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THE RISE OF A MIDDLE CLASS IN EAST AND SOUTHERN AFRICA: IMPLICATIONS FOR FOOD SYSTEM TRANSFORMATION

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Abstract: We show five points regarding the middle class in developing East and Southern Africa: (1) 55 per cent of the region's middle class—37 per cent of the 'non-vulnerable' middle class—is rural; (2) 61–83 per cent of the middle class's food is purchased; (3) processed food occupies 70–80 per cent of the class's food expenditure, with similar shares in urban and rural areas; (4) perishable products account for 44–55 per cent of the class's expenditure. Policy attention to processing and to food products 'beyond-grains' thus needs to be 'mainstreamed'; and (5) the import share of food expenditure does not rise with income in urban areas. © 2015 The Authors. *Journal of International Development* published by John Wiley & Sons, Ltd.

Keywords: Africa; middle class; processed food; food imports; urbanisation

1 INTRODUCTION

Literature on the rise and importance of the middle class in developing countries has grown rapidly in recent years (Easterly, 2001; Banerjee & Duflo, 2008; Birdsall, 2010; Ravallion, 2010). For Africa in particular, the African Development Bank has identified the rapid rise of the middle class as an important trend in the region, 'crucial to the continent's economic and political development'. (Ncube *et al*., 2011, 2). They note that by 2010, the middle class rose to 35 per cent of Africa's population, up from 27 per cent in 1980, and nearly

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tripling in size from 126 to 350 million over those three decades, at nearly 20 per cent a year faster than population growth. At 350 million, it is comparable with the middle class in India in size.

Ncube *et al*. (2011) emphasise the heterogeneity of the African middle class. They use a broad definition of $2–20 a day in purchasing power parity (PPP) terms and divide the class into three sub-classes: (1) 60 per cent in the 'vulnerable middle', at $2–4/day, just out of poverty and with the potential to slip back; (2) the rest of the middle class is divided into the 'lower middle' class, with $4–10 a day; and (3) an 'upper middle' class, with per capita consumption of $10–20 a day.

The literature and debate reflect diverse hopes and fears with respect to the emergence of this African middle class. On the one hand, there is a fear that the middle class has such an import-oriented diet that it is a motor for increases in unsustainable imports, as Food and Agriculture Organisation (FAO) (Rakotoarisoa *et al*., 2011) and USDA (2013) posit. And there is a fear that the food habits of the middle class tend toward the highly processed and thus promote obesity and other ills (as posited and explored, although not for Africa, by Popkin (2014), Gomez & Ricketts (2013) and Monteiro *et al*. (2013)[1]).

On the other hand, some harbour hopes that the African middle class, especially in cities, will drive demand for higher-value agricultural products (Badiane, 2014) and demand for value-added food products from the processing sector (Reardon *et al*., 2013), thus creating opportunities for local entrepreneurs and feeding economic growth.

Despite the interest, fears and hopes generated by the rise of the African middle class, there are several important knowledge gaps, and research questions about them, that are relevant to development strategy in general and agrifood system promotion in particular.

First, will a continuation of the recent pattern of growth (its level and distribution over income strata) in the region drive the rapid emergence of a middle class, or has it been so unequal that it will have little effect on the rise of such a class? This is the question on which most empirical debate has been levelled, and we aim to contribute to that debate.

Second, is the African middle class urban? Or is it both urban and rural,[2] and in what proportions? Does this vary over the sub-strata of the middle class? It seems taken for granted in the literature that it is only or nearly exclusively urban. Ncube *et al*. (2011) assert that 'The vast majority of Africa's middle class is likely not to derive its income from agricultural and rural economic activities…' and 'are geographically concentrated in urban areas'. But they do not test that hypothesis nor does any other extant study.

Third, is the African middle class diet more diversified (beyond grains and roots/tubers) or more intensive in processed foods than those of other classes? Does this vary over the sub-strata of the middle class? One might expect at least the diversification, based on Engel's law. However, there have been no systematic empirical studies of African middle class diets from these two angles. The middle class empirical research noted previously does not examine food expenditures. Even studies focusing on middle class expenditures do not study food (such as Chikweche & Fletcher, 2014) or do so only partially, as with the work on South Africa by Nieftagodien and Van den Berg (2007), who estimate Engel's

[1]Monteiro *et al*. use Euromonitor data to provide information on Cameroon and South Africa, the only African countries out of 79 reviewed.

[2]'Rural' and 'urban' in this paper refer only to residence status as classified by national authorities. We acknowledge that many rural residents depend partly or in whole on incomes outside of farming; one-third of all rural labour in the region, by our calculations using a full-time-equivalent approach, is outside of farming. Exploring the implications of this pattern is beyond the scope of this paper. Relatedly, we do not in this paper explore differing consumption patterns within rural areas except by total expenditure level.

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curves for the overall food share for the emerging Black middle class and compute budget shares by decile for grains and meat but do not go further on food. We have found no other authors that address middle class food expenditure behaviour in Africa.

Fourth, and an extension of the second question, is whether the middle class diet is more intensive in imports than that of other income groups, and whether this varies over the sub-strata of the middle class?

The aim of this paper is to address the foregoing four knowledge gaps *cum* research questions. We analyse the food consumption patterns of the middle class in East and Southern Africa (ESA). We use this to draw implications regarding likely changes in diets over the next two to three decades.

We focus on (developing) ESA for two reasons. First, the broadly comparable consumption patterns within the region, most of which are dominated by maize-based cropping systems, allow aggregation of country data with less concern for loss of local detail than if we were focusing on larger or more heterogeneous zones. Second, as the least urbanised region of the continent, documenting the diet transformations unfolding in this region puts a lower bound on what one might find in other areas of the continent.

The paper proceeds as follows. Section 2 presents definitions, data and methods. Section 3 presents findings and is structured into sub-sections corresponding to the aforementioned four research issues/gaps. Section 4 concludes with implications for the African agrifood system and policy.

2 DEFINITIONS, DATA AND METHODS

2.1 Definitions

There is no commonly accepted definition of the middle class across countries. A basic distinction is between relative approaches, for example, the middle class as all households between 75 and 125 per cent of the median income of a country (e.g. Birdsall *et al*., 2000), and absolute approaches with fixed lower and upper bounds (e.g. Banerjee & Duflo, 2008; Ravallion, 2010).

We use the 'absolute lower and upper bounds' approach and set the lower bound for the middle class at the international poverty line of $2/day in 2005 per capita PPP terms, as do Ncube *et al*. (2011), Banerjee and Duflo (2008) and Ravallion (2010). We use the upper bound set out in Ncube *et al*. of $20 a day.

To capture diversity in behaviour across households, we use the strata presented by Ncube *et al*., that is, up to $2 (the poor), $2–4 (the vulnerable middle class), $4–10 (the lower middle class), $10–20 (the upper middle class) and above $20 (the upper class). We expect consumption patterns to differ over the strata of the middle class, as well as between the middle class and the other two classes.

Some criticise a lower bound of $2/day for the middle class because those just above that line are vulnerable to falling back into poverty and are, in part for this reason, unlikely to have the time and energy for the kind of political and social engagement that many associate with a middle class (Birdsall, 2010). Yet the focus of this paper is on food consumption habits, not political engagement; we accept the $2/day lower bound for the simple reason that being in the vulnerable middle class as opposed to the poor class makes a massive difference, because of the ineluctable operation first of Engel's law and then of Bennett's law, in the amount and kind of food that a person can buy. To be specific, a

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median person in the vulnerable middle class, with \$3/day, spends 2.5 times more on food than the median poor person with \$1/day.[3] Considering typical retail maize meal prices in ESA and the calorie content of maize meal,[4] the median poor person could purchase only about 1400 kcal/day, dedicating all her food budget to maize meal purchased at retail, this against an FAO requirement of 2000 kcal/day. In contrast, the vulnerable middle class person could purchase over 3500 kcal if she dedicated all her food expenditure to maize meal. This means, of course, that the vulnerable middle class person will, instead, buy some maize meal along with a range of other products (e.g. vegetable oil, fish, meats and dairy products). The result is not only a better nourished individual but also—and this is the focus of this paper—pressure on the food system to provide this larger volume and broader array of food at affordable prices to more people.

We eschew use of the \$10 and \$13 limits of Banerjee and Duflo (2008) and Ravallion (2010), respectively, for two reasons. First, we wish to look forward two to three decades, during which time the currently tiny fraction of the population above this level will likely become far larger, and because by any standard other than that of today's developing world, \$20/day hardly makes one 'wealthy'.

2.2 Data

Data for the paper come from four sources. First, our household data are from Living Standards Measurement Study (LSMS) data sets across five countries of ESA (Ethiopia 2004/2005, Uganda 2009/2010, Tanzania 2010/2011, Mozambique 2008/2009 and Malawi 2001/2011) and from the 2010 Income and Expenditure Survey data set from South Africa. We use these data to estimate consumption patterns over income classes and to generate a set of expenditure elasticities that we use to project consumption levels and patterns in the region to 2040.[5]

Second, our distributional data (shares of expenditure by 20 tiles) are from the World Bank's PovcalNet database, which uses more than 850 household surveys across 127 developing countries since 1980. We use these data for our six study countries to examine patterns of inequality in the region's growth for use in the baseline scenario of our projection model.

Third, we use the latest (2014) United Nations (UN) data and projections on urban population to establish current rural/urban population shares and as input into the projection model.

Fourth, we use COMTRADE and FAOSTAT trade data linked to a detailed commodity breakdown from the LSMS data sets to estimate gross import shares of food consumption patterns for each of our income strata.

We categorise food items in the LSMS data sets into basic levels of processing (rather than more complex categories related to nutritional content) because our focus is on the

[3]The food shares in total expenditure are, respectively, 0.64 for the poor and 0.54 for the vulnerable middle class (computed from Table 3 as follows). These people thus spend, respectively, \$0.64 and \$1.63/day on food, giving a ratio of 2.52.

[4]The current population-weighted PPP factor for our study countries is 0.37. Typical maize meal prices at retail today are about \$0.60/kg, which converts to \$1.62 using the PPP factor. Maize meal contains about 3500 kcal/kg.

[5]See Annex A (Supporting Information) for more detail on the consumption aggregations and the projection model, including how we used South Africa data to ensure proper curvature in elasticities over income levels.

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Table 1. Main food items from Living Standards Measurement Study data sets by processing/perishability categories

	Unprocessed	Processed, low value added	Processed, high value added
Non-perishable	Legumes	Maize meal	Vegetable oils
	Maize grain	Milled rice	Breads, biscuits
	Others	Sugar	Food away from home
		Others	Others
Perishable	Fresh vegetables	Butchered beef	Food away from home
		Other meat (including poultry)	Dairy
	Fresh fish		Others
	Fresh fruit	Dried/packaged fish	
	Others	Others	

link between consumption patterns and likely demands on the African food system for processing and for activities related to perishables (such as cold chain). We use three levels of processing (unprocessed, low value-added processed and high value-added processed) and perishable versus non-perishable.

2.3 Methods

The mapping of products to categories is given in Table 1. Foods are 'unprocessed' if they undergo no transformation from their original state beyond removal from the plant and (for non-perishables) drying; examples include pulses, whole grains and fresh fruit and vegetables. Processed foods are assigned to the 'low value added' category if they satisfy only one of the following three conditions: have multiple ingredients; underwent physical change induced by heating, freezing, extrusion or chemical processes (i.e. more than simple physical transformation); and have packaging more complex than simple paper or plastic. Examples in this 'low processed' class include maize meal and milled rice. Foods meeting two of the three categories are classified as high value-added processed; examples are breads and other bakery products, industrially packaged vegetable oils and food away from home.

See Annex B (Supporting Information) for a more comprehensive listing of the top 10 food items (by value) in each of the six categories across all data sets, separately for Ethiopia and the rest of the region.[6] Our commodity breakdown for the import analysis consists of 27 commodity groups. The derivation of the expenditure patterns from the LSMS data and the development of the projection model are described in detail in Annex A (Supporting Information).

[6]Our classification scheme maps very closely to that of Monteiro *et al*. (2010), despite the fact that theirs was developed to highlight the nutritional implications of diet change, while our focus was on implications for the structure of the food system. Annex B (Supporting Information) also contains a mapping of items from Table 2 of Monteiro *et al*. (2010) into the food item matrix that we present in our Table 1.

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3 KEY FINDINGS BY ISSUE

3.1 Will a Continuation of Recent Growth Patterns Drive the Emergence of a Middle Class in East and Southern Africa?

Ravallion (2010) shows that the growth of the middle class across the developing world is correlated with gross domestic product growth. Yet the correlation depends on how growth is distributed across households of different income levels. Potts (2013), among others, states that African growth is unequal over income groups, and thus, continued growth of this same level and distribution over income strata will not cause the middle class to broaden over time.

To examine the degree of inequality in African growth and thus its potential effect on the growth of the middle class, we use PovcalNet data to compute quantile ratios of total percentage growth in per capita expenditure among the top and bottom 5, 10 and 20 per cent of the income distributions in Ethiopia, Uganda, Tanzania, Malawi, Mozambique and South Africa. The period of analysis is from the late 1990s or early 2000s to the latest available data, with period length ranging from 5 years (Mozambique) to 13 years (Malawi). We then (1) calculate the distribution and level of growth from PovcalNet, (2) pair them with UN projections of the growth in rural and urban populations over the next 30 years, (3) use the LSMS data from all these countries (except South Africa) to estimate rural : urban total expenditure ratios and (4) project the shares of households in each income class out to 2040. The projection thus reflects a continuation of the patterns of growth, in level and distribution, of the past 15 years.[7]

The results are shown in Table 2. The table shows that, under these assumptions, the poor will fall from over 70 per cent of the population to under 20 per cent, the middle class will rise from its current 27 per cent to nearly three-quarters and the share of the vulnerable middle in the overall middle class will fall by nearly half, from 73 to only 38 per cent. Thus, a continuation of recent growth, as unequal as it may have been, will drive a majority of the population solidly into the middle class by 2040. Of course, declines in the level of growth or sharp increases in its inequality could derail this outcome.[8]

Table 2. Populations and shares by income class in East and Southern Africa (ESA) assuming continuation of rate and distribution of recent expenditure growth, 2010 and 2040 by rural and urban

	2010		2040	
Income class	'000	Share	'000	Share
ESA wide	234 769	100.0%	482 746	100.0%
Poor ($0–2)	169 826	72.3	90 033	18.7
Vulnerable middle ($2–4)	46 985	20.0	139 021	28.8
Lower middle ($4–10)	15 336	6.5	165 870	34.4
Upper middle ($10–20)	2066	0.9	58 493	12.1
Upper (>$20)	557	0.2	29 329	6.1

Source: Authors' calculations and projections from Living Standards Measurement Study household expenditure data, PovcalNet expenditure distribution data and United Nations population data.

[7]Per capita expenditure in real PPP USD increased on average 4.5%/year over the period of analysis. Note that our projection assumes 20% more rapid growth in per capita incomes in urban areas compared to rural.

[8]These rates of poverty reduction are not unprecedented. From 1981 to 2011, the 55 countries classified by World Bank as Upper Middle Income saw their share of population living on less than $2/day fall from 68% to 14%; developing East Asia & Pacific, driven by China, saw this share fall from 93% to 23% over the same period. Source: World Bank Indicators, file si.pov.2day_Indicator_en_excel_v2.xls.

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Table 3. Distribution of East and Southern Africa (ESA) middle class, over urban and rural

		2040		
	2010	BaU	BaU-high	BaU-low
Overall ESA		Population ('000)		
Vulnerable middle class	46 985	139 021	91 731	155 715
Non-vulnerable middle class	17 401	224 363	280 482	119 844
ESA—rural				
Vulnerable middle class	29 135	106 906	73 005	103 330
Non-vulnerable middle class	6458	114 552	183 127	38 918
ESA—urban				
Vulnerable middle class	17 851	32 115	18 726	52 385
Non-vulnerable middle class	10 943	109 811	97 355	80 925
		Per cent		
Rural share in overall middle class	55	61	69	52
Rural share in non-vulnerable middle class	37	51	65	32
Rural share in vulnerable middle class	62	77	80	66

BaU, Business as Usual.
Source: Authors' calculations and projections from Living Standards Measurement Study household expenditure data, PovcalNet expenditure distribution data and United Nations population data.

3.2 Do the Middle Class Reside in Urban Areas Only or Also Rural Areas? How Important Is the Class in Each Area?

Tables 3 and 4 explore the foregoing question. Table 3 shows populations for the vulnerable middle class and the rest of the middle class, overall for ESA and by rural and urban. It does this for 2010 and for 2040 under three scenarios as outlined in Annex A (Supporting Information). Business as Usual (BaU) assumes a continuation of the recent level (4.5 per cent per capita per year) and distribution of growth[9]; BaU-high and BaU-low assume the same distribution of growth but change its level to 6.75 and 2.25 per cent per year, respectively. Three patterns stand out. First, the urban middle class in 2010 was only 45 per cent of the population of the total middle class in ESA—fully 55 per cent of the middle class lies in rural areas. Second, rural areas in 2010 have a 37 per cent share in the non-vulnerable middle class; more than one-third of all non-vulnerable middle class households reside in rural areas. Third, projecting forward under BaU, the rural share of the non-vulnerable middle class rises to 50 per cent; under BaU-high, it rises to 65 per cent. Only under BaU-low does the rural share of the non-vulnerable middle class fall, to 32 per cent. Yet even in this case, one-third of the non-vulnerable middle remains in rural areas. Note also that all three scenarios assume that per capita income growth will be 20 per cent higher in urban areas compared with rural areas; these results do not depend on balanced growth across rural and urban areas.

These results are driven by the fact that most of today's population, and especially the poor and vulnerable middle class population, is in rural areas; it is these people that will be rising into the middle class or upwards within the middle class as incomes rise, and there are simply more of them in rural than in urban areas today and will continue to be over the next 30 years in this region.

[9]This is the scenario that generated the 2040 values in Table 2.

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Table 4. Share of population and expenditure, within urban, rural and total East and Southern Africa (ESA)

	Population (M)		Total annual expenditure (Bn USD)		Annual food expenditure (Bn USD)	
Urban poor	25.9	47.0%	$11.0	17.8%	$6.5	23.9%
Urban middle class	28.8	52.2%	$45.5	73.5%	$19.3	71.3%
Vulnerable middle class	17.9	32.4%	$18.5	29.8%	$9.0	33.1%
Urban upper class	0.4	0.8%	$5.4	8.7%	$1.3	4.7%
	55.1	100%	$61.9	100%	$27.1	100%
Rural poor	143.9	80.1%	$57.3	56.4%	$38.0	62.1%
Rural middle class	35.6	19.8%	$42.9	42.2%	$22.7	37.1%
Vulnerable middle class	29.1	16.2%	$27.9	27.5%	$15.7	25.7%
Rural upper class	0.1	0.1%	$1.4	1.4%	$0.5	0.8%
	179.6	100%	$101.6	100%	$61.2	100%
ESA poor	169.8	72.3%	$68.3	41.8%	$44.5	50.4%
ESA middle class	64.4	27.4%	$88.4	54.0%	$42.0	47.6%
Vulnerable middle class	47.0	20.0%	$46.4	28.4%	$24.7	28.0%
ESA upper class	0.6	0.2%	$6.8	4.2%	$1.8	2.0%
	234.8	100%	$163.5	100%	$88.3	100%

Source: Authors' calculations and projections from Living Standards Measurement Study household expenditure data, PovcalNet expenditure distribution data and United Nations population data.

We conclude that the middle class today is not simply an urban phenomenon and that under reasonable scenarios about the future, it is not likely to become simply an urban phenomenon.

Table 4 shows that while the overall urban middle class has 52 per cent of the total population of urban areas, it makes 74 per cent of total urban expenditures and 71 per cent of urban food expenditures. Its market presence well exceeds its population share because it has higher incomes than the poor. This disproportion is also manifest in rural areas, where it has but 20 per cent of the population but 37 per cent of the food expenditures (purchases plus own production). The surprising finding for the whole of the region is that the middle class is still only 27 per cent of the population but controls fully 54 per cent of the total expenditures and 48 per cent of the food expenditures.

3.3 Does the Middle Class Have Diets More Diversified beyond Starchy Staples and toward Processed and Perishable Foods Than the Other Consumer Classes?

Table 5 shows food budget shares of each of our six categories plus consumed own production, by income class and by rural versus urban. For ease of interpretation, it also shows the shares for low and high processed foods summed across perishable and non-perishable and the shares of perishable and non-perishable summed across processing levels. Note that processed foods and perishable foods overlap, by design, in our classification scheme. Looking on the left side of the table, unprocessed non-perishable foods (largely whole legumes and whole grains; Annex B, Supporting Information) have the lowest share among the six categories in both rural and urban areas. Other than own

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Table 5. Food budget shares by processing and perishability classification, income class and rural/urban (2010)

Income class	Own production (%)	Non-perishable (%)			Perishable (%)			Processed (%)			Non-perishable (%)	Perishable (%)
		Unprocessed	Low processed	High processed	Unprocessed	Low processed	High processed	All	Low	High		
ESA wide	42.0	7.4	10.7	13.6	9.9	8.3	8.1	40.6	19.0	21.7	31.7	26.3
Poor ($0–2)	52.1	7.7	9.9	10.4	8.7	6.7	4.5	31.5	16.6	14.9	28.0	19.9
Vulnerable middle ($2–4)	39.1	8.1	11.2	14.7	10.1	8.6	8.1	42.6	19.8	22.9	34.0	26.9
Lower middle ($4–10)	25.2	7.3	12.6	18.4	12.3	10.8	13.4	55.2	23.4	31.8	38.3	36.5
Upper middle ($10–20)	16.9	4.0	11.9	21.2	12.9	12.9	20.2	66.2	24.8	41.4	37.1	46.0
Upper (>$20)	9.2	0.2	7.0	24.2	12.4	14.9	32.1	78.2	21.9	56.4	31.4	59.4
Rural	56.6	5.9	9.1	9.7	7.3	6.8	4.6	30.2	15.9	14.3	24.6	18.8
Poor ($0–2)	58.8	6.6	8.8	8.6	7.5	6.1	3.5	27.1	14.9	12.2	24.0	17.1
Vulnerable middle ($2–4)	55.6	5.4	9.0	10.5	7.0	7.1	5.3	32.0	16.2	15.8	24.9	19.5
Lower middle ($4–10)	49.9	3.5	10.5	12.1	7.1	9.1	7.8	39.4	19.6	19.9	26.1	24.0
Upper middle ($10–20)	41.3	0.9	11.9	15.6	6.9	11.7	11.8	50.9	23.6	27.3	28.3	30.4
Upper (>$20)	33.2	0.0	12.0	19.4	6.3	13.7	15.4	60.5	25.7	34.8	31.3	35.4
Urban	9.0	11.1	14.3	22.4	15.8	11.6	15.8	64.2	25.9	38.3	47.8	43.2
Poor ($0–2)	12.6	13.9	16.3	21.0	15.9	10.2	10.2	57.7	26.5	31.2	51.2	36.2
Vulnerable middle ($2–4)	10.3	12.8	14.9	22.1	15.6	11.2	13.1	61.4	26.1	35.2	49.8	39.9
Lower middle ($4–10)	7.8	10.0	14.0	22.8	15.9	12.0	17.4	66.3	26.1	40.2	46.8	45.3
Upper middle ($10–20)	3.2	5.7	11.9	24.4	16.2	13.6	24.9	74.8	25.5	49.3	42.1	54.7
Upper (>$20)	0.0	0.3	5.0	26.1	14.6	15.4	38.5	85.0	20.4	64.6	31.5	68.5

ESA, East and Southern Africa.
Source: Authors' calculations from Living Standards Measurement Study household data.

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production, this category is the only one whose share falls consistently with income, to well below 1 per cent among the upper class; within the middle class, it falls by half from the vulnerable middle to the upper middle. This is consistent with Bennett's law and expected.

Perishable unprocessed foods have a larger overall share, and their share rises by almost half moving from the poor to the upper class; from vulnerable middle to upper middle, their share rises by about 30 per cent (from 10 to 13 per cent). This pattern reflects strong rises in the shares of fresh fruit, fresh fish and eggs, and a very modest fall in the share of fresh vegetables, from 11 per cent among the poor to 9 per cent among the upper class (data not shown). This pattern of sharply rising consumption of animal proteins and fruit with rising incomes is also expected from Bennett's law.

The surprising results from this table relate to processed foods. To facilitate interpretation, we also present Table 6, which shows the same data as Table 4 but uses shares of purchased food, not purchased plus consumed own production. Examining the two tables, three results stand out.

First, all processed foods (low and high together across non-perishable and perishable) constitute over 40 per cent of the entire food budget across all households (right side of Table 5) and 70 per cent of purchased food (Table 6). Even more remarkably, the purchased food share of processed foods in Table 5 rises only modestly with income—the poorest households dedicate nearly as much of their purchased food budget (66 per cent) to processed foods as do the highest income households (86 per cent), while the share within the middle class rises only from 70 to 80 per cent.

Second, the share of processed foods in purchased food does not differ between rural and urban areas. This finding is driven by (1) the importance of maize meal (low value-added processed) in rural consumption and (2) the rise of purchased maize meal replacing hand-pounded or custom-milled grain: the share of maize meal in purchased food in rural areas is 8 per cent compared with less than 3 per cent for purchased grain for pounding or grinding into meal. Considering all consumption including own production (Table 5), 30 per cent in rural areas is processed.

Third, highly processed food has more than one-third of the purchased food market (Table 6, final column in Processed) and shows a sharp rise with income in both rural and urban areas. This rise in the share of highly processed food across income classes is driven by sharp rises in nearly every element in this group (Annex B, Supporting Information), especially food away from home, milk and vegetable oils.

Summing across the perishable food sub-categories (final column in each table) shows that these foods also see a sharp rise in their budget shares, from 26 per cent of all food (45 per cent of all purchased food) among the poor to 59 per cent of all food (65 per cent of all purchased) among the upper class. From the bottom to the top of the middle class, these shares rise from 27 per cent of all food (44 per cent of purchased) to 46 per cent of all food (55 per cent of purchased). As suggested from the previous discussion, it is the processed categories of perishables, and especially highly processed, that rise the fastest, by a factor of more than seven (in overall food) from poor to upper class and a factor of 2.5 from vulnerable middle to upper middle. Purchased food shares of highly processed perishables nearly quadruple from poor to upper class and increase by 80 per cent from vulnerable middle to upper middle.

Expenditure elasticities for processed, perishable and processed–perishable foods are also high (Table 7). In both rural and urban areas, the top three elasticities, all above 1.0, are for (in order) perishable highly processed, perishable low processed and non-perishable

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Table 6. Purchased food budget shares by processing and perishability classification, income class and rural/urban (2010)

	Non-Perishable (%)			Perishable (%)			Processed (%)				
Income class	Unprocessed	Low processed	High processed	Unprocessed	Low processed	High processed	All	Low	High	Non-perishable (%)	Perishable (%)
ESA wide	12.8	18.4	23.4	17.1	14.3	13.9	70.1	32.7	37.4	54.7	45.3
Poor ($–2)	16.1	20.6	21.8	18.1	14.1	9.4	65.8	34.7	31.2	58.4	41.6
Vulnerable middle ($2–4)	13.3	18.3	24.2	16.7	14.2	13.4	70.1	32.5	37.6	55.8	44.2
Lower middle ($4–10)	9.8	16.8	24.6	16.5	14.5	17.9	73.8	31.3	42.5	51.2	48.8
Upper middle ($10–20)	4.8	14.3	25.5	15.5	15.6	24.3	79.7	29.9	49.8	44.7	55.3
Upper (>$20)	0.3	7.7	26.7	13.6	16.4	35.4	86.1	24.1	62.0	34.6	65.4
Rural	13.5	20.9	22.3	16.8	15.8	10.7	69.7	36.7	33.0	56.7	43.3
Poor ($0–2)	16.1	21.3	21.0	18.1	14.9	8.6	65.8	36.2	29.5	58.4	41.6
Vulnerable middle ($2–4)	12.1	20.3	23.7	15.9	16.1	11.9	72.0	36.4	35.6	56.1	43.9
Lower middle ($4–10)	7.0	21.0	24.2	14.3	18.1	15.5	78.7	39.1	39.7	52.2	47.8
Upper middle ($10–20)	1.5	20.2	26.5	11.7	20.0	20.1	86.8	40.2	46.6	48.2	51.8
Upper (>$20)	0.0	17.9	29.0	9.4	20.6	23.0	90.6	38.5	52.0	46.9	53.1
Urban	12.2	15.7	24.7	17.3	12.8	17.4	70.5	28.4	42.1	52.5	47.5
Poor ($0–2)	15.9	18.6	24.0	18.1	11.7	11.6	66.0	30.3	35.7	58.6	41.4
Vulnerable middle ($2–4)	14.2	16.6	24.7	17.4	12.5	14.6	68.4	29.1	39.3	55.5	44.5
Lower middle ($4–10)	10.8	15.2	24.8	17.3	13.1	18.8	71.9	28.3	43.6	50.8	49.2
Upper middle ($10–20)	5.9	12.3	25.2	16.8	14.1	25.7	77.3	26.4	50.9	43.5	56.5
Upper (>$20)	0.3	5.0	26.1	14.6	15.4	38.5	85.0	20.4	64.6	31.5	68.5

ESA, East and Southern Africa. Source: Authors' calculations from Living Standards Measurement Study household data.

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Table 7. Expenditure elasticities by food category, rural and urban [East and Southern Africa (ESA)]

Purchased food category	Rural	Urban	ESA wide
Non-perishable			
Unprocessed	0.75	0.51	0.69
Processed low	0.79	0.61	0.75
Processed high	1.07	1.00	1.05
Perishable			
Unprocessed	0.78	0.73	0.77
Processed low	1.14	1.07	1.12
Processed high	1.54	1.38	1.50

Source: Authors' calculations from Living Standards Measurement Study data. Mean of midpoint arc and Tobit–Engel's elasticities.

highly processed. This relationship is robust across the income distribution: the same order of elasticities is maintained across all three terciles of total expenditure in both rural and urban areas (data not shown). Also, bottom tercile households have the highest elasticities in every case. Engel's law predicts that the poorest households would have the highest overall expenditure elasticities for food; the fact that they also have the highest elasticities for highly processed foods must be considered a major surprise.

Using these elasticities and other data and methods as outlined in Annex A (Supporting Information), we present in Table 8 three scenarios for the future evolution of demand in our food item categories. BaU assumes a continuation of the recent level (4.5 per cent per capita per year) and distribution of growth; BaU-high and BaU-low assume the same distribution of growth but change its level to 6.75 and 2.25 per cent per year, respectively.

Five results stand out. First, the share of own production in all food consumption varies hardly at all across the scenarios, falling from 57 per cent in rural areas to within a percentage point of 50 per cent in every case and to a range of 26–29 per cent overall. The table thus focuses on purchased food.

Second, three food categories see little change in their budget shares from 2010 in any of the scenarios: high processed non-perishable and both unprocessed and low processed perishable.

Third, high processed perishable shows the greatest change, rising from 14 to 18 per cent even in the low-growth scenario and up to 29 per cent in the high-growth scenario. Overall, high processed rises in every scenario, while low processed changes little.

Fourth, perishable foods as a group rise in every scenario, from 45 per cent in 2010 to 49 per cent under low growth and 59 per cent under high growth.

Fifth, the overall processed food share is nearly identical in rural and urban areas under all scenarios, with urban households showing higher shares for high processed than rural households. Note, however, that in BaU and BaU-high, highly processed food garners a higher share than low processed food even in rural areas.

3.4 Is the Middle Class's Diet Biased toward Imports Compared with the Other Consumer Classes?

We estimate the share of imports in total food expenditure by our income classes, separately for rural and urban areas. We do this in several steps. First, we convert

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Table 8. Food budget shares in 2010 and 2040 under three scenarios, by food item category, rural and urban

	Non-perishable (%)			Perishable (%)			Processed (%)				
Scenario	Unprocessed	Low processed	High processed	Unprocessed	Low processed	High processed	All	Low	High	Non-perishable (%)	Perishable (%)
All ESA											
2010	12.8	18.4	23.4	17.1	14.3	14.0	70.0	32.8	37.4	54.7	45.3
BaU-low	9.6	16.6	24.8	16.3	14.8	18.0	74.1	31.4	42.8	50.9	49.1
BaU	6.4	14.1	25.5	15.1	15.9	23.2	78.6	30.0	48.6	46.0	54.1
BaU-high	3.9	11.2	25.3	13.8	16.7	28.7	82.2	28.0	54.2	40.5	59.2
Rural											
2010	13.6	21.0	22.4	16.8	15.7	10.6	69.6	36.6	32.9	56.9	43.1
BaU-low	9.6	21.7	24.1	15.3	16.7	12.9	75.3	38.4	36.9	55.4	44.8
BaU	7.1	20.4	24.9	13.5	17.8	16.1	79.4	38.2	41.0	52.4	47.5
BaU-high	5.1	18.8	25.1	12.3	19.2	19.6	82.6	37.8	44.8	49.1	51.1
Urban											
2010	12.2	15.7	24.6	17.4	12.7	17.4	70.5	28.5	42.1	52.5	47.5
BaU-low	9.6	13.7	25.2	16.8	13.8	20.9	73.4	27.4	46.0	48.5	51.5
BaU	6.1	10.5	25.6	15.8	14.9	27.1	78.0	25.4	52.7	42.2	57.8
BaU-high	3.3	7.4	25.5	14.7	15.4	33.8	82.1	22.8	59.3	36.2	63.9

BaU, Business as Usual; ESA, East and Southern Africa.

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Table 9. Food imports as a share of total food expenditure in East and Southern Africa, by income class (2010)

Income class	COMTRADE (%)	FAOSTAT (%)
Region wide	13.9	19.5
$0–2	12.4	17.5
$2–4	14.5	20.6
$4–10	16.0	22.6
$10–20	17.1	23.9
>$20	17.4	23.0
Rural	12.5	17.4
$0–2	11.7	16.3
$2–4	13.1	18.4
$4–10	14.4	20.1
$10–20	16.8	23.5
>$20	18.6	25.2
Urban	17.0	24.3
$0–2	16.9	24.5
$2–4	17.0	24.6
$4–10	17.1	24.4
$10–20	17.3	24.1
>$20	16.9	22.1

Source: Authors' calculations based on COMTRADE and FAOSTAT and Living Standards Measurement Study data for all countries of the East and Southern Africa food staple zones.

COMTRADE and FAOSTAT import data from each country in our analysis to real 2005 PPP terms to be comparable with our expenditure figures. Second, we mapp four-digit and (when necessary) six-digit COMTRADE codes, and the FAOSTAT codes, into a set of 27 commodity groups from the LSMS data to compute import values for each of these groups. Because the expenditure figures are at retail and imports at cost, insurance, and freight (CIF), we assume an average 50 per cent marketing margin from CIF to retail to compare the two.[10] The simple ratio of adjusted import value to estimated expenditure is an estimate of the share of imports in expenditure on each of the 27 groups.

Third, we use these import shares combined with budget shares for each income class on the 27 groups to compute the total value of imports for each income class and divide by expenditure in that class to obtain the share of imports in total food expenditure.

Table 9 reports these shares for each income class and for rural versus urban. The key points are as follows. First, FAOSTAT data give higher import shares but identical patterns across income groups and rural versus urban areas. Second, the share of imports in expenditure is 4 per cent (in COMTRADE) to 7 per cent (in FAOSTAT) higher in urban than in rural areas.

Third, and quite surprisingly given common perceptions, import shares in urban areas do not rise with income, meaning that the urban middle class imports no more, as a share of their consumption, than the urban poor. This pattern of steady net import shares across income classes among urban consumers is driven by substitution away from (imported) wheat and rice towards meat and other products (as predicted by Bennett's law) that have lower import shares.

[10]Note that assuming a different marketing margin will have no effect on the pattern of import shares in expenditure across income classes, which is the focus of this analysis.

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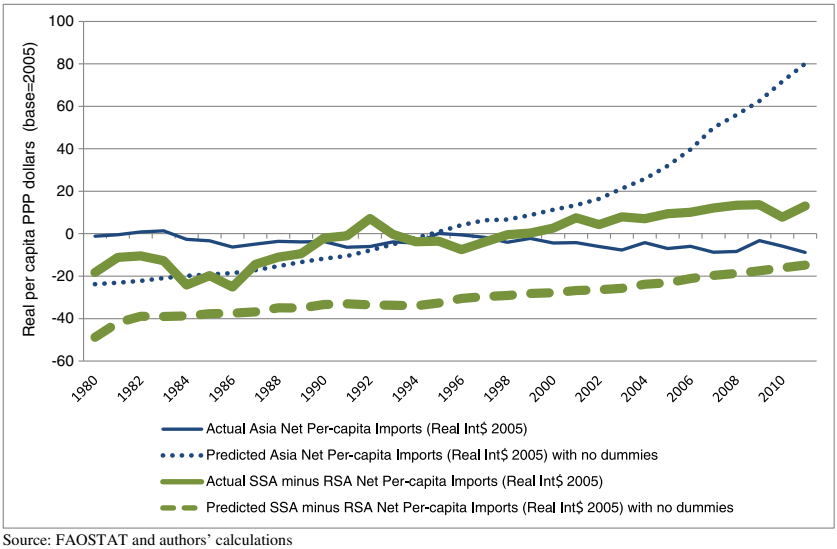
Fourth, because rural population shares are high and import shares rise with income in rural areas, the middle class overall has a higher import share than the poor. Yet this difference is surprisingly small, about 16 per cent on average for the middle class compared with 12 per cent for the poor.

A simple application of these current import shares for each expenditure class to the projected distribution of population across expenditure classes in 2040 (Table 2) suggests only slight rises in the share of imports in consumption over the coming three decades; from 12 to 15 per cent using COMTRADE and from 18 to 21 per cent using FAOSTAT.

Note also that this scenario is consistent with a sharp rise in per capita food imports in the region. Our projection model indicates that, under the baseline scenario of a continuation of the recent level and distribution of growth in the region, combined with UN projections on population growth and the urban share of population, per capita cash expenditure on food will rise by 3.4 times from 2010 to 2040. Under this scenario, the slight rise in the import share in food consumption would lead to a rise of 4.4 times in net per capita food imports. In other words, per capita food imports can rise quite rapidly while changing very little as a share of food consumption.

This analysis, however, abstracts from the question (which is beyond the scope of this paper) of whether the production and marketing systems of the region can keep up with the projected dramatic rise in volume and value added of food demand. This question is urgent in light of slow agricultural productivity growth on the continent. Productivity at farm and post-farm levels will have to increase dramatically to avoid an import surge that goes well beyond what we just discussed.

The possibility of such an import surge can be seen in Figure 1. To generate the figure, we assembled, from FAOSTAT, annual data on the per capita value of net food imports since 1980 from all countries in Latin America, developing Asia (Asia minus Japan, Singapore and South Korea) and sub-Saharan Africa (SSA). We excluded island nations. We then assembled data from the World Bank World Development Indicators for each



Source: FAOSTAT and authors' calculations

Figure 1. Predicted and actual per capita food imports in Africa and Asia, 1980–2010. PPP, purchasing power parity; SSA, sub-Saharan Africa; RSA, Republic of South Africa

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country on structural characteristics that should influence the level of imports but not be (strongly or quickly) influenced by those imports. The question to be answered was 'does SSA import more food than would be predicted from its observable structural characteristics, independent of behavioral/policy/agricultural investment factors?' Specific explanatory variables were as follows:

(1) Real per capita gross national income, in PPP terms (base = 2010);
(2) The country's urban share in total population;
(3) The share of the largest city in total urban population, a measure of the centralisation of urbanisation;
(4) Hectares of arable land per person;
(5) Whether the country is landlocked or not (1 = landlocked, 0 = not); and
(6) Year, to control for secular trends.

We then regressed net per capita real food imports on these variables to generate predicted values for each country, aggregated these regionally and compared predicted with actual imports. The *R*-square for the regression was 0.46. The regression left out variables that capture policy and programmatic decisions that influence the productivity of the countries' food systems and thus their ability to produce, process and distribute the quantity and quality of food demanded by their people. These could include expenditure on agricultural research and extension and a range of public investment including in post-harvest infrastructure such as roads, the electricity grid and market places and in education for its workforce. As a result, the difference between predicted and actual imports should reflect differences in performance on these variables; imports above (below) predicted levels would reflect inferior (superior) performance relative to the average within the overall sample of countries.

We included Latin America in the regression but exclude it from Figure 1 to highlight the difference in performance between developing Asia and developing SSA. Results are striking. They show that predicted per capita net food imports in developing SSA have risen slowly but steadily over the period (somewhat more rapidly since the mid-1990s to late-1990s), driven by the temporal pattern of income gains. Actual net imports have risen at the same pace but have consistently exceeded the predictions based on observed structural characteristics. This pattern is consistent with the continent's low productivity at farm level and throughout its food system. In contrast, Asia's predicted imports (driven by China) grew dramatically over the period and especially since 2000, driven by the region's high income growth. Yet actual imports trended slowly down throughout the period and were far and increasingly below predicted levels through the 2000s, suggesting that some mix of policy, programmatic action and private investment in the food system drove the system-wide productivity gains needed to avoid such an explosion in imports.

Whether Africa repeats Asia's experience or instead sees imports rise rapidly even as a share of consumption depends on whether it adopts the policies and public and private investments that will drive increased productivity throughout its food system, a subject beyond the scope of this paper. Rather, what we have established is that any surge would not be the 'fault' of the African middle class but of general factors shared by all the consumer classes.

4 CONCLUSIONS

This paper focused on the African middle class, already 350 million strong and growing at 20 per cent a year faster than overall population growth. We show it is likely that its growth

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will continue. The paper presented several empirical surprises, shown in current patterns and magnified by a time projection analysis, focused on key issues in the region and used survey data from developing ESA.

First, we showed that whereas it is usually thought that the African middle class is concentrated in urban areas, the survey data show that it is 45 per cent in urban areas of ESA and 55 per cent in rural areas. The 'vulnerable middle class' is important in both the urban middle class (at 60 per cent) and the rural middle class (at 80 per cent). The non-vulnerable middle class is today 37 per cent rural, and this share will decline only if growth falters but even then will remain at about one-third. The middle class has a much bigger share of national food expenditure than its population implies: whereas it is 27 per cent of overall population, it is 48 per cent of food expenditure. As it is growing relative to the poor class, in the future, its consumption habits will determine the majority of the African food markets. This implies that its preferences will drive change in the African food economy.

Second, the data showed that purchased food is already an important share of the overall food economy, and with the rapid growth of the middle class, bound to become increasingly important. Our data showed that for ESA overall (rural and urban), 48 per cent of the poor's food is purchased versus 61–83 per cent over the three sub-strata of the middle class. As the latter grows, there will be rapidly increasing demand for all market services in these countries—logistics, cold storage, processing, wholesale markets and retail services. These results show that these supply chain services are not just a niche subject but now should be a key priority of African governments.

Third, the data showed that processed foods are already important in the ESA diet—but that there is not a big difference between the reliance on processed food by the poor versus the middle class. For overall urban plus rural, for all purchased processed food, the share in expenditure was 66 per cent for the poor versus 70–80 per cent for the three sub-strata of the middle class. The difference was only telling in the high processed foods (31 per cent for the poor versus 38–50 per cent for the middle class). Surprisingly, we found that the processed share in urban areas was just a bit higher than in rural areas—even for the poor and certainly for the middle class. This has two implications. On the one hand, we find that the concern of Popkin (2014) in Asia about the health consequences of the high and growing importance of highly processed foods is relevant also in Africa.[11] On the other hand, the results imply that productivity and employment consequences of the processing sector in Africa should pass from a niche theme to a mainstream policy issue and receive consequent research emphasis.

Fourth, perishable products like fruits, vegetables and meat emerged in the data as important parts of the purchased diet, as high as 42 per cent of the poor's purchases and 44–55 per cent of the three sub-strata of the middle class, overall, with roughly similar findings in urban areas alone. As the middle class grows, the share of these perishable products in the food economy, and their absolute level of consumption, will grow. This argues for 'mainstreaming' the attention to supply chains and productivity of food products 'beyond-grains' in Africa. It also argues for greatly increased attention to and public investment in development of cold chains, logistics and wholesale markets for fresh produce (Tschirley *et al*., 2011) and meat and fish and dairy.

[11]At the same time, we note that not all these 'highly processed foods' are unhealthy and that an explicitly nutrition-focused analysis is needed to better understand the nutritional implications.

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Fifth, it is usual to hear that the rise of the middle class will spur imports of food. A key finding of this paper is that the urban middle class is in fact not already consuming a higher share (than the urban poor) of its diet as imports—and thus by extension, the continuing rise of the urban middle class will not bias the growth path toward more imports. Part of the reason for this is that the middle class's penchant for perishables is met in its great majority by local supply.

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SUPPORTING INFORMATION

Supporting information may be found in the online version of this article.

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