Households' Energy Demand in Ondo State, Using Almost Ideal Demand System (AIDS) Approach.

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Abstract
The study examined households' energy demand in Ondo State between January 2016 to February 2017 while the impact of price and income elasticity of the consumer on their energy demand was also investigated. Almost Ideal Demand System (AIDS) was applied with stratified random sampling technique for empirical analysis. The study examined 223 responses through primary data generated on usage of energy products. The findings showed that electricity (0.98) and kerosene (0.94) are necessities since their coefficients were less than 1. The result further established that Diesel (1.01), Petrol (1.02) and Gas (1.01) are luxuries since their elasticities are greater than 1. The findings revealed that estimated expenditure elasticities were all positive and statistically significant at 5% significant level, indicating that all the selected energy products are normal goods. The study discovered that apart from the major occupations of the respondents, other households' demographic variables were not significant in determining energy demand. Therefore, the study recommended that policy-makers should consider variations in the coefficients of elasticities of each energy product in making policy decisions.

Keywords: *Energy, Households, Demand, AIDS, Elasticities.*

1.1 Introduction

To say that Energy is life is no understatement. It is an indispensable factor and plays key roles in consumption and production process**.** Empirical studies have suggested that energy plays a critical role as compared to other variables included in the production and consumption function for countries which are at intermediate stages of economic development.

In Nigeria, the patterns of energy usage can be divided into industrial, transport, commercial, agricultural, and household sectors. The household sector accounts for the largest share of energy usage in the country - about 65%. The major energy-consuming activities in Nigeria's households are cooking, lighting, and use of electrical appliances. Cooking accounts for a staggering 91% of household energy consumption, lighting uses up to 6%, and the remaining 3% can be attributed to the use of basic electrical appliances such as televisions and pressing irons (ECN, 2005). To this end, Okafor and Uzuegbu (2010) discovered that energy consumption patterns in the world today shows that Nigeria and indeed African countries have the lowest rates of consumption. In spite of this, Nigeria suffers from an inadequate supply of usable energy due low investments in the energy sector which can result in significant economic costs.

Given the potential for energy demand growth in the developing in Nigeria, providing information on the elasticity of those products should prove valuable to policy makers. In spite of this, there is still a dearth of research on energy demand using household data in Nigeria. To the best of authors’ knowledge, there is no piece of research employing household data from Ondo state to investigate energy demand based on the Almost Ideal Demand system modeling. The few available studies such as Ogunleye and Ayeni (2012) only used time series and national data but studies that used micro data at the state level is still lacking.

Against this background, the objective of this study is to investigate the demand for energy in Ondo state using Almost Ideal Demand System approach. Specifically, the study will attempt to look at the impact of price and income elasticity of the consumer on their energy demand. Following this introduction, the rest of the paper is organized as follows: Section 2 focuses on literature review while section 3 outlines materials and methods. Section 4 presents the results and discussion while Section 5 is devoted to the summary and policy implications.

2.1 Literature Review

Energy demand is defined as the requirement for energy as an input to provide product and services to meet an end means. The empirical studies on domestic energy demand in Nigeria are legion. For instance, Bello (2010) examined the impact of wealth distribution on energy consumption in Gombe State, Nigeria. The study uses multinomial logit model to analyse the determinants of household choice of energy used for cooking. Income, size of household, price of stove or cooker, head of household level of education and house wife level of education are variables captured. Empirical results reveal that the choice of cooking energy is mainly determined by income, size of household, and level of education. In a related development, Arowosoge and Faleyimu (2011) investigated household energy for cooking and its determinants in Ado-Ekiti metropolitan area of Ekiti State. Simple descriptive statistics and chi-square test were employed for the analysis. The chi-square results established a significant relationship between income of household and the type of energy used for cooking.

Onyekuru and Eboh (2011) investigated the determinants of cooking energy demand in the rural households of Enugu State. Bivariate probit model was employed for the analysis. Fuel wood and kerosene were the two different cooking fuel options available to the households. Occupation, family size, level of education and income are the variables captured. Empirical results show that occupation and income were the statistically significant factors affecting the choice of cooking energy demand.

Pundo and Fraser (2006) in a study on the analysis of household cooking fuel choice in rural Kenya: The case of Kisumu District uses multinomial logit model to investigate the factors that determine household cooking fuel choice between firewood, charcoal, and kerosene. Variables captured are: age of respondent, household sizes, occupation of the household head and category of food cooked by household, level of education of husband and wife, whether or not the household own the dwelling unit and the nature of the dwelling unit. Empirical results indicate that level of education of husband and wife, type of food mostly cooked, whether or not the household owns the dwelling unit, and whether or not the dwelling unit is traditional or modern type are important factors that determine household cooking fuel choice.

Njong and Johannes (2011), an analysis of domestic cooking energy choices in Cameroon, the study attempts to cast light on the distribution of households by cooking energy types and by region or zone of residence and investigate the main determinants of cooking energy choices in Cameroon. The study employs a multinomial logit model to test the statistical significance of the social and demographic factors that determine household cooking fuel choice in the country. Variables captured are: household size, occupation status, nature of the dwelling houses (proxy by wall materials), education, ownership of the dwelling house, and the distance of household from urban centre.

The study empirical results indicate that the level of education, distance of the household from urban centres, whether or not the household owns the dwelling unit and whether or not the dwelling unit is traditional or modern type are important factors that determine household cooking energy choice. The study also reveals that fuel wood is the principal cooking fuel for the majority of households in Cameroon.

Mekonnen and Kohlin (2008) examined determinants of household fuel choice in major Cities in Ethiopia. The study looks at the fuel choice of urban household in major Ethiopian cities, using panel data collected in2004 and 2006. This study shows the relevance of fuels stacking (multiple fuel use) in urban areas in sub-Saharan Africa. While income is an important variable, the results of this study find other variables such as family size, household location and level of education as important determinants of household fuel choice in Ethiopia.

Farsi Mehdi et al (2007) examine fuel choice in urban Indian households. The study applies an ordered logit model to fuel choices and patterns of cooking fuels in urban Indian households using a large database consisting of 46, 918 observations. The analysis was used to determine the responsiveness of fuel choices to own price, income, price of alternate fuels and variables relating to demographic and geographic characteristics of households.

Bello (2010) researched on Impact of Wealth Distribution on Energy Consumption in Nigeria: A case of selected households in Gombe State. The study uses multinomial logit model to analyse the determinants of household choice of energy used for cooking. Income, size of household, price of stove or cooker, head of household level of education and house wife level of education are variables captured. Empirical results reveal that the choice of cooking energy is mainly determined by income, size of household, and level of education.

In addition, Adetunji, Adesiyan and Sanusi (2007) examined household energy consumption patterns in Osogbo Local Government Area of Osun State. Ordinary least square regression was employed to analyse the data obtained. Age, level of education, occupation, income and household size are variables captured. The regression results indicated that income and household sizes are the significant factors that determined household choice of energy consumption while age, level of education and occupation of household are insignificant. Okunade (2010) assessed charcoal as an alternative energy source among urban households in Ogbomoso Metropolis of Oyo State, Nigeria. Simple descriptive statistics and ordinary least square regression were employed for the analysis. The regression result reveals that age, occupation, level of education and household size are the significant factors affecting household choice of energy used for cooking while income is insignificant. Shittu *et al* (2004) examined the demand for energy among households in Ijebu Division, using the linear logit model. The study found that the influence of education and household size on household energy used were insignificant, while income and age of household heads revealed significant influence. The study concluded that improvement in income would cause increase in demand for firewood alternatives.

In synopsis, most of these empirical research studies centered on household choice of cooking energy using various analytical techniques and methodologies. However, no previous study has investigated energy demand in Ondo State, using Almost Ideal Demand System approach. Against this backdrop, this study fills this gap and contributes to the body of knowledge.

3. Methodology

3.1 Research Design

The research design adopted for this work is the survey research design. It is based on micro data which were collected through the use of structured questionnaire.

3.2 Sampling Technique

Stratified random sampling technique was used to administer the questionnaire. A total of 450 questionnaires were distributed (150 for each Senatorial District in the State). From this, a total of 432 questionnaires were completely filled and returned by different respondents from the study population. These respondents were either household heads or those who had good idea of the household energy expenditure and consumption pattern. However, the sampling unit observed in this study was households.

3.3 Model Specification:

Demand systems are typically specified with expenditure shares as the dependent variables. This study adopts a model similar to that of Poi (2008) but with little modifications. According to him, the empirical specification of the Quadratic Almost Ideal Demand System's budget share equation is generally given as:

$$w_i = \alpha_i + \sum_{j=1}^{k} \gamma ij \ln Pj + \beta_i \ln\left[\frac{m}{P(p)}\right] + \varepsilon_t \text{..(1)}$$

Where:

Wi= household's expenditure share of ith commodity

α_i =Constant parameter

β_i=Estimated expenditure coefficient

γij = Estimated coefficient of prices

m = Household total expenditure of all goods in the demand system

ε_t= Error term.

However, considering the importance of demographic variables such as sex, major occupation and household size on energy consumption in Ondo State, it is important to capture these variables by incorporating them into our model. Hence, equation (1) can be modified as follows:

$$w_i = \alpha_i + \sum_{j=1}^{k} \gamma ij \ln Pj + \beta_i \ln\left[\frac{m}{P(p)}\right] + \sum_{s=1}^{l} \delta iz + \varepsilon_t \text{..........................(2)}$$

Where:

wi= household's expenditure share of ith energy type, for i=1, 2, 3, 4 and 5

w_1= household budget share of diesel

w_2= share of electricity

w_3=share of petrol

w_4=share of Kerosene

w_5= Gas

P_i=price of energy ith (#/killowat), for i=1, 2, 3 and 4

P_1=price of a litter of Diesel in Naira

P_2=price of a Kilowatt of electricity in Naira
P_3= price of a liter of petrol in Naira
P_4= price of a liter Kerosene in Naira
P_5 = Price of Gas in Naira.
m = household's total expenditure on all energy sources in the demand system (N/month)
zi = Socioeconomic variables
Z_1=Major occupation of the respondents
Z_2= Sex (1= male; 0 = female)
Z_3 = household's size (Head count)
ε_t= error term

4.1 Result and Discussion

Table 2 shows the result of the estimated parameters of the Almost Ideal Demand System with demographic variables (major occupation, sex and household size). The parameters (alpha, beta and gamma) are contained in the first column. The second, third, fourth and fifth column represents the coefficient, standard error, Z statistic and the probability values respectively. The five selected energy products (Diesel, Electricity, Petrol, Kerosene and Gas) are listed in order _1, _2, _3 _4 and _5 respectively.

Table 2: Estimated Parameters of QUAIDS without Demographic Variables:

	Coefficient	Std.Error	Z	P>|z|
Alpha				
alpha_1	0.2219	0.0021	100.93	0.000
alpha_2	0.1827	0.0015	117.74	0.000
alpha_3	0.2416	0.0031	76.07	0.000
alpha_4	0.1320	0.0019	67.57	0.000
alpha_5	0.2216	0.0019	113.80	0.000
Beta				
beta_1	0.0025	0.0002	10.19	0.000
beta_2	-0.0020	0.0001	-11.45	0.000
beta_3	0.0047	0.0003	13.33	0.000
beta_4	-0.0075	0.0002	-33.62	0.000
beta_5	0.0023	0.0002	10.65	0.000
Gamma				
gamma_1_1	0.0215	0.000	288.39	0.000
gamma_2_1	-0.0053	0.000	-114.75	0.000
gamma_3_1	-0.0052	0.000	-90.07	0.000
gamma_4_1	-0.0058	0.000	-112.01	0.000
gamma_5_1	-0.0051	0.000	-94.85	0.000
gamma_2_2	-0.0208	0.000	415.16	0.000
gamma_3_2	-0.0054	0.000	-114.68	0.000
gamma_4_2	-0.0047	0.000	-134.73	0.000
gamma_5_2	-0.0052	0.000	-119.09	0.000
gamma_3_3	0.0217	0.000	207.11	0.000
gamma_4_3	-0.0058	0.000	-100.53	0.000
gamma_5_3	0.0052	0.000	-101.35	0.000
gamma_4_4	0.0218	0.000	367.49	0.000
gamma_5_4	-0.0054	0.000	-158.50	0.000
gamma_5_5	0.0210	0.000	234.45	0.000
Rho				
rho_majoccu	-0.05221	0.0104	-5.02	0.000
rho_sex	-0.01927	0.0314	-0.61	0.540
rho_hhsize	-0.00111	0.0080	-0.14	0.890

Author's Regression Output (2016).

From the QUAIDS result, the constant parameters (alphas) represent the average value of budget shares of the selected energy products when income and price effects are equal to zero. The result showed that in the absence of income and price effect, the budget share of diesel, electricity, petrol, kerosene and cooking gas increase by 22 percent, 18 percent 24 percent, 13 percent and 22 percent respectively.

The expenditure terms (beta) are statistically significant in all the four expenditure share equations. It was discovered that apart from electricity and kerosene, every other expenditure elasticities are positive. This implies that diesel, petrol and cooking gas are normal goods while electricity and kerosene are inferior goods. The reason for this could be attributed to the fact that majority of the households studied in Ondo State do not have access to electricity. This reason is that the Southern and majority of the town in the Northern senatorial district of the state have been cut off from the National grid by the electricity distribution company. In terms of magnitude, commodities with expenditure elasticities greater than one are theoretically classified as luxuries while expenditure elasticities less than one are regarded as necessities. In this study, diesel, electricity, kerosene, petrol and gas are regarded as necessities as their coefficients are less than one. The result further indicated that a one percent increase in income will lead to about 0.2 percent, 0.4 percent and 0.2 percent increase in the expenditure share of diesel, petrol and Gas respectively. However, a one percent increase in the income of the household is expected to reduce the expenditure share of electricity and kerosene by 0.2 and 0.7 percent respectively.

In addition, the gamma- parameters captured the responsiveness of demand to variations in relative prices, including both the own price of good (i) and the prices of other goods (j). All the fifteen price effects are significantly different from zero at the 5 percent significant level. This suggests that there is much quantity response to movement in relative prices. For instance, a change in the demand of diesel leads to a systemic change in the price of diesel by 2 percent while a percent change in the demand for electricity leads to a 5 percent change in the price of diesel. Also, a percent increase in the demand for gas leads to a 5 percent decrease in the price of kerosene. This result is not unexpected because Gas and kerosene are substitute.

The coefficient of major occupation, sex and household size (rho) are negatively related to the expenditure share for the selected energy products. However, these demographic variables are not statistically significant in explaining the budget share of disaggregated energy products except that of occupation.

4.2 Price Elasticities

The uncompensated own price and cross elasticity matrix are presented in Table 3. In line with consumer demand theory, all own price elasticities are negative. Negative own price elasticity means that an increase in the price of a commodity results in a decrease in demand for that particular commodity. For instance, when the price of diesel increases by 1 percent, demand for diesel will reduce by 90 percent. Similarly, a percent increase in the price of a kilowatt of electricity will reduce electricity consumption by 88 percent. These are shown in bold figures along the major diagonal in Table 3. The five selected energy product considered in this study are own price inelastic. All cross price elasticities are inelastic as they are all less than one. This indicates that there is a weak response of one energy products to changes in the price of other energy products.

Table 3: Marshalling Price Elasticity Matrix

	Diesel	**Electricity**	**Petrol**	**kerosene**	**Gas**
Diesell	**-0.90**	-0.02	-0.02	-0.02	-0.02
Electricity	-0.02	**-0.88**	-0.02	-0.02	-0.02
Petrol	-0.02	-0.02	**-0.91**	-0.25	-0.02
Kerosene	-0.02	-0.02	-0.02	**-0.84**	-0.02
Gas	-0.02	-0.02	-0.02	-0.02	**-0.9**

Source: Author's Regression Output (2016)

5. Conclusion and Policy Implications:

The paper examined households energy demand in Ondo State based on Almost Ideal Demand System (AIDS). The AIDS model was estimated for the five major energy products that virtually everybody consumes in Ondo State. Specifically, we measured the price and income elasticity of Diesel, electricity, petrol, kerosene and cooking Gas. Our result shown that all own price elasticities are negative which suggests that an increase in the price of any of the selected energy product results in a decrease in demand for that particular product. It was also discovered that the five selected energy products considered in the study are own price inelastic which implies that there is a weak response of one energy product to changes in the price of other. Consequently, the study recommended that policy-makers should consider variations in the coefficients of elasticities of each energy product in making policy decisions.

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APPENDIX

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___/   /   /___/   /   /___/   13.0   Copyright 1985-2013 StataCorp LP
  Statistics/Data Analysis            StataCorp
                                      4905 Lakeway Drive
                                      College Station, Texas 77845 USA
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                                      979-696-4601 (fax)

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Notes:

. *(21 variables, 224 observations pasted into data editor)

. quaids w1-w5, anot(5) lnprices(diesel - cookgas ) expenditure(expdt) demographics( majoccu sex hhsize) noquadratic
> nolog
(1 missing value generated)
(obs = 223)
Calculating NLS estimates...
Calculating FGNLS estimates...
FGNLS iteration 2...
FGNLS iteration 3...
FGNLS iteration 4...

AIDS model
_________________

Number of obs            =        223
Number of demographics   =          3
Alpha_0                  =          5
Log-likelihood           =  5551.8591
```

	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
alpha						
alpha_1	.2219164	.0021988	100.93	0.000	.2176068	.2262259
alpha_2	.1827209	.0015519	117.74	0.000	.1796793	.1857626
alpha_3	.241642	.0031766	76.07	0.000	.235416	.247868
alpha_4	.1320889	.0019549	67.57	0.000	.1282573	.1359205
alpha_5	.2216318	.0019476	113.80	0.000	.2178146	.225449
beta						
beta_1	.0025026	.0002456	10.19	0.000	.0020211	.002984
beta_2	-.0020004	.0001746	-11.45	0.000	-.0023428	-.0016581
beta_3	.0047771	.0003584	13.33	0.000	.0040745	.0054796
beta_4	-.0075844	.0002256	-33.62	0.000	-.0080266	-.0071422
beta_5	.0023052	.0002164	10.65	0.000	.0018811	.0027294
gamma						
gamma_1_1	.02154	.0000747	288.39	0.000	.0213936	.0216864
gamma_2_1	-.0053251	.0000464	-114.75	0.000	-.005416	-.0052341
gamma_3_1	-.0052208	.000058	-90.07	0.000	-.0053344	-.0051072
gamma_4_1	-.0058378	.0000521	-112.01	0.000	-.0059399	-.0057356
gamma_5_1	-.0051564	.0000544	-94.85	0.000	-.0052629	-.0050498
gamma_2_2	.0208301	.0000502	415.16	0.000	.0207317	.0209284
gamma_3_2	-.0054402	.0000474	-114.68	0.000	-.0055332	-.0053472
gamma_4_2	-.0047917	.0000356	-134.73	0.000	-.0048615	-.004722
gamma_5_2	-.0052731	.0000443	-119.09	0.000	-.0053599	-.0051863
gamma_3_3	.0217253	.0001049	207.11	0.000	.0215197	.0219309
gamma_4_3	-.0058079	.0000578	-100.53	0.000	-.0059211	-.0056946
gamma_5_3	-.0052565	.0000519	-101.35	0.000	-.0053581	-.0051548
gamma_4_4	.0218501	.0000595	367.49	0.000	.0217336	.0219666
gamma_5_4	-.0054127	.0000342	-158.50	0.000	-.0054796	-.0053457
gamma_5_5	.0210986	.00009	234.45	0.000	.0209222	.021275
eta						
eta_majoccu_1	.0000208	5.96e-06	3.49	0.000	9.09e-06	.0000324
eta_majoccu_2	-.0000127	4.55e-06	-2.80	0.005	-.0000217	-3.82e-06
eta_majoccu_3	.0000322	.0000106	3.02	0.002	.0000113	.0000531
eta_majoccu_4	-.0000599	.0000159	-3.77	0.000	-.0000911	-.0000287
eta_majoccu_5	.0000197	5.35e-06	3.68	0.000	9.22e-06	.0000302
eta_sex_1	.0000104	.000016	0.65	0.516	-.000021	.0000418
eta_sex_2	-.0000115	.000012	-0.96	0.335	-.000035	.0000119
eta_sex_3	8.75e-06	.0000276	0.32	0.752	-.0000454	.0000629
eta_sex_4	-.0000169	.0000392	-0.43	0.666	-.0000936	.0000598
eta_sex_5	9.28e-06	.0000138	0.67	0.500	-.0000177	.0000362
eta_hhsize_1	-1.02e-06	4.29e-06	-0.24	0.811	-9.43e-06	7.38e-06
eta_hhsize_2	3.62e-07	3.20e-06	0.11	0.910	-5.91e-06	6.64e-06
eta_hhsize_3	3.70e-06	7.40e-06	0.50	0.617	-.0000108	.0000182
eta_hhsize_4	-3.60e-06	.0000105	-0.34	0.731	-.0000242	.000017
eta_hhsize_5	5.67e-07	3.69e-06	0.15	0.878	-6.67e-06	7.80e-06
rho						
rho_majoccu	-.0522169	.0104095	-5.02	0.000	-.0726192	-.0318146
rho_sex	-.0192742	.0314471	-0.61	0.540	-.0809093	.042361
rho_hhsize	-.001114	.008045	-0.14	0.890	-.0168819	.0146539

```
. predict what*

.
. estat expenditure mu*

.
. estat compensated ce*

.
. estat uncompensated ue*

. *Calculate elasticities and standard errors at variable means

. estat expenditure, atmeans

.
. matrix list e(expelas)

e(expelas)[1,5]
            c1          c2          c3          c4          c5
r1    1.011875   .98859555   1.0205567   .94558363   1.0113018

.
. mat expend=e(expelas)

.
. svmat double expend, names(matcol)

. estat compensated, atmeans

.
. matrix list e(compelas)

e(compelas)[5,5]
            c1          c2          c3          c4          c5
r1  -.68262794   .15733189   .21650716   .11940734   .18938167
r2   .19084867   -.7040021   .21138846   .11789903   .18423794
r3   .15737735   .15916514  -.66990527    .1225104   .18065811
r4   .18058252   .14730963   .20939829  -.70824082   .17701038
r5   .19507366   .15883571   .21565139   .12056163   -.6881222

.
. mat pricec =e(compelas)

.
. svmat double pricec, names(matcol)

. estat uncompensated, atmeans

.
. matrix list e(uncompelas)

e(uncompelas)[5,5]
            c1          c2          c3          c4          c5
r1  -.90476651  -.02618344  -.02718039  -.02745933  -.02627535
r2  -.02659141  -.88329545  -.02672252   -.0255864   -.0265378
r3  -.02667035  -.02592469   -.9156937  -.02581596  -.02665138
r4  -.02705307  -.02418299   -.0243938  -.84548538  -.02451838
r5  -.02693915  -.02657545   -.0279081  -.02222184  -.90365723

.
. mat u =e(uncompelas)

.
. svmat double u, names(matcol)

. summarize
```

Variable	Obs	Mean	Std. Dev.	Min	Max
age	224	46.41518	14.82157	20	80
sex	224	.5803571	.4946058	0	1
mstatus	224	1.209821	.5648064	1	4
hhsize	224	3.058036	1.868125	0	9
town	224	2.897321	1.610835	1	5
educatn	224	3.892857	.5579775	0	5
majoccu	224	4.888393	2.119956	1	7
minoccup	224	2.138393	.6307154	1	3
incsource	224	1.4375	.7247235	1	3
diesel	224	8.436649	.4665333	5.857933	9.392662
electricit	224	6.969494	.4435536	6.109248	8.699514
petrol	223	9.337272	1.136051	5.298317	10.71442
kerosene	224	5.584516	.6675934	4.248495	8.006368
cookgas	224	8.185656	.1920445	6.620073	8.630522
expdt	224	38.4719	1.548286	28.90726	41.01765
w1	224	.2195317	.0136979	.1645703	.308665
w2	224	.1813617	.0123548	.155671	.2290108
w3	224	.2408376	.0293279	0	.2826433
w4	224	.1451427	.0161905	.1116261	.2091986
w5	224	.2131263	.0103704	.1871345	.2913761
var21	224	1	0	1	1
what_1	223	.2191317	.0123254	.1639115	.2620724
what_2	223	.181148	.0119511	.1547862	.2214573
what_3	223	.2419178	.0245144	.1682308	.2791369
what_4	223	.1450272	.016148	.1118416	.2098905
what_5	223	.2127754	.0089071	.1891672	.2465883
mu_1	223	1.011937	.0007334	1.009627	1.015346
mu_2	223	.9885308	.0007851	.9866654	.9908811
mu_3	223	1.020702	.0023535	1.017642	1.03023
mu_4	223	.9448687	.006121	.9307658	.9630574
mu_5	223	1.011344	.0005584	1.009406	1.013006
ce_1_1	223	-.6825331	.0066817	-.7048875	-.6537323
ce_1_2	223	.1569929	.0120559	.1302954	.1986591
ce_1_3	223	.2174754	.0238957	.1370319	.2553791
ce_1_4	223	.1191595	.0158352	.0866477	.1816959
ce_1_5	223	.1889052	.0094608	.1604197	.2271864
ce_2_1	223	.1898831	.0125815	.1373078	.2386666
ce_2_2	223	-.703588	.0045551	-.7107903	-.6842917
ce_2_3	223	.2122758	.0235541	.1355985	.2552009
ce_2_4	223	.117635	.0160445	.0859182	.1818839
ce_2_5	223	.1837941	.0096634	.160374	.2255908
ce_3_1	223	.1967998	.0112557	.1442485	.2355555
ce_3_2	223	.1587779	.0106681	.1355553	.1966828
ce_3_3	223	-.6681248	.0139121	-.7054655	-.6411813
ce_3_4	223	.122216	.0152568	.0902474	.1805319
ce_3_5	223	.1903311	.0078158	.1681342	.2174584
ce_4_1	223	.1797065	.0121733	.1301454	.2201409
ce_4_2	223	.1466686	.0121316	.1228703	.1872892
ce_4_3	223	.2038798	.0232489	.1261698	.2432956
ce_4_4	223	-.7064713	.0021679	-.7083924	-.6888645
ce_4_5	223	.1762164	.0088323	.1496881	.2166383
ce_5_1	223	.1945865	.0127307	.1403365	.2426931
ce_5_2	223	.1565372	.0122792	.1300238	.198934
ce_5_3	223	.216658	.0239972	.1396343	.2540456
ce_5_4	223	.1203626	.0159071	.0872225	.1845686
ce_5_5	223	-.6881444	.0049192	-.7004167	-.6653798
ue_1_1	223	-.9042723	.0057747	-.9215267	-.8719833
ue_1_2	223	-.0263169	.0015575	-.0350508	-.0218142
ue_1_3	223	-.0273395	.0017569	-.0364168	-.0218342
ue_1_4	223	-.0276009	.00168	-.0369325	-.0226017
ue_1_5	223	-.0264079	.0015308	-.0349629	-.0218501
ue_2_1	223	-.0267363	.0017393	-.0311242	-.0217116
ue_2_2	223	-.8826675	.0074942	-.9043546	-.8643855
ue_2_3	223	-.0268561	.0016082	-.0307706	-.0220671
ue_2_4	223	-.0257276	.0016674	-.0295226	-.020908
ue_2_5	223	-.0265433	.0017459	-.0308625	-.0214864
ue_3_1	223	-.0268833	.0033114	-.0397477	-.0223303
ue_3_2	223	-.026136	.003275	-.0395457	-.0223674
ue_3_3	223	-.9149937	.0107696	-.928811	-.8713878
ue_3_4	223	-.0258283	.0032739	-.0388769	-.0218316
ue_3_5	223	-.0268603	.0032822	-.0406721	-.0223016
ue_4_1	223	-.0273306	.0028694	-.0349315	-.0194859
ue_4_2	223	-.0244861	.0026418	-.0311557	-.0168671
ue_4_3	223	-.0246346	.0025181	-.0323458	-.0191774
ue_4_4	223	-.8435994	.0160782	-.8903348	-.8015598
ue_4_5	223	-.024818	.0025709	-.0320745	-.0171922
ue_5_1	223	-.027029	.0010923	-.0303993	-.0228608
ue_5_2	223	-.0266637	.0010744	-.030478	-.0228399
ue_5_3	223	-.0280112	.0013335	-.0322738	-.0229342
ue_5_4	223	-.0263109	.001131	-.02987	-.0224786
ue_5_5	223	-.9033288	.004048	-.9182927	-.889985
expendc1	1	1.011875	.	1.011875	1.011875
expendc2	1	.9885956	.	.9885956	.9885956
expendc3	1	1.020557	.	1.020557	1.020557
expendc4	1	.9455836	.	.9455836	.9455836
expendc5	1	1.011302	.	1.011302	1.011302
pricecc1	5	.0161677	.3906917	-.6826279	.1973736
pricecc2	5	-.016672	.3842569	-.7040021	.1591652
pricecc3	5	.035392	.3943076	-.6699053	.2165072
pricecc4	5	-.0455725	.3704467	-.7082408	.1225104
pricecc5	5	.0106848	.3906825	-.6881222	.1908561
uc1	5	-.2023942	.3926381	-.9047665	-.0265914
uc2	5	-.1972325	.3835219	-.8832954	-.024183
uc3	5	-.2043817	.3976377	-.9156937	-.0243938
uc4	5	-.1900741	.3663868	-.8454854	-.0255884
uc5	5	-.2015001	.3925187	-.9036572	-.0245184

```
. graph matrix sex mstatus hhsize diesel

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