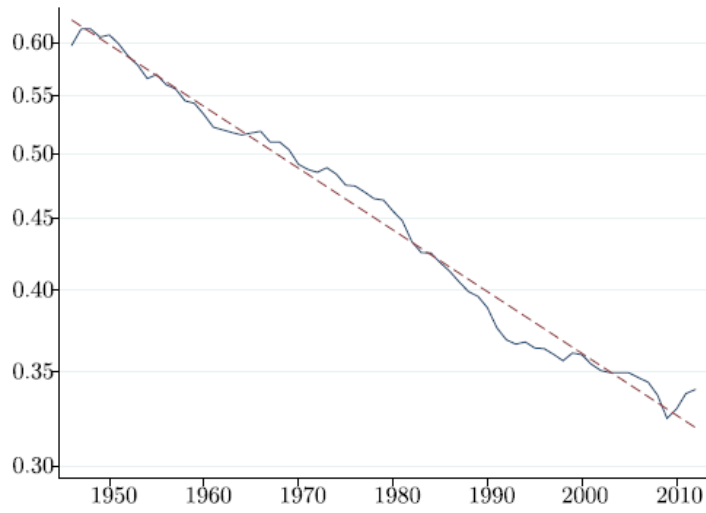
Figure 5: Non-parametrically estimated Engel Curves for Telephone for the UK (Source: Moneta and Chai 2014).

Figure 6: Food budget share and per capita GDP for 45 countries



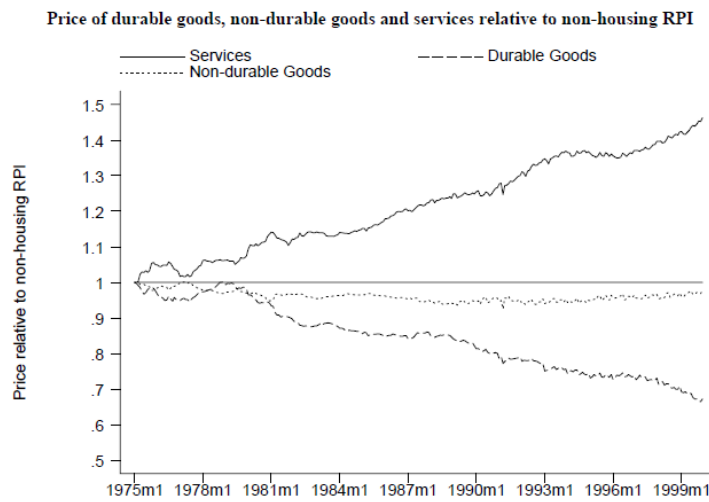
Source: Clements et al. (2006)

Figure 7: Long run trends in US household spending on manufactured goods



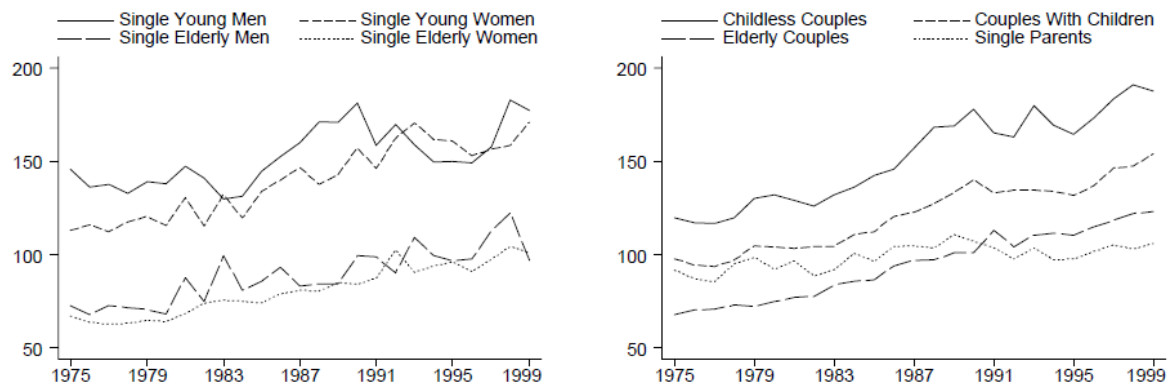
Source: Boppart (2014)

Figure 7: Relative price of Services in the UK, 1975-1999



Source: Blow et al. (2004)

Figure 9: UK Real equivalized weekly non-housing expenditure by gender and age



The vertical axis reports real equiavalized weekly expenditure in pounds.

Source: Blow et al. (2004)

TABLE 1: INCOME ELASTICITIES FOR 8 COMMODITIES IN 45 COUNTRIES

Country	Food	Clothing	Housing	Durables	Medical	Transport	Recreation	Other
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1. USA	.37	1.33	.52	1.59	.33	2.34	1.16	.96
2. Switzerland	.96	1.41	.40	1.44	.79	1.54	1.23	1.06
3. Luxembourg	.43	1.11	.92	1.63	2.03	1.26	-.08	1.08
4. Hong Kong	.48	2.39	.18	1.13	.75	1.16	.68	1.06
5. Canada	.72	1.48	.43	1.23	1.28	1.45	1.36	1.10
6. Germany	.67	1.45	.25	1.50	.63	1.97	.27	1.87
7. Japan	.79	1.81	.30	1.28	.81	1.83	.77	1.42
8. Denmark	.45	1.61	.36	1.50	.27	2.47	.97	1.01
9. Australia	.43	1.27	.34	2.57	1.11	1.20	2.04	1.12
10. Sweden	.74	1.65	.36	1.73	.18	1.95	1.42	.57
11. France	.42	.83	.64	1.85	.15	1.82	1.55	1.48
12. Belgium	.43	1.20	.54	1.75	.81	1.32	.77	1.83
13. Netherlands	.47	1.86	.55	1.90	.69	1.65	1.01	.89
14. Norway	.57	1.22	.46	1.36	1.53	2.20	1.08	.72
15. Austria	.65	1.54	.49	1.31	.40	1.90	.99	.85
16. Singapore	.70	1.32	.45	.72	.64	1.23	1.35	1.40
17. Italy	.70	1.77	.49	1.60	1.01	1.58	.85	.92
18. Iceland	.31	1.15	.47	1.84	.56	2.02	.87	1.23
19. UK	.61	1.01	.30	1.67	.80	1.69	.87	1.47
20. Finland	.56	1.36	.47	1.50	.47	2.08	1.00	1.21
21. New Zealand	.38	1.36	.93	1.55	.71	1.45	.88	1.03
22. Spain	.84	.78	.69	.92	1.71	1.78	1.16	.87
23. Israel	.52	1.87	.25	2.32	.51	2.07	1.81	.66
24. Ireland	.44	2.04	.42	1.72	.83	1.58	1.74	1.43
25. Cyprus	.91	.92	.76	.88	.57	1.65	.45	1.03
26. Taiwan	.75	1.29	.43	1.16	1.08	2.37	1.14	1.84
27. Korea	.91	1.29	.50	1.68	1.04	1.25	.91	1.10
28. Portugal	.27	.26	2.22	.90	.69	2.28	.76	1.07
29. Greece	.52	2.23	.56	1.20	1.89	1.31	1.75	1.23
30. Venezuela	.54	1.39	.99	2.61	.35	1.81	.19	1.21
31. Mexico	.64	1.73	.26	1.26	.75	1.81	1.64	1.01
32. Malta	.62	.97	1.31	1.00	.47	1.26	.79	1.70
33. Puerto Rico	.95	.90	.88	.96	1.22	1.29	1.20	.81
34. Hungary	.77	1.21	1.12	1.49	.91	.75	1.88	.96
35. Fiji	.92	.62	1.04	.48	2.66	1.63	.97	.71
36. Thailand	.63	1.09	.54	1.61	1.22	1.84	1.12	1.14
37. Colombia	.88	1.58	.13	1.55	2.37	1.12	1.07	.83
38. Iran	.59	1.13	1.15	1.42	1.50	1.30	1.61	2.26
39. South Africa	.74	1.40	.32	1.27	.73	1.52	1.11	1.26
40. Ecuador	.88	1.55	.47	1.87	.55	.91	1.00	1.00
41. Jamaica	.71	1.32	.79	1.72	.98	.90	.73	1.63
42. Sri Lanka	.93	1.10	.11	1.81	.85	1.38	.58	1.37
43. Honduras	.95	.31	1.45	1.17	.92	.94	.64	1.08
44. India	.98	1.33	.67	1.49	2.20	.10	2.71	1.22
45. Zimbabwe	1.00	1.08	1.09	.72	.50	2.00	.73	1.13
46. Mean								
Countries 1-25	.58	1.43	.48	1.54	.78	1.73	1.05	1.13
Countries 26-45	.76	1.19	.80	1.37	1.14	1.39	1.13	1.23
Countries 1-45	.66	1.32	.62	1.46	.94	1.58	1.08	1.17

Note: Economies are ranked by income. Source: Clements et al. (2006)

Table 2: changes in US annual consumption expenditure shares, 1901 to 2003.

Expenditure Category	1901		2003		Change in Expenditure share
	US\$	budget share	US\$	budget share	
Food	327	42.5	5,357	13.1	- 29.4
Alcoholic beverages	12	1.6	384	0.9	- 0.7
Housing	179	23.3	13,359	32.8	+9.5
Apparel and Services	108	14	1,694	4.2	-9.8
Transportation*	NA	NA	7,770	19.1	NA
Healthcare	40	5.2	2,384	5.9	+ 0.7
Entertainment	12	1.6	2,069	5.1	+ 3.5
Personal care products and services	NA	NA	526	1.3	NA
Reading and Education	8	1.1	901	2.1	+1
Tobacco	11	1.4	305	0.7	- 0.7
Charity Contribution	10	1.3	1,324	3.2	+ 1.9
Expenditure, all items	769		40,748		+ 5,198

Source: US Department of Labor 2006. 1901 estimate for Transportation and Personal Car products and services were not reported in the BLS as these were reported in a 'miscellaneous' category. Lebergott (1993) roughly estimated the per capita personal consumption of transport represented 4.3 per cent and personal care expenditure represented less than 1 per cent of budget share in 1901.

Table 3: UK consumption expenditure shares between 1975 and 1999.

Expenditure Category	1975		1999		Change in budget share
	GBP	Per cent	GBP	Per cent	
Food	18.29	24.6	17.18	14.8	-9.8
Private transport	6.42	8.6	12.96	11.1	+2.5
motor vehicles	3.34	4.5	9.25	8.0	+3.5
Clothing	7.47	10.1	8.99	7.7	-2.4
Catering	3.08	4.1	7.54	6.5	+2.4
Leisure goods	3.74	5.0	7.22	6.2	+1.2
Household durables	5.86	7.9	7.00	6.0	-1.9
Holidays	1.60	2.2	5.92	5.1	+2.9
Alcohol	4.41	6.0	5.84	5.0	-1
Domestic fuel	4.66	6.2	4.88	4.2	-2
Entertainment	1.91	2.6	3.99	3.4	+0.8
Private health care	1.42	1.9	3.38	2.9	+1
Communications	0.85	1.1	3.09	2.7	+1.6
Tobacco	3.09	4.1	2.52	2.2	-1.9
Education	0.48	0.6	2.01	1.7	+1.1
Public transport	1.75	2.4	1.94	1.7	-0.7
Domestic services	0.90	1.2	1.46	1.3	+0.1
Miscellaneous	5.06	6.8	10.95	9.4	+2.6

Source: Blow et al. (2004)

Table 4: Impact of Demand on Industry activity

Theory	Evidence	Key References
Smith's theorem –the division of labor is limited by the extent of the market.	Stigler 1951, Levy 1984, Head and Ries 2001, Ades and Glaeser (1999). Bresnahan and Levin 2012	S274
Schmookler Hypothesis – Growth in demand stimulate inventive activity within sectors.	Kleinknecht and Verspagen 1990, Fontana and Guerzoni 2008,	Schmookler 1960, Scherer 1982.
Escaping Satiation – Slowdowns in demand growth stimulate inventive activity within sectors. .	Ruprecht, 2005, Chai and Moneta 2014, Moneta and Chai 2014	Witt, 2001, Falkinger 2001
Niche markets and innovation - Specialized demand and niche markets foster innovative activity and benefit industry evolution.	Jeppsen and Molin 2003, von Hippel 2005, Windrum 2005.	Teubal 1979, Von Hippel 1986, Malerba et al. 2007

Table 5: Impact of Demand on the wider economy

Theory	Evidence	References
Home Market Effect – countries export those product for which there is a large domestic demand	Head et al. 2002, Hansen and Xiang 2004, Yu 2005.	Lindner 1961, Krugman 1980, Chenery 1980
Lindner hypothesis - Due to similar preferences, economies with similar income level tend to trade with each other more	Hallak 2010,	Katz
Home bias – consumers may prefer locally produced goods over imported goods.	Trefler 1995, Blonigon and Wilson 1999	Armington 1969
Marketization – household preferences for undertaking economic activities at home rather than relying on market-provided goods and services.	Greenwood et al. 2005, Freeman and Schettkat 2005 Buera and Kaboski 2012A	Reid 1935, Becker 1965, Gronau 1986, De Vries 1994, 2009, Buera and Kaboski 2012B
Skills premium and wage inequality – Evolving demand favors those industries that employ high skilled labor, widening the differences in wages between skilled and unskilled workers.	Buera and Kaboski 2012A, Caron et al. 2014, Buera et al. 2015),	

Table 6: Impact of Demand on the wider economy

Theory	Evidence	References
Baumol’s disease: technological progress in manufactured goods may lower the relative price of goods, leading to a decline of the budget share of manufactured goods	Boppart (2014),	Baumol (1969)
Quality effects – the emergence of Higher quality goods can stimulate increases in consumer demand	Bils and Klenow (2001A, 2001B)	Gordon (1990)
Welfare effects. New product variety enhances the consumer’s freedom to choose	Hausman (1999) Broda and Weinstein (2004), Greenwood and Kopecky (2013)	Bresnahan and Gordon (1998)

Table 7: Impact of Economic Development on Household consumption patterns.

Theory	Evidence	References
Engel’s Law – Rising household income leads to decline in the share of spending dedicated to food	Houthakker 1957, Clements et al. 2006	Engel 1856
Income Inequality – various effects.	-	Foellmi and Zweimüller (2008), (Hopkins and Kornienko 2004)
Endogenous preferences – Economic conditions and market institutions impact preferences	Gualerzi 2001, Fremstad 2016	Sciovsky 1976, Witt 2001,
Urbanization – lower calorie demand, growth in demand for public transport, rent and mortgages.	Blow et al. 2004	Hirsch 1978
Declining Family size – increase in per capita spending on food consumption	Gan and Vernon 2003	Deaton and Paxson 1988
Ageing population – lower overall spending, greater saving. Increase in spending on healthcare, financial services	Morley 2001, Martins et al., 2005	Danziger et al. (1982)
Capital and the shadow price of time – capital intensive industries tend to employ more skilled labor, triggering increased demand for services.	Buera and Kaboski 2015	Buera and Kaboski 2015
Natural Resource endowments – impact highly depends on how widely rents are distributed across population. High incomes can lead to increase demand for imports.	Polterovich et al. 2010	Morris et al., 2012