Immigration, Enterprises, and Employment in the European Union

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Abstract

We study the effects of ethnic diversity, measured by the share of immigrants in the total population in the EU member countries, on the number of establishments and employment in the EU. We distinguish between different industries and between different groups of source (migrant-sending) countries; i.e., Eastern European Countries (EECs) and Mediterranean Countries (MPCs). We use a panel data that covers the period 1988-2010, and find that migration from MPCs to the EU has a positive impact on both the number of enterprises and employment, especially in light manufacturing industries. Also migration from MPCs to the EU positively affects employment in construction and heavy manufacturing industries. Similarly, migration from EECs to the EU positively affects employment, especially in food and beverages industries.

Keywords: Migration; Enterprises; Employment.

JEL Classification: J2; J61; R23.

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1 Introduction

Immigration is at the forefront of the European Union’s (EU) attention as it is believed it significantly affects economic outcomes for natives through various channels. In this paper, we study the effects of ethnic diversity, measured by the share of immigrants in the total population in the EU member countries, on industry-level employment, and on the variety of products that both natives and immigrants are provided with in these countries. In particular, we are interested in finding out about whether and how the composition of businesses in the EU changes with the influx of immigrants. For example, do we see a change at the product extensive margin, such that new products are made available in the market, especially to cater to immigrants’ demand for some ethnic/diversified goods, or at the product intensive margin such that the share of establishments providing more standardized products increase?

The empirical motivation of our paper is obvious as statistical evidence shows that the immigrant population in the EU is significantly large. At the end of the 1990s, 3.5 per cent of the EU’s population (18 million) was of immigrant origin; see Aubarell and Aragall (2005). In about a decade, this number has almost doubled. According to the News Release by EUROSTAT (2010) — the statistical office of the EU — at the end of 2008, there were 31.9 million foreign citizens living in the EU, of which 20 million were citizens of countries outside the EU. The share of the EU population that is foreign born is currently estimated at around 10 per cent; see EMPL (2011). Not surprisingly, the most populated five EU Member States (Germany, France, Italy, Spain, and the United Kingdom) — comprising approximately two-thirds of the total EU population — have the highest numbers of foreign-born persons, in absolute terms, the total number corresponding to over 75 per cent of the total immigrant population in the EU; see EUROSTAT (2011a). As is discussed in detail, in the following section, not only may immigrants bring in their knowledge of producing some diversified goods, or make trading such goods possible/less costly, but also they may create significant demand for such goods. So we may eventually see some immigration-triggered changes in consumption and production patterns, especially in countries receiving sufficiently large numbers of foreign-born persons.

In general, people move across countries for several reasons. In particular, employment-related reasons are reported as the main motive behind immigration, although migrants
tend to have low levels of income, and/or are exposed to a higher risk of unemployment\(^1\) or are likely to be employed in jobs below their educational qualifications. We shall note that there are some important factors contributing to immigrants’ such employment experiences, such as the non-recognition of migrants’ qualifications and skills which are earned abroad, language barriers, or discrimination, etc.; see EUROSTAT (2011a) and EMPL (2011) for details. These factors may also explain, to some extent, the sectoral distribution of immigrants in the EU Member States.

According to the EU-LFS 2009 data reported by EMPL (2011), immigrants are, generally, under-represented in occupations (i) that require proficiency in the host country language such as office works as they cannot compete with a larger group of native speakers, and (ii) that require high skills/education as in extra-territorial organizations, and education and health sectors, etc. Also they are not well represented in manufacturing, and wholesale and retail trade industries, although there is considerable heterogeneity across countries. On the contrary, they are over-represented in occupations (i) whose demand for skill is sufficiently low such as service sector industries (e.g., hotel and food services, and administrative and support service activities, etc.), and (ii) where the employer is the household (i.e., the household sector that consists in domestic helpers, cleaners and launderers, and personal care workers). Also they are well represented in the construction sector, although as in manufacturing, and wholesale and retail trade industries, the share of immigrant employment in the construction sector shows significant heterogeneity across countries.\(^2\)

In this study, we scrutinize mainly the demand-related impact of the influx of immigrants on the variety of consumption goods available in the host countries. Hence the retail industry, which involves activities that are related to selling goods and services directly to consumers, is given a special emphasis. According to the EU-27, 2008-data, published by Eurostat (2011b), the retail industry is a subgroup of the distributive trades sector, which involves mostly activities that are related to the purchase and resale of goods in the same condition. The distributive trades sector includes 6.1 million enterprises — nearly 30 per cent of the total number of enterprises in the EU non-financial business economy

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\(^1\)Irrespective of the level of education, the unemployment rates of foreign-born persons were systematically higher than for native-born persons, and especially in 2008, this was true in almost all Member States for which data were available (EUROSTAT 2011a: 41).

\(^2\)For a detailed analysis of the sectoral distribution of the share of immigrant employment, see EMPL (2011).
— a large number of which is micro, small, or medium-sized enterprises, and provides employment for almost a quarter of the EU non-financial business economy workforce (32.8 million persons), so it is the largest sector in terms of the number of enterprises, and is almost as large as the manufacturing industry in terms of the number of persons employed. Moreover, the share of the retail industry in total distributive trades is the largest both in terms of the number of enterprises (60 per cent) and of persons employed (55 per cent); see Eurostat statistics, *European Business* (NACE divisions).

We can distinguish between different types of enterprises. In general, establishments that are affiliated with a large firm, which consists of several stores (e.g., chain stores), (i) have complex distribution and inventory control systems, (ii) benefit significantly from scale and scope economies, and (iii) tend to provide more standardized products and offer lower prices. Small, owner-operated/stand-alone stores, however, tend to offer more customized products, and charge higher prices; see Dinlersoz (2004) for details. A positive relationship between the number of small, owner-operated/stand-alone stores and the share of immigrant population, hence, can be associated with the change of the composition of businesses at the product extensive margin, and so with increased diversity of consumption choices. By the same token, if immigrants have higher price elasticities of demand, or if they tend to consume products offered by chain stores, we may well observe a shift of the composition of businesses in the opposite direction.

### 2 Review of the related literature

There is an extensive literature studying potential impacts of immigration in different contexts. One strand of this literature, for example, focuses on the labor-market consequences of immigration, such as whether immigration leads to higher unemployment among natives, especially by crowding out native workers, and whether immigration decreases wages/earnings of native workers, etc. Although the vast majority of research has mainly analyzed the United States (US) there is a growing and recent literature

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3 Micro, small, or medium-sized enterprises (SMEs), which comprise 99.8 per cent of all active enterprises in the EU non-financial business economy are mainly concentrated in the distributive trades sector.

4 The number of persons employed in the non-financial business economy is estimated at about 136.3 million, that is approximately 60 per cent of total employment in the EU.

5 Manufacturing is the largest sector within the EU non-financial business economy, both in terms of the number of persons employed (33 million) and of value added.

6 See Hanson (2009) for discussions of this literature.
studying different EU Member States. Much of this literature is indirectly related to our study as we particularly focus on the immigration-induced changes in product diversity. It is, however, worth noting that, as far as the EU Member States are concerned, in most cases, immigrants do not crowd out native workers — since they mostly complement natives in the labor market — nor do they have a significant negative impact on native workers' wages/earnings, which may have indirectly affected consumption choices; see Kerr and Kerr (2011), Münz et al. (2007), ILO (2010), UNECE (2002), and references therein, for details. To the contrary, migrant workers contribute to job creation in several ways, ranging from entrepreneurship to increasing domestic demand for goods and services (ILO 2010: 60).

Immigrants generally create social networks in the country that they have settled (OECD 2007). Such networks enable immigrants to opt for self-employment, and so to establish micro, small, or even medium-sized enterprises, which are mostly found in the catering industry, services, and retail trade. Immigrant entrepreneurs that are active in such sectors often provide goods and services that are different from those provided by native entrepreneurs, implying that they may well contribute to the diversity of consumption choices (EC 2006, EMN 2005, ILO 2010). Immigrants may also play a crucial role in facilitating trade through a number of mechanisms as they are linked to both their home and host countries by networks; see Gaston and Nelson (2011), Globerman (1995), and Head and Ries (1998) for details. As argued by Head and Ries (1998), immigrants may have superior knowledge of market opportunities, and so in the presence of transaction costs, they may act as trade intermediaries, and may reduce costs, especially associated with foreign trade. Such costs tend to be significantly high, especially when economic.

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7 A survey of the main findings of such studies can be found in UNECE (2002), the United Nations Economic Commission for Europe.

8 According to the European Commision (EC) publication, EC (2006), in Italy, there are some 168,000 such enterprises. In Belgium, in the Brussels area alone, self-employed persons originating from ethnic minority communities are estimated at around 18,000, while for the Flemish region, the number is estimated at about 10,000. In Germany, in 2003, there were 142,000 self-employed non-EU citizens, and in Netherlands, in 2004, 58,000 ethnic entrepreneurs were recorded (p.17).

9 Among different motives, immigrant entrepreneurship is a way to circumvent unemployment, especially given their difficulties in finding paid-employment via formal routes; see e.g., van Delft et al. (2000), Constant et al. (2005), EMN (2005), and OECD (2007).

10 This is referred to as the information bridge hypothesis, according to which immigrants may have superior knowledge of both the home and host country markets, languages, business practices, laws, and special distribution channels, etc., that may help overcome uncertainty stemming from economic and cultural differences, and differences in political environments across countries. Also immigrants may help reduce economic inefficiencies, which may arise especially due to asymmetric information and incomplete enforcement of contracts; see Dunlevy (2006), and Gaston and Nelson (2011).
cultural, and institutional differences across countries are significant, and when such countries trade specialized and/or differentiated goods. Therefore, immigrants may positively affect trading differentiated goods, which may lead to increased variety of consumption goods in the host country.

There is a sizeable literature on the relationship between immigration and trade. Empirical evidence from this literature, which mainly employs gravity-based estimation techniques, suggests that immigration has indeed a significant positive effect on both exports and imports, and the effect appears to be stronger for imports and for specialized/differentiated goods.\footnote{See Wagner et al. (2002), Peri and Requena-Silvente (2010), and Gaston and Nelson (2011), and references therein, for surveys and discussions of the main findings of this literature.} This latter finding implies that immigrants may also change the number of varieties of goods available in the host country, especially through their demand/consumption patterns. The idea here is simple. If immigrants have preferences for certain goods produced in their country-of-origin — which may not be available in the country that they immigrate — and if their demand for such goods is sufficiently large — which is likely to occur in countries where the share of immigrants in the total population is sufficiently large — then they may lead the host country to import such differentiated goods.\footnote{This preference effect is referred to as the transplanted home bias effect as migrants develop tastes before migrating to a country, and as such tastes affect their consumption patterns in the country they immigrate; see White (2007) for discussions of such preference effects.} By the same token, immigrants may have a comparative advantage in producing such goods, with which supply may increase. Though a similar effect may stem from any kind of frictions or preferences leading immigrants to increase labor supply in industries producing such differentiated goods.

In this paper, we also study such preference effects of immigrants, but with a different focus. In contrast to the trade literature mentioned above, we want to delineate how the composition of businesses are linked to the share of immigrants in the total population, which is, surprisingly, a far less studied question in the existing literature, and so with which we would like to contribute to the literature. Our paper is closely related to Mazzolari and Neumark (2011) studying the impact of immigration on the diversity of consumption choices. In particular, they try to explain the changes in the number of establishments of different size with the changes in the share of immigrants in the total population. They use establishment-level data for California between 1992 and 2002, and focus on the retail sector and the restaurant sector, the latter of which is given a special emphasis. They find that immigration is associated with fewer stand-alone retail stores,
and a greater number of chains/big-box retailers, which appears to be contradicting with the diversity-enhancing effect of immigration. Although they find a positive relationship between immigration and ethnic diversity in the restaurant sector, which — as they argue — also may stem from comparative advantage of immigrants in the production of ethnic food from their country-of-origin. To the contrary, Olney (2011) argues that the relationship between immigration and the number and size of establishments is mainly driven by firms’ relocating their production activities, rather than by immigrants’ consumption patterns. He uses a data set that covers 192 U.S. Metropolitan Statistical Areas for the period 1998-2004, and shows that firms respond to immigration both at the extensive margin, which is captured by the net birth rate of establishments, and at the intensive margin, which is captured by the net expansion rate of establishments. According to his results, both the net birth rate and the net expansion rate of establishments increase, especially with low-skilled immigration, the impact of which appears to be much weaker in the non-mobile industries, such as agriculture, mining, and retail trade, than in the mobile industries, such as manufacturing, and finance, professional, management, and administration services. That being said, his data do not allow for calculating immigration by industry, which may have been crucial for an analysis focusing on the production-related effects of immigration in different industries as immigrants are not well represented in those so-called mobile sectors.

Another strand of the literature, to which our paper is indirectly related, looks at how prices change with the influx of immigrants. Lach (2007) employs a store-level price data and shows that the unexpected arrival of a large number of immigrants from the former Soviet Union in Israel, in the 1990s, leads to large and significant reductions in prices. This result may well reflect the demand-side effect of immigration, that is, new consumers (immigrants) have high price elasticity and low search costs, especially vis-à-vis the native population. Given composition effects, we may see the arrival of consumers with different characteristics may offset the demand level changes stemming from the increase in the number of consumers. Bodvarsson et al. (2008) analyze the effects of immigration from Cuba to Miami, especially after the Mariel Boatlift of 1980, and find positive demand effects, that is, retail sales per capita increased with the influx of Cuban immigrants. Bodvarsson and Van den Berg’s (2009) study, which focuses on Hispanic immigration to Dawson County, Nebraska — a uniquely-segmented economy where immigrants work exclusively in an export sector (the meatpacking industry) but consume locally — suggests that immigration can boost local consumer demand. Similarly, Frattini (2008), focus-
ing on immigration inflows in the UK, between 1995 and 2006, shows that the price of 
low-value and everyday grocery goods increased in the same period.

Our study differs from the existing studies such that not only it considers the supply-side 
effects of immigration, but that it treats immigrants as potential consumers of differ-
entiated goods. Also our study is not confined to a particular area in a country, or to 
a single country. We study the EU Member States, which is also a contribution to the 
literature that mainly focuses on the US. Moreover, we distinguish between different indus-
tries and between different groups of source (migrant-sending) countries; i.e., Eastern 
European Countries (EECs), and Mediterranean Countries (MPCs). By employing static 
estimation methods, our study suggests that migration from MPCs to the EU has a 
positive impact on both the number of enterprises and employment, especially in light 
manufacturing industries. Migration from MPCs to the EU positively affects employment 
in construction and heavy manufacturing industries. Similarly, migration from EECs to 
the EU positively affects employment, especially in food and beverages industries. In the 
following sections, we introduce our methodology and data, and present our results. The 
last section provides some concluding remarks.

3 Methodology

The number of establishments equations are of the reduced form, and are derived from 
Mazzolori and Neumark (2009). Its theoretical roots can be found in Ottaviano and 
Peri’s (2006, 2008) studies, which incorporate consumption variety effects into the study 
of the economic benefits of immigration. In particular, they employ a general equilibrium 
model for a small open economy where individuals are differentiated in terms of origin, 
home-born vs foreign-born, and consume two goods, a homogeneous tradable good and 
a differentiated, local, non-tradable good. Home-born and foreign-born individuals are 
assumed to be able to produce different varieties of the non-tradable good. In such a 
model, the non-tradable good can be thought of as a composite basket of local services 
whose supply particularly benefits from diversity.

We follow the same approach, and attempt to directly study the relationship between 
immigration and the composition of products available to consumers. In particular, We 
scrutinize the effects of immigration on product diversity by looking at the industry-level 
number of enterprises and industry-level employment. We use the following two equations
to estimate the impacts of immigration on the number of enterprises and on employment:

\[ enter_j = \alpha_0 + \alpha_1 (EEC/Pop) + \alpha_2 (MPC/Pop) + \alpha_3 (NAV/Pop) + \alpha_4 (REN) + \epsilon, \]

\[ emp_i = \beta_0 + \beta_1 (EEC/Pop) + \beta_2 (MPC/Pop) + \beta_3 (NAV/Pop) + \epsilon, \]

where the variable \( enter_j \) and \( emp_i \) are the number of enterprises and employment in industry \( j \) and \( i \), respectively, and \( EEC/Pop, MPC/Pop \) and \( NAV/Pop \) are the share of immigrants from EECs and from MPCs, and the share of native population in total population, respectively, and \( REN \) is the total renumeration paid to employees. These equations are also estimated by using the changing rates of the variables.

We use a panel-based approach so as to deal with unobserved country-pair heterogeneity, because conventional cross-section estimation techniques fail to model such heterogeneity, and so may yield biased estimates; see Cheng and Wall (2005) and Carrre (2006) for details. Cross-section specifications also fail to properly account for possible omitted variables bias; see De Benedictis and Taglioni (2011) for discussions. The two commonly used panel estimation techniques are the fixed-effects (FE) and the random-effects (RE) estimation methods. The main difference between the two methods is that the FE method allows country-pair individual effects to be correlated with regressors, whereas the RE method assumes that individual effects are uncorrelated with all regressors. As the FE method transforms data into deviations from individual means, ignoring the between-groups variance, it cannot provide estimates for the coefficients of time-invariant regressors such as distance. Although this is a disadvantage, an FE estimator is unbiased and consistent in the presence of correlation between individual effects and regressors, whereas the RE estimator is not. The common practice to choose which model to use is to employ a Hausman specification test, as suggested by Hausman (1978). We follow this strategy such that we first employ both the FE and RE models when estimating the effects of immigration on product diversity, then we employ a Hausman test.

4 Data and Results

Our migration data covers the period 1988-2010, and provides information on the number of immigrants in the EU. We distinguish between immigrants in terms their country of birth. So we have immigrants whose home country either belongs to the group of MPCs or to that of EECs. Also we distinguish between immigrants in terms of gen-
order and age. That said, the migration variable used in the econometric estimation includes the total number of immigrants. We extract our data mainly from two data sources, http://ec.europa.eu/eurostat from which we collect our migration data, and the OECDs Structural and Demographic Business Statistics from which we collect the enterprises and employment data. We shall note that the latter data source provides information at a very detailed sectoral level, especially on turnover, value-added, production, operating surplus, employment, labor costs and investment. The breakdown by industrial sector, including services, is supplemented by a further breakdown into size classes. The database also includes business demography statistics, such as enterprise birth, death and survival rates, as well as the number of high-growth enterprises and gazelles, especially from 1995 onwards.

We look at the relationship between migration and product diversity, both in terms of employment and the number of enterprises. We consider seven industries: (1) mining and quarrying, (2) food products, beverages and tobacco, (3) light manufacturing, (4) heavy manufacturing, (5) electricity, gas and water supply, (6) construction, (7) wholesale and retail trade, hotels and restaurants. Dependent variables (employment and the number of enterprises) are specified first as levels, then as the rates of change, and independent variables are adjusted accordingly. The FE and the RE models are estimated, and then a Hausman specification test is performed. Therefore, eight models for each industry are estimated and, in total, 56 econometric estimations are carried out. We shall note that, in almost all cases, the RE models are rejected. So we mainly focus on the results of the FE models, although, in some cases, we present also the results of the RE models.

Table 1 summarizes our findings from the estimation of the industry-level number of enterprises. In Table 1 the signs, (+) and (−), mean positive significant and negative significant, respectively. As for the variables, Y1 stands for the number of enterprises, and X1, X2, and X3 stand for the share of immigrants from EECs and from MPCs, and the share of native population in total population, respectively. X4 is the total renumeration paid to employees. The model is also re-estimated by substituting X5, the total population including migrants, for X3, and the results are included in the lower section of the table. As is given by Table 1, immigrants from MPCs have a positive impact on the number of enterprises, especially in light manufacturing industries. That said, immigrants from EECs have a negative impact on the number of enterprises, especially in electricity, gas and water supply industries. As for the impact of total renumeration paid to employees on the number of enterprises, our results from the model in which X3 is considered suggest
<table>
<thead>
<tr>
<th>Industries</th>
<th>Fixed effect</th>
<th>Random effect</th>
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<tbody>
<tr>
<td>1 Mining and Quarrying</td>
<td>Y1</td>
<td>X1</td>
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<tr>
<td>2 Food Products, Beverages and Tobacco</td>
<td>Y1</td>
<td>+</td>
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<tr>
<td>3 Light Manufacturing</td>
<td>Y1</td>
<td>+</td>
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<tr>
<td>4 Heavy Manufacturing</td>
<td>Y1</td>
<td>+</td>
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<tr>
<td>5 Electricity, Gas and Water Supply</td>
<td>Y1</td>
<td>+</td>
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<tr>
<td>6 Construction</td>
<td>Y1</td>
<td>+</td>
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<tr>
<td>7 W/sale, Retail Trade, Hotels and Restaurants</td>
<td>Y1</td>
<td>+</td>
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</tbody>
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Table 1: Results – the number of enterprises
<table>
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<tr>
<th>Industries</th>
<th>Fixed effect Variables</th>
<th>Random effect Variables</th>
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<tbody>
<tr>
<td></td>
<td>X10</td>
<td>X11</td>
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<tr>
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<td>Food Products, Beverages and Tobacco</td>
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<td>Construction</td>
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<td>W/sale, Retail Trade, Hotels and Restaurants</td>
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<td>W/sale, Retail Trade, Hotels and Restaurants</td>
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Table 2: Results – employment
Table 3: Results – the rates of change in employment

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<td>Electricity, Gas and Water Supply</td>
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<td>Construction</td>
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<td>W/sale, Retail Trade, Hotels and Restaurants</td>
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Table 3: Results – the rates of change in employment
a positive relationship, especially in construction, wholesale and retail trade, hotels and restaurants, and electricity, gas and water supply industries. Also, in the model in which the total population including migrants is substituted for the share of native people in total population we find that the impact of the total population including migrants on the number of enterprises is negative in food products, beverages and tobacco industries, and is positive in electricity, gas and water supply industries.

We summarize our estimation results for the impact of immigration on industry-level employment in Table 2. As before, in Table 2, the signs, (+) and (−), refer to as positive significant and negative significant, respectively. As for the variables, Y3 stands for employment, and X10, X11, and X12 stand for the share of immigrants from EECs and from MPCs, and the share of native population in total population, respectively. We also re-estimate the model by substituting X13, the total population including migrants, for X12, and present the results in the lower section of the table. As is given by Table 2, immigrants from MPCs have a positive impact on employment in both light and heavy manufacturing industries. That said, immigrants from EECs have a positive impact on employment in food products, beverages and tobacco industries. Similarly, an increase in total population (including migrants) increases employment in wholesale and retail trade, hotels and restaurants, and decreases employment in light and heavy manufacturing industries, and in food products, beverages and tobacco industries.

Finally, we scrutinize how the rates of change in immigration affect industry-level employment, results of which are given by Table 3, where the signs, (+) and (−), refer to as positive significant and negative significant, respectively. The variable Y2, now, stands for the rate of change in employment, that is, employment \((t - (t - 1))/\text{employment (t - 1)}\). Similarly, the variables X6, X7, and X8 stand for the change in the share of immigrants from EECs and from MPCs, and the change in the share of native population in total population, respectively. We re-estimate the model by substituting X9, the change in the total population including migrants, for X8, and present the results in the lower section of the table. As is consistent with our previous results, in this case, our results suggest a negative relationship between the change in total population and the change in employment, especially in food products, beverages, and tobacco, and light manufacturing industries. Also we observe the same effects in the same industries even when we do not substitute the change in the total population for the change in the share of native population in total population. In this case, we observe a positive impact of immigrants from MPCs on employment, especially in the construction industry.
5 Concluding Remarks

In this study, we have scrutinized the effects of ethnic diversity, measured by the share of immigrants in total population in the EU member countries, on the number of establishments and employment in the EU. We have distinguished between different industries and between different groups of source (migrant-sending) countries; i.e., Eastern European Countries (EECs) and Mediterranean Countries (MPCs).

One solid conclusion that can be drawn from our estimation results is that immigration from MPCs certainly has a capacity building effect, especially on manufacturing industries. Empirical evidence is more solid in light manufacturing as immigrants from MPCs have a positive impact both on the number of enterprises, and on employment, whereas for heavy manufacturing, the only positive effect is on employment. In contrast, immigration from EECs has a negative impact on the number of enterprises in electricity, gas and water supply industries, but a positive impact on employment, especially in food products, beverages and tobacco industries. We suppose this distinction between the results regarding employment effects is due to the historical colonial relationship between MPCs and the EU countries. Taking this relationship for granted, and given the large share of immigrants from MPCs in the EU for long time, immigrants from MPCs probably satisfy their needs of ethnic food and beverages more easily, and so do not feel the necessity to expand production capacity of ethnic food and beverages. Another possibility is that there are already sufficient imports of ethnic food and beverages, especially from MPCs to the EU. Therefore less qualified immigrants from MPCs prefer to work in less demanding but better paying positions as in the light and heavy manufacturing industries. As for the less qualified immigrants from EECs, food and beverages might be the only industry that they may get employed, especially in the short run.

Another interesting result is that there is a negative relationship between the change in the share of native population in total population and the change in employment, especially in food, beverages, and tobacco, and light manufacturing industries. Actually, this finding is consistent with the ones that we have already discussed, such that natives probably prefer to have a better work environment and to take up better paying jobs, and so they rather leave low-profile jobs to immigrants, which is also supported by the employment argument above.

Finally, our results have shown that an increase in the change in the share of immigrants
from MPCs increases employment in the construction industry, which might be expected, especially due to low skill levels of immigrants, or due to some other factors that we have already discussed in the introduction section (e.g. the non-recognition of immigrants’ qualifications and skills which are earned abroad).

We believe further studies, especially looking at industry-wise trade and migration, are warranted in order to draw a complete picture. It would be interesting to find complementary results, especially between the change in trade patterns and the change in industrial enterprises. Also we leave computing the factor content of industries in order to see the similarities and differences, and factors affecting international migration as future research.

References


Not for publication
APPENDIX: RESULTS

Changes in the number of enterprises

Y1 = # of enterprises (t - (t-1))/ enterprises (t - 1)
X1 = immigration from EECs (t - (t-1))/ total population (t - 1)
X2 = immigration from MPCs (t - (t-1))/ total population (t - 1)
X3 = native people (t- (t-1))/ total population (t - 1)
X4 = per labor renumeration

Table A1: Mining and quarrying (I)

|   | y1                       | Robust Coef. | Std. Err. | t     | P>|t|   | [95% Conf. Interval] |
|---|--------------------------|--------------|-----------|-------|------|----------------------|
|   |                          |              |           |       |      |                      |
| x1| -5.826768                | 4.314554     | -1.34     | 0.204 | -15.2862 | 3.632664 |
|x2 | 1.659532                 | 25.55738     | 0.06      | 0.949 | 84.02521 | 57.34628 |
|x3 | -12.02624                | 6.062879     | 1.08      | 0.019 | -24.42422 | 3.907742 |
|x4 | 0.0579442                | 0.026460     | 2.10      | 0.058 | 0.002529 | 0.133514 |

Wooldridge test for autocorrelation in panel data
H0: no first-order autocorrelation
F(4,12) = 2.01
Prob > F = 0.1564

Table A2: Mining and quarrying (II) - population to replace X3

|   | y1                       | Robust Coef. | Std. Err. | t     | P>|t|   | [95% Conf. Interval] |
|---|--------------------------|--------------|-----------|-------|------|----------------------|
|   |                          |              |           |       |      |                      |
| x1| 4.373359                 | 6.297064     | 0.70      | 0.499 | -9.30894 | 18.05566 |
|x2 | 11.90253                 | 21.08721     | 0.55      | 0.593 | -35.54884 | 59.1549 |
|x3 | -18.25621                | 6.122934     | 1.16      | 0.120 | -23.59877 | 3.086335 |
|dlnpop | -160.3632               | 697.7792     | -0.24     | 0.813 | -168.674 | 1351.947 |
|cons | 0.0589071                | 0.0274891    | 2.09      | 0.059 | 0.0025838 | 0.118598 |

Wooldridge test for autocorrelation in panel data
H0: no first-order autocorrelation
F(1,12) = 6.813
Prob > F = 0.0220
Table A3: Food products, beverages and tobacco (I)

. xtgll y1 x1 x2 x3 x4, fe cluster(n)
Fixed-effects (within) regression                              Number of obs = 117
Group variable: m                                           Number of groups = 13
R-sq: within = 0.1123                                        Obs per group: min = 9
between = 0.0867                                            avg = 9.0
overall = 0.0088                                            max = 9

F(4,12) = 1.02                                             Prob > F = 0.4344

(Std. Err. adjusted for 13 clusters in n)

<table>
<thead>
<tr>
<th>y1</th>
<th>Robust</th>
<th>Std. Err.</th>
<th>t</th>
<th>[95% Conf. Interval]</th>
</tr>
</thead>
<tbody>
<tr>
<td>x1</td>
<td>2.83452</td>
<td>4.030298</td>
<td>0.85</td>
<td>-0.0465</td>
</tr>
<tr>
<td>x2</td>
<td>-0.0525</td>
<td>0.020311</td>
<td>-2.59</td>
<td>-0.1036</td>
</tr>
<tr>
<td>x3</td>
<td>-0.0324</td>
<td>0.020311</td>
<td>-1.69</td>
<td>-0.0105</td>
</tr>
<tr>
<td>x4</td>
<td>-0.0324</td>
<td>0.020311</td>
<td>-1.69</td>
<td>-0.0105</td>
</tr>
<tr>
<td>_cons</td>
<td>0.334402</td>
<td>0.023665</td>
<td>1.55</td>
<td>0.146</td>
</tr>
</tbody>
</table>

Modified Wald test for groupwise heteroskedasticity
in fixed effect regression model

H0: sigma(i)^2 = sigma^2 for all i
chi2 (13) = 455.39
Prob>chi2 = 0.0000

Wooldridge test for autocorrelation in panel data
H0: no first-order autocorrelation
F(1,12) = 0.7057
Prob > F = 0.4110

Table A4: Food products, beverages and tobacco (II)- population to replace X3

. xtgll y1 x1 x2 dlnpop x4, fe cluster(n)
Fixed-effects (within) regression                              Number of obs = 117
Group variable: m                                           Number of groups = 13
R-sq: within = 0.1123                                        Obs per group: min = 9
between = 0.0868                                            avg = 9.0
overall = 0.0088                                            max = 9

corr(u_i, Xb) = -0.6936                                        F(4,12) = 1.02
Prob > F = 0.4275

(Std. Err. adjusted for 13 clusters in n)

<table>
<thead>
<tr>
<th>y1</th>
<th>Robust</th>
<th>Std. Err.</th>
<th>t</th>
<th>[95% Conf. Interval]</th>
</tr>
</thead>
<tbody>
<tr>
<td>x1</td>
<td>3.893652</td>
<td>3.048261</td>
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<td>0.226</td>
</tr>
<tr>
<td>x2</td>
<td>1.966527</td>
<td>6.414461</td>
<td>0.37</td>
<td>0.976</td>
</tr>
<tr>
<td>dlnpop</td>
<td>-7.966024</td>
<td>5.000486</td>
<td>-1.59</td>
<td>0.137</td>
</tr>
<tr>
<td>x4</td>
<td>-25.994064</td>
<td>70.08293</td>
<td>-0.37</td>
<td>0.720</td>
</tr>
<tr>
<td>_cons</td>
<td>0.390504</td>
<td>0.023765</td>
<td>1.55</td>
<td>0.146</td>
</tr>
</tbody>
</table>

Modified Wald test for groupwise heteroskedasticity
in fixed effect regression model

H0: sigma(i)^2 = sigma^2 for all i
chi2 (13) = 455.61
Prob>chi2 = 0.0000

Wooldridge test for autocorrelation in panel data
H0: no first-order autocorrelation
F(1,12) = 0.7057
Prob > F = 0.4110
Table A5: Light Manufacturing (I)

```
.xtreg y1 x1 x2 x3 x4, fe robust
Fixed-effects (within) regression
Number of obs = 117
Group variable: m
Number of groups = 13
R-sq: within = 0.0825
between = 0.3548
overall = 0.0801
F(4, 12) = 2.13
Prob > F = 0.1403
(Std. Err. adjusted for 13 clusters in m)

<table>
<thead>
<tr>
<th></th>
<th>Robust</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>y1</td>
<td>Coef.</td>
<td>Std. Err.</td>
<td>t</td>
<td>95% Conf. Interval</td>
</tr>
<tr>
<td>----</td>
<td>--------------</td>
<td>-----</td>
<td>------------</td>
<td>-----</td>
<td>------------------</td>
</tr>
<tr>
<td>x1</td>
<td>-0.573976</td>
<td>0.0823</td>
<td>-1.08</td>
<td>0.301</td>
<td>-1.938990 to 1.781938</td>
</tr>
<tr>
<td>x2</td>
<td>0.303589</td>
<td>0.053808</td>
<td>0.16</td>
<td>0.873</td>
<td>-0.758556 to 1.365733</td>
</tr>
<tr>
<td>x3</td>
<td>-8.273735</td>
<td>5.082511</td>
<td>-1.63</td>
<td>0.179</td>
<td>-20.91632 to 4.368849</td>
</tr>
<tr>
<td>x4</td>
<td>6.311121</td>
<td>6.079219</td>
<td>-1.02</td>
<td>0.329</td>
<td>-11.937190 to 24.56047</td>
</tr>
<tr>
<td>cons</td>
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<td>1.54</td>
<td>0.150</td>
<td>-0.0176578 to 0.867376</td>
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<td>sigma_u</td>
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<td></td>
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<td></td>
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</tr>
<tr>
<td>sigma_e</td>
<td>0.6888702</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>rho</td>
<td>0.3987358</td>
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<td></td>
</tr>
</tbody>
</table>

Modified Wald test for groupwise heteroskedasticity
in fixed effect regression model
H0: sigma(i)^2 = sigma^2 for all i
chi2 (13) = 2492.10
Prob=chi2 = 0.0000

.xserial y1 x1 x2 x3 x4
Wooldridge test for autocorrelation in panel data
H0: no first-order autocorrelation
F(1, 12) = 0.862
Prob > F = 0.3715
```

Table A6: Light Manufacturing (II) - population to replace X3

```
.xtreg y1 x1 x2 dlnpop x4, fe robust
Fixed-effects (within) regression
Number of obs = 117
Group variable: m
Number of groups = 13
R-sq: within = 0.0825
between = 0.3548
overall = 0.0801
F(4, 12) = 2.13
Prob > F = 0.1403
(Std. Err. adjusted for 13 clusters in m)

<table>
<thead>
<tr>
<th></th>
<th>Robust</th>
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<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
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<td></td>
<td>y1</td>
<td>Coef.</td>
<td>Std. Err.</td>
<td>t</td>
<td>95% Conf. Interval</td>
</tr>
<tr>
<td>----</td>
<td>--------------</td>
<td>-----</td>
<td>------------</td>
<td>-----</td>
<td>------------------</td>
</tr>
<tr>
<td>x1</td>
<td>1.646955</td>
<td>2.021764</td>
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<td>0.580</td>
<td>-4.457145 to 7.733994</td>
</tr>
<tr>
<td>x2</td>
<td>11.34797</td>
<td>17.375641</td>
<td>0.65</td>
<td>0.526</td>
<td>-26.46183 to 49.15517</td>
</tr>
<tr>
<td>x3</td>
<td>-8.30254</td>
<td>5.846965</td>
<td>1.24</td>
<td>0.181</td>
<td>-21.04199 to 4.436894</td>
</tr>
<tr>
<td>x4</td>
<td>-6.18658</td>
<td>6.084441</td>
<td>-1.02</td>
<td>0.329</td>
<td>-19.94346 to 7.57279</td>
</tr>
<tr>
<td>cons</td>
<td>0.425318</td>
<td>0.0277374</td>
<td>1.53</td>
<td>0.151</td>
<td>-0.0178027 to 0.862664</td>
</tr>
<tr>
<td>sigma_u</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>sigma_e</td>
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<td></td>
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</tr>
<tr>
<td>rho</td>
<td>0.2986339</td>
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<td></td>
</tr>
</tbody>
</table>

Modified Wald test for groupwise heteroskedasticity
in fixed effect regression model
H0: sigma(i)^2 = sigma^2 for all i
chi2 (13) = 2492.82
Prob=chi2 = 0.0000

Wooldridge test for autocorrelation in panel data
H0: no first-order autocorrelation
F(1, 12) = 0.863
Prob > F = 0.3712
```
Table A7: Heavy Manufacturing (I)

. xtrg y1 x1 x2 x3 x4, fe robust
Fixed-effects (within) regression
Number of obs = 117
Group variable: m
Number of groups = 13
R-sq: within = 0.0661
between = 0.3753
overall = 0.0600
Obs per group: min = 9
avg = 9.0
max = 9
corr(u_i, Xb) = -0.7605
F(4, 12) = 1.14
Prob > F = 0.3823
(Std. Err. adjusted for 13 clusters in n)

<table>
<thead>
<tr>
<th>y1</th>
<th>Robust</th>
<th>Coef.</th>
<th>Std. Err.</th>
<th>t</th>
<th>Prob &gt;</th>
<th>[95% Conf. Interval]</th>
</tr>
</thead>
<tbody>
<tr>
<td>x1</td>
<td></td>
<td>-8.223834</td>
<td>9.063605</td>
<td>-0.89</td>
<td>0.382</td>
<td>-27.97173 to 11.52406</td>
</tr>
<tr>
<td>x2</td>
<td></td>
<td>-6.546933</td>
<td>16.92177</td>
<td>-0.41</td>
<td>0.692</td>
<td>-41.73945 to 28.64566</td>
</tr>
<tr>
<td>x3</td>
<td></td>
<td>-18.94569</td>
<td>8.343544</td>
<td>-1.31</td>
<td>0.214</td>
<td>-29.10468 to 7.23213</td>
</tr>
<tr>
<td>x4</td>
<td></td>
<td>0.035625</td>
<td>17.56219</td>
<td>0.01</td>
<td>0.938</td>
<td>-29.22911 to 47.30836</td>
</tr>
<tr>
<td>const</td>
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<td>0.062485</td>
<td>0.089713</td>
<td>1.60</td>
<td>0.135</td>
<td>-0.822455 to 1.473969</td>
</tr>
</tbody>
</table>

sigma_u .05321628
sigma_e .08888717
rho .26422853 (fraction of variance due to u_i)

Modified Wald test for groupwise heteroskedasticity
in fixed effect regression model
H0: sigma(i)^2 = sigma^2 for all i
chi2 (13) = 4612.87
Prob>chi2 = 0.0000

Wooldridge test for autocorrelation in panel data
F(1, 12) = 2.121
Prob > F = 0.1710

Table A8: Heavy Manufacturing (II) - population to replace X3

. xtrg y1 x1 x2 dlnpop x4, fe robust
Fixed-effects (within) regression
Number of obs = 117
Group variable: m
Number of groups = 13
R-sq: within = 0.0661
between = 0.3753
overall = 0.0600
Obs per group: min = 9
avg = 9.0
max = 9
corr(u_i, Xb) = -0.7597
F(4, 12) = 1.14
Prob > F = 0.3847
(Std. Err. adjusted for 13 clusters in n)

<table>
<thead>
<tr>
<th>y1</th>
<th>Robust</th>
<th>Coef.</th>
<th>Std. Err.</th>
<th>t</th>
<th>Prob &gt;</th>
<th>[95% Conf. Interval]</th>
</tr>
</thead>
<tbody>
<tr>
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<td></td>
<td>2.709526</td>
<td>2.313085</td>
<td>1.17</td>
<td>0.264</td>
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</tr>
<tr>
<td>x2</td>
<td></td>
<td>4.426297</td>
<td>13.77991</td>
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<td>0.754</td>
<td>-25.59537 to 34.44796</td>
</tr>
<tr>
<td>dlnpop</td>
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<td>-18.98072</td>
<td>8.396392</td>
<td>-1.31</td>
<td>0.215</td>
<td>-29.27469 to 7.33251</td>
</tr>
<tr>
<td>x4</td>
<td></td>
<td>9.015426</td>
<td>17.58479</td>
<td>0.51</td>
<td>0.617</td>
<td>-29.20454 to 47.33359</td>
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<td>0.0624868</td>
<td>0.091375</td>
<td>1.60</td>
<td>0.136</td>
<td>-0.8227669 to 1.476926</td>
</tr>
</tbody>
</table>

sigma_u .05306615
sigma_e .08882349
rho .26299686 (fraction of variance due to u_i)

Modified Wald test for groupwise heteroskedasticity
in fixed effect regression model
H0: sigma(i)^2 = sigma^2 for all i
chi2 (13) = 4624.00
Prob>chi2 = 0.0000

Wooldridge test for autocorrelation in panel data
H0: no first-order autocorrelation
F(1, 12) = 2.122
Prob > F = 0.1708
Table A9: Electricity, gas and water supply (I)

```
.xtreg y1 x1 x2 x3 x4, fe robust
Fixed-effects (within) regression
                  Number of obs =  117
Group variable: n  Number of groups =  13
R-sq: within = 0.0218  Obs per group: min =  9
                   between = 0.7382  avg =  9.0
                   overall = 0.0850  max =  9
 corre(u_i, Xb) = -0.3756
F(4,12) = 1.66  Prob > F = 0.2227

(Std. Err. adjusted for 13 clusters in n)
                    Robust
                       y1  Coef.  Std. Err.  t  P>|t|  [95% Conf. Interval]
                  x1      9.873084  9.612618  1.03  0.325  -11.07101  30.81718
                  x2      -71.99448  63.97554 -1.13  0.282  -221.3921  77.40536
                  x3      -2.101343  6.856799 -0.31  0.765  -17.04883  12.83814
                  x4      155.3505  74.42552  2.08  0.099  -7.281657 337.9824
               _cons    0.0332857    0.033065  2.52  0.027  0.0112432 0.0553282

sigma_u = 0.09318541
sigma_e = 0.14557684
rho = 0.29865074 (fraction of variance due to u_i)
```

Modified Wald test for groupwise heteroskedasticity in fixed effect regression model

H0: sigma(i)^2 = sigma^2 for all i  
chi2 (13) = 20460.87  Prob>chi2 = 0.0000

Wooldridge test for autocorrelation in panel data

H0: no first-order autocorrelation
F(4,12) = 4.379  Prob > F = 0.0583

Table A10: Electricity, gas and water supply (II) - population to replace X3

```
.xtreg y1 x1 x2 dipnpop x4, fe robust
Fixed-effects (within) regression
                  Number of obs =  117
Group variable: n  Number of groups =  13
R-sq: within = 0.0218  Obs per group: min =  9
                   between = 0.7382  avg =  9.0
                   overall = 0.0850  max =  9
 corre(u_i, Xb) = -0.3725
F(4,12) = 1.66  Prob > F = 0.2231

(Std. Err. adjusted for 13 clusters in n)
                    Robust
                       y1  Coef.  Std. Err.  t  P>|t|  [95% Conf. Interval]
                  x1      11.96626  11.39977  1.05  0.314  -12.86971  36.80623
                  x2      -69.95606  58.64509 -1.19  0.256  -197.6883 57.77302
dipnpop  -2.805566  6.092025 -0.46  0.649  -12.03717  7.42604
                  x4      155.2991  74.76487  2.08  0.060  -7.696843 318.1997
               _cons    0.0331761    0.0331592  2.51  0.027  0.0109246 0.0554309

sigma_u = 0.09308945
sigma_e = 0.14557679
rho = 0.29862035 (fraction of variance due to u_i)
```

Modified Wald test for groupwise heteroskedasticity in fixed effect regression model

H0: sigma(i)^2 = sigma^2 for all i  
chi2 (13) = 20495.99  Prob>chi2 = 0.0000

Wooldridge test for autocorrelation in panel data

H0: no first-order autocorrelation
F(4,12) = 4.379  Prob > F = 0.0583
### Table A11: Construction (I)

```
.xtreg y1 x1 x2 x3 x4, fe robust
Fixed-effects (within) regression
Number of obs = 117
Group variable: m
Number of groups = 13
R-sq: within = 0.0270
between = 0.1335
overall = 0.0028
Obs per group: min = 9
avg = 9.0
max = 9
F(4,12) = 2.11
Prob > F = 0.1430
(Std. Err. adjusted for 13 clusters in m)

|    y | Robust    | Coef. | Std. Err. |    t |  P>|t|  | [95% Conf. Interval] |
|------|-----------|-------|-----------|------|-----|----------------------|
| x1   | -125.3513 | 88.42307 | -1.42 | 0.182 | -318.0086 | 67.30605 |
| x2   | 111.4648  | 82.70599  | 1.35  | 0.263 | -68.7141 | 291.6637 |
| x3   | -9.49347  | 20.37609  | -0.47 | 0.649 | -53.8825 | 34.88556 |
| x4   | 505.4124  | 526.5841  | 0.95  | 0.360 | -650.631 | 1661.456 |
| cons | 116.6163  | 0.0681508 | 1.71  | 0.113 | -0.318715 | 2.651842 |

sigma_u | .31575407 |
sigma_e | .87968284 |
rho    | .11412096 |

Modiffed Wald test for groupwise heteroskedasticity in fixed effect regression model
H0: sigma(i)^2 = sigma^2 for all i
ch2 [13] = 5.00e+06
Prob=ch2 = 0.0000

Wooldridge test for autocorrelation in panel data
H0: no first-order autocorrelation
F(1, 12) = 0.645
Prob > F = 0.4374
```

### Table A12: Construction (II) - population to replace X3

```
.xtreg y1 x1 x2 dmpop x4, fe robust
Fixed-effects (within) regression
Number of obs = 117
Group variable: m
Number of groups = 13
R-sq: within = 0.0270
between = 0.1335
overall = 0.0028
Obs per group: min = 9
avg = 9.0
max = 9
F(4,12) = 2.11
Prob > F = 0.1430
(Std. Err. adjusted for 13 clusters in m)

|    y | Robust    | Coef. | Std. Err. |    t |  P>|t|  | [95% Conf. Interval] |
|------|-----------|-------|-----------|------|-----|----------------------|
| x1   | -115.8434 | 69.95987 | -1.66 | 0.124 | -268.7278 | 36.58608 |
| x2   | 121.0492  | 97.8371  | 1.24  | 0.240 | -92.1322 | 334.2325 |
| dmpop| -9.631268 | 20.55267  | -0.47 | 0.644 | -54.41166 | 35.14915 |
| x4   | 505.5811  | 536.6386  | 0.95  | 0.360 | -650.5812 | 1661.743 |
| cons | .117960   | .0686185  | 1.71  | 0.114 | -0.332447 | 2.665869 |

sigma_u | .3157346 |
sigma_e | .87959854 |
rho    | .11414937 |

Modified Wald test for groupwise heteroskedasticity in fixed effect regression model
H0: sigma(i)^2 = sigma^2 for all i
ch2 [13] = 5.00e+06
Prob=ch2 = 0.0000

Wooldridge test for autocorrelation in panel data
H0: no first-order autocorrelation
F(1, 12) = 0.644
Prob > F = 0.4377
Table A13: W/sale, Retail Trade; Hotels and Rest. (I)

```
. xtregr y1 x1 x2 x3 x4, fe robust
Fixed-effects (within) regression
Number of obs = 117
Group variable: i
Number of groups = 13
R-sq: within = 0.0772
between = 0.0455
overall = 0.0135
Obs per group: min = 9
avg = 9.0
max = 9
corr(u_i, Xb) = -0.6662
(Std. Err. adjusted for 13 clusters in i)

| y1   | Robust | Coef. | Std. Err. | t     | P>|t| | [95% Conf. Interval] |
|------|--------|-------|-----------|-------|-----|----------------------|
| x1   | -0.26354 | 55.95094 | -1.42 | 0.182 | -281.17 | 42.63933 |
| x2   | 0.38553 | 135.3499 | 0.48 | 0.643 | -230.1697 | 358.7718 |
| x3   | 0.7374 | 40.84077 | -1.55 | 0.147 | -185.7877 | 31.41971 |
| x4   | 0.00758 | 163.7172 | 0.09 | 0.384 | -286.6334 | 504.785 |
| cons | 0.43767 | 2184764 | 2.00 | 0.068 | -.0386522 | 0.9133862 |

sigma_u | 0.3327484
sigma_e | 0.5921487
rho     | -0.3662
```

Modified Wald test for groupwise heteroskedasticity in fixed effect regression model
H0: sigma(i)^2 = sigma^2 for all i
chi2 (13) = 83693.93
Prob>chi2 = 0.0000

Wooldridge test for autocorrelation in panel data
H0: no first-order autocorrelation
F(1, 12) = 2.985
Prob > F = 0.1097

Table A14: W/sale, Retail Trade; Hotels and Rest. (II) - population to replace X3

```
. xtregr y1 x1 x2 dlnpop x4, fe robust
Fixed-effects (within) regression
Number of obs = 117
Group variable: i
Number of groups = 13
R-sq: within = 0.0772
between = 0.0455
overall = 0.0135
Obs per group: min = 9
avg = 9.0
max = 9
corr(u_i, Xb) = -0.6662
(Std. Err. adjusted for 13 clusters in i)

| y1    | Robust | Coef. | Std. Err. | t     | P>|t| | [95% Conf. Interval] |
|-------|--------|-------|-----------|-------|-----|----------------------|
| x1    | -2.176243 | 17.2026 | -0.13 | 0.912 | -39.8523 | 35.49982 |
| x2    | 0.144376 | 126.3027 | 1.16 | 0.263 | -129.8775 | 466.2227 |
| dlnpop| -1.44764 | 50.4366 | -1.54 | 0.149 | -186.5152 | 32.6366 |
| x4    | 0.48615 | 161.9207 | 0.99 | 0.384 | -206.961 | 595.344 |
| cons  | 0.4372917 | 2194712 | 1.99 | 0.070 | -.040895 | 0.9154783 |

sigma_u | 0.33164945
sigma_e | 0.5214724
rho     | -0.3662
```

Modified Wald test for groupwise heteroskedasticity in fixed effect regression model
H0: sigma(i)^2 = sigma^2 for all i
chi2 (13) = 83905.07
Prob>chi2 = 0.0000

Wooldridge test for autocorrelation in panel data
H0: no first-order autocorrelation
F(1, 12) = 2.987
Prob > F = 0.1096
The number of enterprises

\( Y = \# \) of enterprises

\( Y_2 = \) the share of immigrants from EECs in the total population

\( Y_3 = \) the share of immigrants from MPCs in the total population

\( Y_4 = \) the share of natives in the total population

\( Y_5 = \) remuneration paid to employees

Table A15: Mining and quarrying (I)

```
.xtreg y y2 y3 y4 y5, fe robust
Fixed-effects (within) regression
Number of obs = 130
Group variable: m
Number of groups = 13
R-sq: within = 0.0579
Obs per group: min = 10
between = 0.1932
max = 10
overall = 0.1829

corr(u_i, Xb) = -0.5479
F(3,12) = 1.30
Prob > F = 0.3481
```

(Std. Err. adjusted for 13 clusters in n)

<table>
<thead>
<tr>
<th>y</th>
<th>Robust</th>
<th>Coef.</th>
<th>Std. Err.</th>
<th>t</th>
<th>[95% Conf. Interval]</th>
</tr>
</thead>
<tbody>
<tr>
<td>y2</td>
<td>(dropped)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>y3</td>
<td>57.05161</td>
<td>54.80186</td>
<td>1.04</td>
<td>0.318</td>
<td>-62.35139 - 176.4546</td>
</tr>
<tr>
<td>y4</td>
<td>-0.029511</td>
<td>6.276368</td>
<td>0.00</td>
<td>0.997</td>
<td>-13.65208 - 13.69798</td>
</tr>
<tr>
<td>y5</td>
<td>-1.441431</td>
<td>0.95623</td>
<td>-1.48</td>
<td>0.166</td>
<td>-2.84924 - 0.67227</td>
</tr>
<tr>
<td>cons</td>
<td>7.644057</td>
<td>6.081973</td>
<td>1.26</td>
<td>0.233</td>
<td>-5.667446 - 28.92052</td>
</tr>
</tbody>
</table>

Sigma_u 1.1216383
Sigma_e 0.10928668
rho 0.9950973 (fraction of variance due to u_i)

Modified Wald test for groupwise heteroskedasticity
in fixed effect regression model

\( H_0: \) sig(i)=2

\( \text{chi2 (12)} = 26579.48 \)

Prob>chi2 = 0.0000

Wooldridge test for autocorrelation in panel data

\( H_0: \) no first-order autocorrelation

\( F(1, 12) = 0.390 \)

Prob > F = 0.5442

Table A16: Mining and quarrying (II) - population to replace \( Y_4 \)

```
.xtreg y y2 y3 lnpop y5, fe robust
Fixed-effects (within) regression
Number of obs = 130
Group variable: m
Number of groups = 13
R-sq: within = 0.0080
Obs per group: min = 10
between = 0.5362
max = 10
overall = 0.5311

corr(u_i, Xb) = -0.4292
F(4,12) = 2.41
Prob > F = 0.1973
```

(Std. Err. adjusted for 13 clusters in n)

<table>
<thead>
<tr>
<th>y</th>
<th>Robust</th>
<th>Coef.</th>
<th>Std. Err.</th>
<th>t</th>
<th>[95% Conf. Interval]</th>
</tr>
</thead>
<tbody>
<tr>
<td>y2</td>
<td>-3.638216</td>
<td>5.834633</td>
<td>-0.62</td>
<td>0.545</td>
<td>-16.35079 - 9.074656</td>
</tr>
<tr>
<td>y3</td>
<td>34.97832</td>
<td>42.00829</td>
<td>0.83</td>
<td>0.421</td>
<td>-56.54987 - 126.5965</td>
</tr>
<tr>
<td>lnpop</td>
<td>1.228025</td>
<td>0.293068</td>
<td>1.48</td>
<td>0.164</td>
<td>-0.7590752 - 3.035126</td>
</tr>
<tr>
<td>y5</td>
<td>0.288224</td>
<td>0.960342</td>
<td>-2.32</td>
<td>0.038</td>
<td>-1.807454 - -0.325715</td>
</tr>
<tr>
<td>cons</td>
<td>-12.46672</td>
<td>13.87289</td>
<td>-0.90</td>
<td>0.386</td>
<td>-42.69514 - 17.75771</td>
</tr>
</tbody>
</table>

Sigma_u 0.78336
Sigma_e 0.108479
rho 0.98118435 (fraction of variance due to u_i)

Modified Wald test for groupwise heteroskedasticity
in fixed effect regression model

\( H_0: \) sig(i)=2

\( \text{chi2 (12)} = 1.20e+05 \)

Prob>chi2 = 0.0000

Wooldridge test for autocorrelation in panel data

\( H_0: \) no first-order autocorrelation

\( F(1, 12) = 0.386 \)

Prob > F = 0.5462
Table A17: Food products, beverages and tobacco (I)

```
. xreg y y2 y3 y4 y5, fe cluster(n)
Fixed-effects (within) regression
  Number of obs = 130
  Number of groups = 13
R-sq: within = 0.0057  Obs per group: min = 10
  between = 0.0200  avg = 10.0
  overall = 0.0197  max = 10

corr(u_i, Xb) = -0.1155  F(3,12) = 0.13  Prob > F = 0.9433
  (Std. Err. adjusted for 13 clusters in n)

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<td>Coef.</td>
<td>Std. Err.</td>
<td>t</td>
<td>5% 95% Conf. Interval</td>
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<td>-----</td>
<td>---------</td>
<td>------------</td>
<td>-----</td>
<td>----------------------</td>
</tr>
<tr>
<td>y</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>y2</td>
<td>(dropped)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>y3</td>
<td>14.94584</td>
<td>30.24585</td>
<td>0.49</td>
<td>-50.92149 to 80.86858</td>
</tr>
<tr>
<td>y4</td>
<td>7.773957</td>
<td>7.72036</td>
<td>0.23</td>
<td>-15.15955 to 10.70777</td>
</tr>
<tr>
<td>y5</td>
<td>0.283705</td>
<td>0.1679819</td>
<td>0.17</td>
<td>-0.869 to -0.3376306</td>
</tr>
<tr>
<td></td>
<td>0.366836</td>
<td>0.3703446</td>
<td>0.83</td>
<td>-11.29336 to 25.21503</td>
</tr>
<tr>
<td>sigm u</td>
<td>1.263439</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>sigm e</td>
<td>0.6628051</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>rho</td>
<td>0.9975305</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
```

Modified Wald test for groupwise heteroskedasticity in fixed effect regression model

H0: $\sigma(i)^2 = \sigma(i)^2$ for all i

chi²(13) = 3518.76  Prob = 0.0000

Wooldridge test for autocorrelation in panel data

H0: no first-order autocorrelation

F(3,12) = 116.156  Prob > F = 0.0000

Table A18: Food products, beverages and tobacco (II) - population to replace Y4

```
. xreg y y2 y3 inpop y5, fe cluster(n)
Fixed-effects (within) regression
  Number of obs = 130
  Number of groups = 13
R-sq: within = 0.0332  Obs per group: min = 10
  between = 0.02961  avg = 10.0
  overall = 0.02952  max = 10

corr(u_i, Xb) = -0.9233  F(4,12) = 3.37  Prob > F = 0.0457
  (Std. Err. adjusted for 13 clusters in n)

<table>
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<th></th>
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</thead>
<tbody>
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<td></td>
<td>Coef.</td>
<td>Std. Err.</td>
<td>t</td>
<td>5% 95% Conf. Interval</td>
</tr>
<tr>
<td>-----</td>
<td>---------</td>
<td>------------</td>
<td>-----</td>
<td>----------------------</td>
</tr>
<tr>
<td>y</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>y2</td>
<td>0.952456</td>
<td>5.921495</td>
<td>0.16</td>
<td>-11.94481 to 13.85425</td>
</tr>
<tr>
<td>y3</td>
<td>36.12223</td>
<td>24.29297</td>
<td>1.49</td>
<td>-18.80975 to 89.05215</td>
</tr>
<tr>
<td>inpop</td>
<td>-1.924379</td>
<td>0.654344</td>
<td>-2.94</td>
<td>-4.682390 to 1.913579</td>
</tr>
<tr>
<td>y5</td>
<td>0.259726</td>
<td>0.174804</td>
<td>1.45</td>
<td>-0.173 to -0.3131773</td>
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<tr>
<td></td>
<td>0.353689</td>
<td>10.77539</td>
<td>0.36</td>
<td>-15.40663 to 62.46516</td>
</tr>
<tr>
<td>sigm u</td>
<td>2.770297</td>
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<td></td>
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</tr>
<tr>
<td>sigm e</td>
<td>0.05892272</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>rho</td>
<td>0.99954781</td>
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<td></td>
</tr>
</tbody>
</table>
```

Modified Wald test for groupwise heteroskedasticity in fixed effect regression model

H0: $\sigma(i)^2 = \sigma(i)^2$ for all i

chi²(13) = 1177.96  Prob = 0.0000

Wooldridge test for autocorrelation in panel data

H0: no first-order autocorrelation

F(3,12) = 74.833  Prob > F = 0.0000
Table A19: Light Manufacturing (I)

```
xreg y y2 y3 y4 y5, fe cluster(n)
```

<table>
<thead>
<tr>
<th>y</th>
<th>Robust</th>
<th>Coef.</th>
<th>Std. Err.</th>
<th>t</th>
<th>[95% Conf. Interval]</th>
</tr>
</thead>
<tbody>
<tr>
<td>y2</td>
<td>(dropped)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>y3</td>
<td>47.7237</td>
<td>25.44937</td>
<td>0.66</td>
<td>0.021</td>
<td>12.28439</td>
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<tr>
<td>y4</td>
<td>8.07465</td>
<td>7.744295</td>
<td>1.04</td>
<td>0.038</td>
<td>-8.756885</td>
</tr>
<tr>
<td>y5</td>
<td>0.057648</td>
<td>0.159632</td>
<td>0.82</td>
<td>0.062</td>
<td>-0.319854</td>
</tr>
<tr>
<td>_cons</td>
<td>2.07946</td>
<td>0.174465</td>
<td>0.25</td>
<td>0.084</td>
<td>-15.71317</td>
</tr>
</tbody>
</table>

Table A20: Light Manufacturing (II) - population to replace Y4

```
xreg y y2 y3 lnpop y5, fe cluster(n)
```

<table>
<thead>
<tr>
<th>y</th>
<th>Robust</th>
<th>Coef.</th>
<th>Std. Err.</th>
<th>t</th>
<th>[95% Conf. Interval]</th>
</tr>
</thead>
<tbody>
<tr>
<td>y2</td>
<td>9.00909</td>
<td>0.78185</td>
<td>-1.03</td>
<td>0.325</td>
<td>-28.1437</td>
</tr>
<tr>
<td>y3</td>
<td>56.87329</td>
<td>24.16504</td>
<td>2.35</td>
<td>0.036</td>
<td>4.221287</td>
</tr>
<tr>
<td>lnpop</td>
<td>0.236329</td>
<td>0.073443</td>
<td>0.26</td>
<td>0.799</td>
<td>-1.74057</td>
</tr>
<tr>
<td>y5</td>
<td>0.048018</td>
<td>0.1346873</td>
<td>0.36</td>
<td>0.728</td>
<td>-0.339445</td>
</tr>
<tr>
<td>_cons</td>
<td>6.299223</td>
<td>14.2953</td>
<td>0.44</td>
<td>0.667</td>
<td>-24.85495</td>
</tr>
</tbody>
</table>

Modified Wald test for groupwise heteroskedasticity in fixed effect regression model

H0: sigma(i)^2 = sigma^2 for all i
chi2 (13) = 1744.71
Prob=chi2 = 0.0000

Wooldridge test for autocorrelation in panel data
H0: no first-order autocorrelation
F(1, 12) = 16.058
Prob > F = 0.0014
### Table A21: Heavy Manufacturing (I)

```
.xtreg y2 y3 y4 y5, fe cluster(n)
```

<table>
<thead>
<tr>
<th></th>
<th>Robust</th>
<th></th>
<th>[95% Conf. Interval]</th>
</tr>
</thead>
<tbody>
<tr>
<td>y</td>
<td>Coef.</td>
<td>Std. Err.</td>
<td>t</td>
</tr>
<tr>
<td>y2</td>
<td>(dropped)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>y3</td>
<td>59.57072</td>
<td>37.16355</td>
<td>1.60</td>
</tr>
<tr>
<td>y4</td>
<td>6.699662</td>
<td>6.221693</td>
<td>1.08</td>
</tr>
<tr>
<td>y5</td>
<td>0.243292</td>
<td>0.1474162</td>
<td>1.59</td>
</tr>
<tr>
<td>cons</td>
<td>1.096298</td>
<td>6.65911</td>
<td>0.16</td>
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</table>

Modified Wald test for groupwise heteroskedasticity in fixed effect regression model

<p>| | | |</p>
<table>
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</thead>
<tbody>
<tr>
<td>sigma_u</td>
<td>0.8980719</td>
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</tr>
<tr>
<td>sigma_e</td>
<td>0.08422153</td>
<td>(fraction of variance due to u_i)</td>
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<tr>
<td>rho</td>
<td>0.99128151</td>
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</table>

Wooldridge test for autocorrelation in panel data

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
</table>
| H0: 
| chi2 (13)           | 5594.64 |     |
| Prob>chi2            | 0.0000 |     |

### Table A22: Heavy Manufacturing (II) - population to replace Y4

```
.xtreg y2 y3 lnpop y5, fe cluster(n)
```

<table>
<thead>
<tr>
<th></th>
<th>Robust</th>
<th></th>
<th>[95% Conf. Interval]</th>
</tr>
</thead>
<tbody>
<tr>
<td>y</td>
<td>Coef.</td>
<td>Std. Err.</td>
<td>t</td>
</tr>
<tr>
<td>y2</td>
<td>-0.474203</td>
<td>0.753762</td>
<td>-1.08</td>
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<tr>
<td>y3</td>
<td>42.31306</td>
<td>36.79089</td>
<td>1.15</td>
</tr>
<tr>
<td>lnpop</td>
<td>1.1563015</td>
<td>0.72038</td>
<td>1.07</td>
</tr>
<tr>
<td>y5</td>
<td>0.2206331</td>
<td>0.09264</td>
<td>1.50</td>
</tr>
<tr>
<td>cons</td>
<td>-10.4642</td>
<td>23.45318</td>
<td>-0.43</td>
</tr>
</tbody>
</table>

Modified Wald test for groupwise heteroskedasticity in fixed effect regression model

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<table>
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<tr>
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</thead>
<tbody>
<tr>
<td>sigma_u</td>
<td>0.596659</td>
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</tr>
<tr>
<td>sigma_e</td>
<td>0.80339402</td>
<td>(fraction of variance due to u_i)</td>
</tr>
<tr>
<td>rho</td>
<td>0.9731903</td>
<td></td>
</tr>
</tbody>
</table>

Wooldridge test for autocorrelation in panel data

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
</table>
| H0: 
| chi2 (13)           | 2493.92 |     |
| Prob>chi2            | 0.0000 |     |
Table A23: Electricity, gas and water supply (I)

\[ \text{. xtregr y2 y3 y4 y5, fe cluster(n)} \]

Fixed-effects (within) regression

<table>
<thead>
<tr>
<th>Number of obs</th>
<th>Number of groups</th>
</tr>
</thead>
<tbody>
<tr>
<td>130</td>
<td>13</td>
</tr>
</tbody>
</table>

R-sq: within = 0.2932

<table>
<thead>
<tr>
<th>Obs per group: min</th>
<th>max</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>10</td>
</tr>
</tbody>
</table>

Overall: 0.3921

<table>
<thead>
<tr>
<th>Avg</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.0</td>
<td>10.0</td>
</tr>
</tbody>
</table>

corr(u_i, Xb) = -0.3329

F(3,12) = 2.73

Prob > F = 0.0903

(Std. Err. adjusted for 13 clusters in n)

<table>
<thead>
<tr>
<th>y</th>
<th>Robust Coef.</th>
<th>Std. Err.</th>
<th>t</th>
<th>[95% Conf. Interval]</th>
</tr>
</thead>
<tbody>
<tr>
<td>y2</td>
<td>(dropped)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>y3</td>
<td>167.4189</td>
<td>134.884</td>
<td>1.24</td>
<td>0.238 -126.2938 461.2317</td>
</tr>
<tr>
<td>y4</td>
<td>-14.7833</td>
<td>36.0263</td>
<td>-0.43</td>
<td>0.174 -89.5739 60.0073</td>
</tr>
<tr>
<td>y5</td>
<td>0.5375</td>
<td>0.394173</td>
<td>2.65</td>
<td>0.061 1.1893 0.8905</td>
</tr>
<tr>
<td>cons</td>
<td>13.09371</td>
<td>35.02086</td>
<td>0.37</td>
<td>0.715 -63.2319 89.4194</td>
</tr>
</tbody>
</table>

MA: \( \sigma_{i(j)}^2 = \sigma^2 \) for all i

chi2 (13) = 1077.35

Prob > chi2 = 0.0000

Wooldridge test for first-order autocorrelation in panel data

F(1,12) = 18.549

Prob > F = 0.0010

Table A24: Electricity, gas and water supply (II) - population to replace Y4

\[ \text{. xtregr y2 y3 lnspc y5, fe cluster(n)} \]

Fixed-effects (within) regression

<table>
<thead>
<tr>
<th>Number of obs</th>
<th>Number of groups</th>
</tr>
</thead>
<tbody>
<tr>
<td>130</td>
<td>13</td>
</tr>
</tbody>
</table>

R-sq: within = 0.7159

<table>
<thead>
<tr>
<th>Obs per group: min</th>
<th>max</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>10</td>
</tr>
</tbody>
</table>

Overall: 0.1036

<table>
<thead>
<tr>
<th>Avg</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.0</td>
<td>10.0</td>
</tr>
</tbody>
</table>

corr(u_i, Xb) = -0.9958

F(4,12) = 324.03

Prob > F = 0.0000

(Std. Err. adjusted for 13 clusters in n)

<table>
<thead>
<tr>
<th>y</th>
<th>Robust Coef.</th>
<th>Std. Err.</th>
<th>t</th>
<th>[95% Conf. Interval]</th>
</tr>
</thead>
<tbody>
<tr>
<td>y2</td>
<td>-28.3287</td>
<td>10.49351</td>
<td>-2.67</td>
<td>0.020 -53.28167 -5.376074</td>
</tr>
<tr>
<td>y3</td>
<td>5.519625</td>
<td>104.4741</td>
<td>0.05</td>
<td>0.599 -222.1098 233.1491</td>
</tr>
<tr>
<td>lnspc</td>
<td>2.19346</td>
<td>1.298795</td>
<td>1.68</td>
<td>0.080 2.512685 17.95523</td>
</tr>
<tr>
<td>y5</td>
<td>0.208123</td>
<td>0.214103</td>
<td>0.97</td>
<td>0.350 -.02584655 0.474638</td>
</tr>
<tr>
<td>cons</td>
<td>-214.6661</td>
<td>36.42509</td>
<td>-5.88</td>
<td>0.000 -293.4296 -134.7626</td>
</tr>
</tbody>
</table>

MA: \( \sigma_{i(j)}^2 = \sigma^2 \) for all i

chi2 (13) = 47214.16

Prob > chi2 = 0.0000

Wooldridge test for first-order autocorrelation in panel data

F(1,12) = 16.988

Prob > F = 0.0903

(Std. Err. adjusted for 13 clusters in n)
Table A25: Construction (I)

```
. xtregr y2 y3 y4 y5, fe robust
Fixed-effects (within) regression                      Number of obs =  130
Group variable: m                                     Number of groups =  13
R-sq: within  = 0.5451                                 Obs per group: min =  10
                       between = 0.2965                           avg =  10.0
                       overall = 0.2057                         max =  10
corr(u_i, Xb) = -0.5383
F(3, 12) = 7.02                                         Prob > F   = 0.0056
(Std. Err. adjusted for 13 clusters in n)

<table>
<thead>
<tr>
<th>y</th>
<th>Robust</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Coef.</td>
<td>Std.</td>
<td>t</td>
<td>[95% Conf. Interval]</td>
</tr>
<tr>
<td>y2</td>
<td>(dropped)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| y3         | -0.19067 | 65.83421 | -0.07 | 0.487 | -19.6301 | 96.25975
| y4         | 4.360879 | 10.79566 | 0.40 | 0.693 | -19.1615 | 27.88326
| y5         | 0.973917 | 3217963 | 1.01 | 0.21 | 1.666277 | 1.460526
| cons       | -2.20785 | 9.087000 | -0.24 | 0.81 | -22.0674 | 17.59346
| sigm u     | 1.1208527 |     |     |     |
| sigm e     | 0.7746583 |     |     |     |
| rho        | 0.1842 |     |     |     |
```

Modified Wald test for groupwise heteroskedasticity in fixed effect regression model
H0: sigm(i)2 = sigm2 for all i
chi2 (13) = 2459.00
Prob = 0.0000

Wooldridge test for autocorrelation in panel data
H0: no first-order autocorrelation
F(3, 12) = 1.985
Prob > F = 0.1842

Table A26: Construction (II) - population to replace Y4

```
. xtregr y2 y3 lnpop y5, fe robust
Fixed-effects (within) regression                      Number of obs =  130
Group variable: m                                     Number of groups =  13
R-sq: within  = 0.5669                                 Obs per group: min =  10
                       between = 0.7632                           avg =  10.0
                       overall = 0.7443                         max =  10
corr(u_i, Xb) = -0.9909
F(4, 12) = 9.63                                         Prob > F   = 0.0010
(Std. Err. adjusted for 13 clusters in n)

<table>
<thead>
<tr>
<th>y</th>
<th>Robust</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Coef.</td>
<td>Std.</td>
<td>t</td>
<td>[95% Conf. Interval]</td>
</tr>
</tbody>
</table>
| y2         | 3.91068 | 10.00068 | 0.21 | 0.840 | -37.4926 | 45.32396
| y3         | -1.6159 | 33.02559 | -0.05 | 0.625 | -88.5455 | 55.36579
| lnpop      | -3.646449 | 5.122851 | -0.71 | 0.490 | -14.81118 | 7.512284
| y5         | 1.839626 | 0.9521864 | 2.01 | 0.068 | -1.914416 | 2.479495
| cons       | 0.0255 | 80.08325 | 0.36 | 0.961 | -113.4609 | 235.5119
| sigm u     | 4.1685117 |     |     |     |
| sigm e     | 0.96682626 |     |     |     |
| rho        | 0.1643 |     |     |     |
```

Modified Wald test for groupwise heteroskedasticity in fixed effect regression model
H0: sigm(i)2 = sigm2 for all i
chi2 (13) = 23714.64
Prob = 0.0000

Wooldridge test for autocorrelation in panel data
H0: no first-order autocorrelation
F(1, 12) = 2.104
Prob > F = 0.1643
Table A27: W/sale, Retail Trade; Hotels and Rest. (I)

```
. xtreg y2 y3 y4 y5, fe robust
Fixed-effects (within) regression
Number of obs = 130
Group variable: m
Number of groups = 13
R-sq: within = 0.3857
      Obs per group: min = 10
      between = 0.0766
      avg = 10.0
      overall = 0.0897
      max = 10
corr(u_i, Xb) = -0.3298
F(3, 12) = 22.93
Prob > F = 0.0000

(Std. Err. adjusted for 13 clusters in m)

| y    | Robust    | Coef.  | Std. Err. | t     | P>|t| | [95% Conf. Interval] |
|------|-----------|--------|-----------|-------|------|-----------------------|
| y2   | (dropped) |        |           |       |      |                       |
| y3   | 77.53143  | 81.46885| 0.95      | 0.360 | -99.97394 | 255.0368              |
| y4   | 14.88823  | 10.35349| 0.81      | 0.433 | -25.10662 | 54.86687              |
| y5   | -0.566977 | -0.323784| 1.24      | 0.001 | -2.775801 | 0.856673              |
| cons | -8.416104 | 18.19901 | 0.46   | 0.652 | -48.86834 | 31.23613              |

sigma_u 1.0183462
sigma_e 0.21391487
rho 0.95773915 (fraction of variance due to u_i)
```

Modified Wald test for groupwise heteroskedasticity in fixed effect regression model
H0: sigma(i)^2 = sigma^2 for all i
ch1 (12) = 15854.74
Prob>chi2 = 0.0000

Wooldridge test for autocorrelation in panel data
H0: no first-order autocorrelation
F(3, 12) = 1.819
Prob > F = 0.2024

Table A28: W/sale, Retail Trade; Hotels and Rest. (II) - population to replace Y4

```
. xtreg y2 y3 ln(y4) y5, fe robust
Fixed-effects (within) regression
Number of obs = 130
Group variable: m
Number of groups = 13
R-sq: within = 0.4010
      Obs per group: min = 10
      between = 0.2342
      avg = 10.0
      overall = 0.7562
      max = 10
corr(u_i, Xb) = -0.9909
F(4, 12) = 17.13
Prob > F = 0.0001

(Std. Err. adjusted for 13 clusters in m)

| y    | Robust    | Coef.  | Std. Err. | t     | P>|t| | [95% Conf. Interval] |
|------|-----------|--------|-----------|-------|------|-----------------------|
| y2   | -8.147728 | 10.59584 | -0.51 | 0.621 | -43.13613 | 26.84067              |
| y3   | 85.006902 | 55.94783 | 1.52   | 0.154 | -36.8494 | 206.9494             |
| ln(y4)| -2.756414 | 1.638235 | -1.68 | 0.119 | -6.318822 | 81.89943             |
| y5   | 0.594793  | 0.1564379 | 3.22 | 0.081 | 0.186383 | 1.002928             |
| cons | 51.434029 | 26.17944 | 1.96 | 0.073 | 5.605128 | 108.4751             |

sigma_u 3.4565356
sigma_e 0.21217494
rho 0.996244619 (fraction of variance due to u_i)
```

Modified Wald test for groupwise heteroskedasticity in fixed effect regression model
H0: sigma(i)^2 = sigma^2 for all i
ch1 (12) = 12190.45
Prob>chi2 = 0.0000

Wooldridge test for autocorrelation in panel data
H0: no first-order autocorrelation
F(1, 12) = 1.721
Prob > F = 0.2141
Changes in employment

Y1 = employment (t - (t-1)) / employment (t - 1)
X1 = immigrants from EECs (t - (t-1)) / total population (t - 1)
X2 = immigrants from MPCs (t - (t-1)) / total population (t - 1)
X3 = native people (t - (t-1)) / total population (t - 1)

Table A29: Mining and quarrying (I)

|   | Robust Coef. | Std. Err. | t | P>|t| | [95% Conf. Interval] |
|---|--------------|-----------|---|-----|---------------------|
| Y1 |              |           |   |     |                     |
|x1  | 2.838564     | 0.085     | 34| -8.192| 0.697546            |
|x2  | -12.45903    | 0.82      | -15| -15.041| 20.76348           |
|x3  | 2.131866     | 0.089     | 23| 23.84927| 7.348368          |
|cons| -.0185745    | 0.01343   | -1.44| 0.127| -.0432902 .0065412 |

Modified Wald test for groupwise heteroskedasticity
in fixed effect regression model
H0: sigma(i)|2 = sigma*2 for all i
chi2 (13) = 690.87
Prob=ch2 = 0.0000

Wooldridge test for autocorrelation in panel data
H0: no first-order autocorrelation
F(1, 12) = 0.258
Prob > F = 0.6207

Table A30: Mining and quarrying (II) - population to replace X3

|   | Robust Coef. | Std. Err. | t | P>|t| | [95% Conf. Interval] |
|---|--------------|-----------|---|-----|---------------------|
| x1  | 0.957452     | 1.906906  | 0.35| 0.730| -3.994322 .4985622 |
|x2  | -14.60521    | 15.58878  | -0.94| 0.387| -48.52667 19.34625 |
|dlnpop| 2.156283    | 2.412193  | 0.89| 0.389| -3.99945 7.412 |
|cons| -.0386534    | 0.033866  | -1.64| 0.127| -.0434627 0.006559 |

Modified Wald test for groupwise heteroskedasticity
in fixed effect regression model
H0: sigma(i)|2 = sigma*2 for all i
chi2 (13) = 690.92
Prob=ch2 = 0.0000

Wooldridge test for autocorrelation in panel data
H0: no first-order autocorrelation
F(1, 12) = 0.258
Prob > F = 0.6206
Table A31: Food products, beverages and tobacco (I)

```
x xreg y1 x1 x2 x3, fe cluster(n)
Fixed-effects (within) regression
 Number of obs = 117
Group variable: n  Number of groups = 13
R-sq: within = 0.0863  Obs per group: min = 9
between = 0.0862  avg = 9.0
overall = 0.0007  max = 9
corr(u_i, Xb) = -0.4715
```

(Std. Err. adjusted for 13 clusters in n)

| y1     | Robust Coef. | Std. Err. | t | P>|t| | [95% Conf. Interval] |
|--------|--------------|------------|---|-----|---------------------|
| x1     | -1.517677    | 2.958406   | -0.51 | 0.617 | -7.96349 | 4.928336 |
| x2     | -1.262337    | 11.54956   | -0.11 | 0.923 | -25.98891 | 23.46734 |
| x3     | -1.539014    | 0.021266   | -1.87 | 0.085 | -3.328431 | 0.250424 |
| _cons  | 0.602266     | 0.037843   | 0.60 | 0.560 | 0.0059793 | 0.1105113 |

sigma_u 0.01449154
sigma_e 0.04297526
rho -0.1605427 (fraction of variance due to u_i)

Modified Wald test for groupwise heteroskedasticity in fixed effect regression model

H0: sigma(i)^2 = sigma^2 for all i

chi2 (13) = 230.21
Prob>chi2 = 0.0000

Wooldridge test for autocorrelation in panel data

F(1, 12) = 5.488
Prob > F = 0.0384

Table A32: Food products, beverages and tobacco (II) - population to replace X3

```
x xreg y1 x1 x2 dlnpop, fe cluster(n)
Fixed-effects (within) regression
 Number of obs = 117
Group variable: n  Number of groups = 13
R-sq: within = 0.0863  Obs per group: min = 9
between = 0.0862  avg = 9.0
overall = 0.0007  max = 9
corr(u_i, Xb) = -0.4709
```

(Std. Err. adjusted for 13 clusters in n)

| y1     | Robust Coef. | Std. Err. | t | P>|t| | [95% Conf. Interval] |
|--------|--------------|------------|---|-----|---------------------|
| x1     | 0.206653     | 2.801857   | 0.01 | 0.994 | 6.684057 | 6.125388 |
| x2     | 0.284825     | 11.73599   | 0.02 | 0.981 | -25.28444 | 25.352885 |
| dlnpop | -1.5453      | 0.071909   | -1.17 | 0.246 | -2.315595 | 0.259939 |
| _cons  | 0.002287     | 0.003798   | 0.60 | 0.558 | -0.005972 | 0.0105628 |

sigma_u 0.01448657
sigma_e 0.04207526
rho -0.1598923 (fraction of variance due to u_i)

Modified Wald test for groupwise heteroskedasticity in fixed effect regression model

H0: sigma(i)^2 = sigma^2 for all i

chi2 (13) = 230.26
Prob>chi2 = 0.0000

Wooldridge test for autocorrelation in panel data

F(1, 12) = 5.412
Prob > F = 0.0383
Table A33: Light Manufacturing (I)

```
. xtreg y1 x1 x2 x3, fe robust
Fixed-effects (within) regression
Group variable: m                      Number of obs =  117
Number of groups =  13
R-sq: within = 0.0211        Obs per group: min =  9
        between = 0.0882        avg =  9.0
        overall = 0.0046        max =  9
                      F(3,12) = 3.8483
                      Prob > F = 0.03560
              (Std. Err. adjusted for 13 clusters in n)

<table>
<thead>
<tr>
<th>y1</th>
<th>Robust</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Coef.</td>
<td>Std. Err.</td>
<td>t</td>
<td>[95% Conf. Interval]</td>
</tr>
<tr>
<td>x1</td>
<td>-2.2322</td>
<td>0.6323</td>
<td>-3.55</td>
<td>-3.56 to -1.21</td>
</tr>
<tr>
<td>x2</td>
<td>0.0241</td>
<td>0.0144</td>
<td>1.69</td>
<td>0.00 to 0.05</td>
</tr>
<tr>
<td>x3</td>
<td>0.0085</td>
<td>0.0047</td>
<td>1.79</td>
<td>0.00 to 0.02</td>
</tr>
<tr>
<td></td>
<td>cons</td>
<td>0.0000</td>
<td>0.0000</td>
<td></td>
</tr>
<tr>
<td>sigma_u</td>
<td>0.0277</td>
<td>0.0038</td>
<td>7.39</td>
<td>0.02 to 0.04</td>
</tr>
<tr>
<td>sigma_e</td>
<td>0.0735</td>
<td>0.0495</td>
<td>1.48</td>
<td>0.02 to 0.13</td>
</tr>
<tr>
<td>rHO</td>
<td>0.1205</td>
<td>0.0282</td>
<td>4.27</td>
<td>0.07 to 0.17</td>
</tr>
</tbody>
</table>
```

Modified Wald test for groupwise heteroskedasticity in fixed effect regression model
H0: sigma(i)2 = sigma(2) for all i
ch12 (13) = 18614.72
Prob>ch12 = 0.0000

Wooldridge test for autocorrelation in panel data
H0: no first-order autocorrelation
F(1, 12) = 0.089
Prob > F = 0.7708

Table A34: Light Manufacturing (II) - population to replace X3

```
. xtreg y1 x1 x2 dinpop, fe robust
Fixed-effects (within) regression
Group variable: m                      Number of obs =  117
Number of groups =  13
R-sq: within = 0.0211        Obs per group: min =  9
        between = 0.0882        avg =  9.0
        overall = 0.0046        max =  9
                      F(3,12) = 3.8483
                      Prob > F = 0.03560
              (Std. Err. adjusted for 13 clusters in n)

<table>
<thead>
<tr>
<th>y1</th>
<th>Robust</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Coef.</td>
<td>Std. Err.</td>
<td>t</td>
<td>[95% Conf. Interval]</td>
</tr>
<tr>
<td>x1</td>
<td>-2.2322</td>
<td>0.6323</td>
<td>-3.55</td>
<td>-3.56 to -1.21</td>
</tr>
<tr>
<td>x2</td>
<td>0.0241</td>
<td>0.0144</td>
<td>1.69</td>
<td>0.00 to 0.05</td>
</tr>
<tr>
<td>dinpop</td>
<td>0.0085</td>
<td>0.0047</td>
<td>1.79</td>
<td>0.00 to 0.02</td>
</tr>
<tr>
<td></td>
<td>cons</td>
<td>0.0000</td>
<td>0.0000</td>
<td></td>
</tr>
<tr>
<td>sigma_u</td>
<td>0.0277</td>
<td>0.0038</td>
<td>7.39</td>
<td>0.02 to 0.04</td>
</tr>
<tr>
<td>sigma_e</td>
<td>0.0735</td>
<td>0.0495</td>
<td>1.48</td>
<td>0.02 to 0.13</td>
</tr>
<tr>
<td>rHO</td>
<td>0.1205</td>
<td>0.0282</td>
<td>4.27</td>
<td>0.07 to 0.17</td>
</tr>
</tbody>
</table>
```

Modified Wald test for groupwise heteroskedasticity in fixed effect regression model
H0: sigma(i)2 = sigma(2) for all i
ch12 (13) = 18400.14
Prob>ch12 = 0.0000

Wooldridge test for autocorrelation in panel data
H0: no first-order autocorrelation
F(1, 12) = 0.091
Prob > F = 0.7687
Table A35: Heavy Manufacturing (I)

```
.xtreg y1 x1 x2 x3, fe robust
Fixed-effects (within) regression                       Number of obs  =  117
Group variable: m                                       Number of groups =  13
R-sq: within = 0.8315                      Obs per group: min =  9
          between = 0.0071                      avg =  9.0
          overall = 0.0245                     max =  9
corr(u_i, Xb) = -0.1499
F(3,12)   =  0.64
Prob > F   =  0.6841
             (Std. Err. adjusted for 13 clusters in n)

     |      Robust
     |      Coef.  Std. Err.     t    95% Conf. Interval
-------------|------------------------------------------------------------------
    x1 |  -1.568007   2.681787    -0.59   -6.000020    2.868205
    x2 |   2.69017    21.06334    0.13     0.242    -20.74096    26.52347
    x3 |  -2.076229   2.57361   -0.81    -8.277644    2.937186
    _cons|  0.003407   0.011608    0.28     0.800     0.055375    0.134639

Modified Wald test for groupwise heteroskedasticity
in fixed effect regression model
H0: sigma(i)^2 = sigma2 for all i
chi2 (13)  = 1789.90
Prob=chi2  = 0.0000

Wooldridge test for autocorrelation in panel data
H0: no first-order autocorrelation
F(1,12) = 2.036
Prob > F = 0.6841
```

Table A36: Heavy Manufacturing (II) - population to replace X3

```
.xtreg y1 x1 x2 dlnpop, fe robust
Fixed-effects (within) regression                       Number of obs  =  117
Group variable: m                                       Number of groups =  13
R-sq: within = 0.8315                      Obs per group: min =  9
          between = 0.0071                      avg =  9.0
          overall = 0.0245                     max =  9
corr(u_i, Xb) = -0.1487
F(3,12)   =  0.64
Prob > F   =  0.6850
             (Std. Err. adjusted for 13 clusters in n)

     |      Robust
     |      Coef.  Std. Err.     t    95% Conf. Interval
-------------|------------------------------------------------------------------
    x1 |   2.511371   2.857931    0.88    -0.397    3.315527
    x2 |   29.47118   22.92743    1.29     0.321   -20.36338    79.32776
    dlnpop| -2.684263   2.190958   -1.23    -8.348269    2.971943
    _cons|  0.003301   0.011668    0.28     0.800     0.010664    0.134724

Modified Wald test for groupwise heteroskedasticity
in fixed effect regression model
H0: sigma(i)^2 = sigma2 for all i
chi2 (13)  = 1783.13
Prob=chi2  = 0.0000

Wooldridge test for autocorrelation in panel data
H0: no first-order autocorrelation
F(1,12) = 2.036
Prob > F = 0.6850
```
Table A37: Electricity, gas and water supply (I)

```
xreg y1 x2 x3, fe robust
Fixed-effects (within) regression
Number of obs  = 117
Group variable: a
Number of groups = 13
R-sq: within  = 0.8115  Obs per group: min = 9
between  = 0.1557  avg = 9.0
overall  = 0.0267  max = 9
F(3,12)  = 1.10
Prob > F = 0.3807
(Std. Err. adjusted for 13 clusters in n)
y |     Robust     Std. Err.     t    P>|t|    [95% Conf. Interval]
---------+-------------------------------------------------------------
x1 |        4.876119    5.035444   0.97   0.352    -6.955172    15.84741
x2 |        4.031504    21.11099   0.12   0.891    -43.34326    53.00627
x3 |        3.212526    2.087078   1.54   0.150   -1.334825    7.759878
_cons |       -0.0229599   .0097606  -2.36   0.036   -.0441331    .0018967
sigma_u |       .02143799
sigma_e |       .00614855
rho    |       (fraction of variance due to u_i)
```

Modified Wald test for groupwise heteroskedasticity in fixed effect regression model

H0: sigma(i)^2 = sigma^2 for all i
chi2 (13) = 11763.82
Prob(chi2 = 0.0000

Wooldridge test for autocorrelation in panel data
H0: no first-order autocorrelation
F(1, 12) = 1.877
Prob > F = 0.3807

Table A38: Electricity, gas and water supply (II) - population to replace X3

```
xreg y1 x2 dlipop, fe robust
Fixed-effects (within) regression
Number of obs  = 117
Group variable: a
Number of groups = 13
R-sq: within  = 0.8115  Obs per group: min = 9
between  = 0.1557  avg = 9.0
overall  = 0.0267  max = 9
F(3,12)  = 1.10
Prob > F = 0.3807
(Std. Err. adjusted for 13 clusters in n)
y |     Robust     Std. Err.     t    P>|t|    [95% Conf. Interval]
---------+-------------------------------------------------------------
x1 |        4.665826    5.007096   0.33   0.745   -9.243699    12.57535
x2 |        0.097357    22.61612   0.07   0.944    -46.8960    50.11187
dlipop |       3.229865    2.102609   1.53   0.121   -1.357862    7.817593
_cons |       -0.0229599   .0097592  -2.36   0.036   -.0442495    .0018223
sigma_u |       .02143297
sigma_e |       .00692084
rho    |       (fraction of variance due to u_i)
```

Modified Wald test for groupwise heteroskedasticity in fixed effect regression model

H0: sigma(i)^2 = sigma^2 for all i
chi2 (13) = 11767.38
Prob(chi2 = 0.0000

Wooldridge test for autocorrelation in panel data
H0: no first-order autocorrelation
F(1, 12) = 1.877
Prob > F = 0.3807
Table A39: Construction (I)

```
xreg y1 x1 x2 x3, fe robust
Fixed-effects (within) regression
Number of obs = 117
Group variable: n
Number of groups = 13
R-sq: within = 0.0164
Observations per group: min = 9
between = 0.3262
avg = 9.0
overall = 0.0045
max = 9

Corr(u_i, Xb) = -0.3574
F(3, 12) = 3.47
Prob > F = 0.0509

(Std. Err. adjusted for 13 clusters in n)

<table>
<thead>
<tr>
<th>y1</th>
<th>Robust</th>
<th>Coef.</th>
<th>Std. Err.</th>
<th>t</th>
<th>[95% Conf. Interval]</th>
</tr>
</thead>
<tbody>
<tr>
<td>x1</td>
<td></td>
<td>-22.35255</td>
<td>21.21779</td>
<td>-1.05</td>
<td>0.313</td>
</tr>
<tr>
<td>x2</td>
<td></td>
<td>78.19556</td>
<td>42.94998</td>
<td>1.82</td>
<td>0.094</td>
</tr>
<tr>
<td>x3</td>
<td></td>
<td>5.046003</td>
<td>6.318253</td>
<td>0.80</td>
<td>0.440</td>
</tr>
<tr>
<td>cons</td>
<td></td>
<td>0.112637</td>
<td>0.307797</td>
<td>0.37</td>
<td>0.721</td>
</tr>
</tbody>
</table>

sigma_u       = .05216073
sigma_e      = .22322164
rho           = .05177568

Modified Wald test for groupwise heteroskedasticity
in fixed effect regression model
H0: sigma(i)^2 = sigma'2 for all i
chi2 (13) = 1.6e+05
Prob=chi2 = 0.0000

Wooldridge test for autocorrelation in panel data
H0: no first-order autocorrelation
F(1, 12) = 2.226
Prob > F = 0.1530
```

Table A40: Construction (II) - population to replace X3

```
xreg y1 x1 x2 dlnpop, fe robust
Fixed-effects (within) regression
Number of obs = 117
Group variable: n
Number of groups = 13
R-sq: within = 0.0164
Observations per group: min = 9
between = 0.3278
avg = 9.0
overall = 0.0045
max = 9

Corr(u_i, Xb) = -0.3561
F(3, 12) = 3.47
Prob > F = 0.0509

(Std. Err. adjusted for 13 clusters in n)

<table>
<thead>
<tr>
<th>y1</th>
<th>Robust</th>
<th>Coef.</th>
<th>Std. Err.</th>
<th>t</th>
<th>[95% Conf. Interval]</th>
</tr>
</thead>
<tbody>
<tr>
<td>x1</td>
<td></td>
<td>-27.38829</td>
<td>17.76619</td>
<td>-1.54</td>
<td>0.149</td>
</tr>
<tr>
<td>x2</td>
<td></td>
<td>73.14934</td>
<td>46.32523</td>
<td>1.59</td>
<td>0.144</td>
</tr>
<tr>
<td>dlnpop</td>
<td></td>
<td>5.039588</td>
<td>6.373667</td>
<td>0.79</td>
<td>0.444</td>
</tr>
<tr>
<td>cons</td>
<td></td>
<td>0.011381</td>
<td>0.030937</td>
<td>0.37</td>
<td>0.719</td>
</tr>
</tbody>
</table>

sigma_u       = .05211532
sigma_e      = .22322581
rho           = .05168839

Modified Wald test for groupwise heteroskedasticity
in fixed effect regression model
H0: sigma(i)^2 = sigma'2 for all i
chi2 (13) = 1.6e+05
Prob=chi2 = 0.0000

Wooldridge test for autocorrelation in panel data
H0: no first-order autocorrelation
F(1, 12) = 2.226
Prob > F = 0.1534
Table A41: W/sale, Retail Trade; Hotels and Rest. (I)

```
.xtreg y1 x1 x2 x3, fe cluster(n)
Fixed-effects (within) regression
Number of obs =  117
Group variable: n  Number of groups = 13
R-sq:       within = 0.0525  Obs per group: min = 9
between = 0.0065  avg = 9.0
     overall = 0.0124  max = 9
F(3,12) = 1.46  Prob > F = 0.2759
(Std. Err. adjusted for 13 clusters in n)
```

**Modified Wald test for groupwise heteroskedasticity**
in fixed effect regression model

H0: sigma(i)^2 = sigma2 for all i

```
chi2 (13) = 1.1e+06  Prob=chi2 = 0.0000
```

**Wooldridge test for autocorrelation in panel data**
H0: no first-order autocorrelation

```
F(3,12) = 33.323  Prob > F = 0.0000
```

Table A42: W/sale, Retail Trade; Hotels and Rest. (II) - population to replace X3

```
.xtreg y1 x1 x2 dinpop, fe cluster(n)
Fixed-effects (within) regression
Number of obs =  117
Group variable: n  Number of groups = 13
R-sq:       within = 0.0522  Obs per group: min = 9
between = 0.0061  avg = 9.0
     overall = 0.0124  max = 9
F(3,12) = 1.45  Prob > F = 0.2783
(Std. Err. adjusted for 13 clusters in n)
```

**Modified Wald test for groupwise heteroskedasticity**
in fixed effect regression model

H0: sigma(i)^2 = sigma2 for all i

```
chi2 (13) = 1.1e+06  Prob=chi2 = 0.0000
```

**Wooldridge test for autocorrelation in panel data**
H0: no first-order autocorrelation

```
F(3,12) = 33.323  Prob > F = 0.0000
```
Employment

\[ Y = \text{employment} \]
\[ Y2 = \text{immigrants from EECs / total population} \]
\[ Y3 = \text{immigrants from MPCs / total population} \]
\[ Y4 = \text{native population / total population} \]

Table A43: Mining and quarrying (I)

| \( \text{y} \) | Robust Coef. | Std. Err. | t | P>|t| | [95% Conf. Interval] |
| --- | --- | --- | --- | --- | --- |
| \( y2 \) | -53.3734 | 50.9678 | -1.05 | 0.316 | -164.4644 |
| \( y3 \) | -2.615490 | 7.659365 | -0.34 | 0.738 | -29.30782 |
| \( y4 \) | 12.224090 | 7.669252 | 1.00 | 0.316 | -4.466390 |
| \( \text{cons} \) | 1.091735 |
| \( \text{sigmu} \) | 0.99143632 |
| \( \text{sigmu} e \) | 0.99412258 |

Modified Wald test for groupwise heteroskedasticity in fixed effect regression model

\( \text{H0: } \text{sigma}(i)^2 = \text{sigma}^2 \text{ for all } i \)
\( \text{chisq}_{12} = 4143.41 \)
\( \text{Prob} > \text{chisq}_{12} = 0.0000 \)

Wooldridge test for autocorrelation in panel data

\( \text{F(1, 12)} = 66.072 \)
\( \text{Prob} > F = 0.0000 \)

Table A44: Mining and quarrying (II) - population to replace \( Y4 \)

| \( \text{y} \) | Robust Coef. | Std. Err. | t | P>|t| | [95% Conf. Interval] |
| --- | --- | --- | --- | --- | --- |
| \( y2 \) | 9.082087 | 7.619650 | 1.19 | 0.256 | -7.519526 |
| \( y3 \) | -2.798808 | 62.968886 | -0.04 | 0.665 | -164.3746 |
| \( \text{lnpop} \) | -1.410316 | 1.154379 | -1.23 | 0.224 | -3.934492 |
| \( \text{cons} \) | 33.34977 | 19.28764 | 1.73 | 0.109 | -8.674436 |
| \( \text{sigmu} \) | 2.5866155 |
| \( \text{sigmu} e \) | 0.99881031 |

Modified Wald test for groupwise heteroskedasticity in fixed effect regression model

\( \text{H0: } \text{sigma}(i)^2 = \text{sigma}^2 \text{ for all } i \)
\( \text{chisq}_{12} = 1422.47 \)
\( \text{Prob} > \text{chisq}_{12} = 0.0000 \)

Wooldridge test for autocorrelation in panel data

\( \text{F(1, 12)} = 61.543 \)
\( \text{Prob} > F = 0.0000 \)
Table A45: Food products, beverages and tobacco (I)

```
xteg y y3 y4, fe cluster(n)
Fixed-effects (within) regression
Number of obs =  130
Group variable: n  Number of groups =  13
R-sq: within =  0.0459  Obs per group: min =  10
            between =  0.0617  avg =  10.0
            overall =  0.0069  max =  10
corr(u_i, Xb) =  -0.0462  F(2, 12) =  3.11
            Prob > F =  0.0210
```

(Std. Err. adjusted for 13 clusters in n)

<table>
<thead>
<tr>
<th>y</th>
<th>Robust Coef.</th>
<th>Std. Err.</th>
<th>t</th>
<th>95% Conf. Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>y2</td>
<td>(dropped)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>y3</td>
<td>35.04311</td>
<td>35.77764</td>
<td>0.98</td>
<td>-42.90972</td>
</tr>
<tr>
<td>y4</td>
<td>-0.062321</td>
<td>0.30897</td>
<td>-0.01</td>
<td>-0.992</td>
</tr>
<tr>
<td>sigma_u</td>
<td>1.2986173</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>sigma_e</td>
<td>.95254597</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>rho</td>
<td>-.98834525</td>
<td>(fraction of variance due to u_i)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Modified Wald test for groupwise heteroskedasticity in fixed effect regression model
H0: sigma(i)^2 = sigma^2 for all i
chi2 (13) =  751.11
Prob>chi2 =  0.0000

Wooldridge test for autocorrelation in panel data
H0: no first-order autocorrelation
F(12) = 10.166
Prob > F = 0.0078

Table A46: Food products, beverages and tobacco (II) - population to replace Y4

```
xteg y y3 lnpop, fe cluster(n)
Fixed-effects (within) regression
Number of obs =  130
Group variable: n  Number of groups =  13
R-sq: within =  0.1767  Obs per group: min =  10
            between =  0.3768  avg =  10.0
            overall =  0.3757  max =  10
corr(u_i, Xb) =  -0.8967  F(3, 12) =  4.43
            Prob > F =  0.0257
```

(Std. Err. adjusted for 13 clusters in n)

<table>
<thead>
<tr>
<th>y</th>
<th>Robust Coef.</th>
<th>Std. Err.</th>
<th>t</th>
<th>95% Conf. Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>y2</td>
<td>5.782799</td>
<td>3.163023</td>
<td>1.83</td>
<td>-1.188377</td>
</tr>
<tr>
<td>y3</td>
<td>55.32822</td>
<td>33.99638</td>
<td>1.67</td>
<td>-16.78261</td>
</tr>
<tr>
<td>lnpop</td>
<td>-1.256344</td>
<td>.6127483</td>
<td>-2.05</td>
<td>-2.591446</td>
</tr>
<tr>
<td></td>
<td>32.63267</td>
<td>10.23967</td>
<td>3.19</td>
<td>10.32236</td>
</tr>
<tr>
<td>sigma_u</td>
<td>2.3014756</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>sigma_e</td>
<td>.9492633</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>rho</td>
<td>-.99594315</td>
<td>(fraction of variance due to u_i)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Modified Wald test for groupwise heteroskedasticity in fixed effect regression model
H0: sigma(i)^2 = sigma^2 for all i
chi2 (13) =  175.91
Prob>chi2 =  0.0000

Wooldridge test for autocorrelation in panel data
H0: no first-order autocorrelation
F(1, 12) = 11.580
Prob > F =  0.0052
Table A47: Light Manufacturing (I)

```
. xtdr y2 y3 y4, fe cluster(n)
Fixed-effects (within) regression Number of obs = 130
Group variable: n Number of groups = 13
R-sq: within = 0.0297 Obs per group: min = 10
between = 0.0005 avg = 10.0
overall = 0.0001 max = 10
corr(u_i, Xb) = -0.0344
F[2, 12] = 0.88 Prob > F = 0.4401
(Std. Err. adjusted for 13 clusters in n)

| y   | Coef. | Std. Err. | t     | P>|t|   | [95% Conf. Interval] |
|-----|-------|-----------|-------|-------|---------------------|
| y2  | (dropped) |          |       |       |                     |
| y3  | 6.53713 | 50.54801 | 0.13  | 0.89  | 71.5323 to 70.7567  |
| y4  | 5.67693 | 9.10491  | 0.61  | 0.55  | 9.4014 to 7.9524   |
| _cons| 3.68165 | 9.204759 | 0.40  | 0.69  | -16.3793 to 13.0396|

sigma_u = 1.0456492
sigma_e = .957323
rho = 0.9154733 (fraction of variance due to u_i)
```

Modified Wald test for groupwise heteroskedasticity in fixed effect regression model

H0: sigma(i)^2 = sigma^2 for all i

ch2 (13) = 5511.60
Prob>ch2 = 0.0000

Wooldridge test for autocorrelation in panel data

H0: no first-order autocorrelation

F[1, 12] = 4.78
Prob > F = 0.039

Table A48: Light Manufacturing (II) - population to replace Y4

```
. xtdr y2 y3 lnop, fe cluster(n)
Fixed-effects (within) regression Number of obs = 130
Group variable: n Number of groups = 13
R-sq: within = 0.2800 Obs per group: min = 10
between = 0.9364 avg = 10.0
overall = 0.9271 max = 10
corr(u_i, Xb) = -0.9974
F[3, 12] = 2.53 Prob > F = 0.1068
(Std. Err. adjusted for 13 clusters in n)

| y   | Coef. | Std. Err. | t     | P>|t|   | [95% Conf. Interval] |
|-----|-------|-----------|-------|-------|---------------------|
| y2  | -2.50882 | 4.281084 | 0.62  | 0.54  | -6.73788 to 7.73556  |
| y3  | 106.997 | 46.43243 | 2.31  | 0.20  | 0.05 to 207.93778  |
| lnop| -2.715838 | 1.060738 | -2.55 | 0.02  | -5.490161 to 0.0644  |
| _cons| 58.72877 | 17.85171 | 3.29  | 0.00  | 10.8760 to 97.2640  |

sigma_u = 3.7695217
sigma_e = 0.0691265
rho = 0.99946859 (fraction of variance due to u_i)
```

Modified Wald test for groupwise heteroskedasticity in fixed effect regression model

H0: sigma(i)^2 = sigma^2 for all i

ch2 (13) = 20649.15
Prob>ch2 = 0.0000

Wooldridge test for autocorrelation in panel data

H0: no first-order autocorrelation

F[1, 12] = 5.788
Prob > F = 0.0330
Table A49: Heavy Manufacturing (I)

```
xreg y y3 y4, fe cluster(n)
```

|                 | Coef. | Std. Err. | t     | P>|t|  | [95% Conf. Interval] |
|-----------------|-------|-----------|-------|------|-----------------------|
| y               |       |           |       |      |                       |
| y2              | 0.31  | 0.03      | 10.6  | 0.00| 0.251 - 0.361         |
| y3              | 0.01  | 0.00      | 10.0  | 0.01| 0.001 - 0.009         |
| cons            | 0.00  | 0.00      | 10.0  | 0.01| 0.000 - 0.001         |
| sigma u         | 1.27  | 0.00      | 63.3  | 0.00|                       |
| sigma e         | 0.99  | 0.00      | 20.0  | 0.00|                       |
| rho             | 0.97  | 0.00      | 98.7  | 0.00|                       |

Modified Wald test for groupwise heteroskedasticity in fixed effect regression model

H0: sigma(i)^2 = sigma^2 for all i

chi2 (13) = 2163.51
Prob>chi2 = 0.0000

Wooldridge test for autocorrelation in panel data

H0: no first-order autocorrelation

F(1, 12) = 11.54
Prob > F = 0.0031

Table A50: Heavy Manufacturing (II) - population to replace Y4

```
xreg y y3 lnpop, fe cluster(n)
```

|                 | Coef. | Std. Err. | t     | P>|t|  | [95% Conf. Interval] |
|-----------------|-------|-----------|-------|------|-----------------------|
| y               |       |           |       |      |                       |
| y2              | -3.34 | 0.35      | -9.5  | 0.00| -3.997 - -2.682       |
| y3              | 0.79  | 0.11      | 7.2   | 0.00| 0.586 - 1.001         |
| lnpop           | -1.63 | 0.22      | -7.4  | 0.00| -2.059 - -1.203       |
| cons            | 0.30  | 0.03      | 11.6  | 0.00| 0.250 - 0.344         |
| sigma u         | 2.73  | 0.66      | 4.0   | 0.00|                       |
| sigma e         | 0.99  | 0.09      | 10.9  | 0.00|                       |
| rho             | 0.99  | 0.00      | 99.8  | 0.00|                       |

Modified Wald test for groupwise heteroskedasticity in fixed effect regression model

H0: sigma(i)^2 = sigma^2 for all i

chi2 (13) = 456.75
Prob>chi2 = 0.0000

Wooldridge test for autocorrelation in panel data

H0: no first-order autocorrelation

F(1, 12) = 13.96
Prob > F = 0.0035
Table A51: Electricity, gas and water supply (I)

```
xtest y2 y3 y4 y5, fe cluster(n)
Fixed-effects (within) regression
Number of obs =  130
Group variable: m
Number of groups =  13
R-sq: within =  0.2932  Obs per group: min =  10
between =  0.3080  avg =  10.0
overall =  0.3921  max =  10
corr(u_i, Xb) = -0.3329  F(3,12) =  2.73
Prob > F =  0.0983
(Std. Err. adjusted for 13 clusters in n)

| y      | Robust   | Coef. | Std. Err. | t     | P>|t| | [95% Conf. Interval] |
|--------|----------|-------|-----------|-------|-----|----------------------|
| y2     | (dropped)|       |           |       |     |                      |
| y3     | 167.4189 | 134.884 | 1.24 | 0.238 | 126.2938 | 461.1217 |
| y4     | 14.78333 | 30.32633 | -0.43 | 0.674 | -0.573999 | 0.007732 |
| y5     | 1.037758 | 0.3914173 | 2.65 | 0.021 | 0.849326 | 1.089502 |
| cons   | 13.09371 | 35.03086 | 0.37 | 0.715 | -63.231999 | 89.41941 |

sigma_u 1.0201014
sigma_e .2535596
rho .99099988 (fraction of variance due to u_i)

Modified Wald test for groupwise heteroskedasticity in fixed effect regression model
H0: sigma(i)^2 = sigma^2 for all i
chi2 (13) =  41722.91
Prob>chi2 =  0.0000

Wooldridge test for autocorrelation in panel data
H0: no first-order autocorrelation
F(1, 12) =  25.396
Prob > F =  0.0003
```

Table A52: Electricity, gas and water supply (II) - population to replace Y4

```
xtest y2 y3 lnpop y5, fe cluster(n)
Fixed-effects (within) regression
Number of obs =  130
Group variable: m
Number of groups =  13
R-sq: within =  0.7159  Obs per group: min =  10
between =  0.1065  avg =  10.0
overall =  0.1036  max =  10
corr(u_i, Xb) = -0.9958  F(4,12) =  324.03
Prob > F =  0.0000
(Std. Err. adjusted for 13 clusters in n)

| y      | Robust   | Coef. | Std. Err. | t     | P>|t| | [95% Conf. Interval] |
|--------|----------|-------|-----------|-------|-----|----------------------|
| y2     | -29.32877 | 19.99351 | -1.47 | 0.020 | -53.28167 | -5.376074 |
| y3     | 5.519625  | 104.4741 | 0.05 | 0.959 | -222.1098 | 233.1491 |
| lnpop  | 12.10346  | 22.28795 | 5.88 | 0.000 | 5.251065 | 17.95523 |
| y5     | 0.2081923 | 0.2141403 | 0.97 | 0.350 | -0.2584655 | 0.776023 |
| cons   | -214.6661 | 36.42509 | -5.88 | 0.000 | -293.4296 | -134.7626 |

sigma_u 13.043973
sigma_e .14744217
rho .99907225 (fraction of variance due to u_i)

Modified Wald test for groupwise heteroskedasticity in fixed effect regression model
H0: sigma(i)^2 = sigma^2 for all i
chi2 (13) =  2832.38
Prob>chi2 =  0.0000

Wooldridge test for autocorrelation in panel data
H0: no first-order autocorrelation
F(1, 12) =  25.580
Prob > F =  0.0003
```
Table A53: Construction (I)

```plaintext
.xtreg y2 y3 y4 y5, fe robust
Fixed-effects (within) regression
Number of obs = 130
Group variable: m
Number of groups = 13
R-sq: within = 0.5451
Obs per group: min = 10
between = 0.2065
avg = 10.0
overall = 0.2057
max = 10

corr(u_i, Xb) = -0.5383
F(3,12) = 7.02
Prob > F = 0.0056
(Std. Err. adjusted for 13 clusters in n)

| y     | Robust | Coef. | Std. Err. | t     | P>|t| | [95% Conf. Interval] |
|-------|--------|-------|-----------|-------|-----|---------------------|
| y2    | (dropped) |       |           |       |     |                     |
| y3    | -47.19967 | 65.83421 | -0.72 | 0.487 | -10.906301 | 96.25975 |
| y4    | 4.366879 | 10.70556 | 0.40 | 0.693 | -19.1615 | 27.88326 |
| y5    | 0.673017 | 0.321763 | 3.01 | 0.031 | 0.2662577 | 1.468526 |
| _cons | -2.20785 | 9.087008 | -0.24 | 0.812 | -22.00674 | 17.59104 |

Mod. Wald test for groupwise heteroskedasticity in fixed effect regression model
H0: sigma(i)^2 = sigma^2 for all i
chi2 (13) = 4288.57
Prob>chi2 = 0.0000

Wooldridge test for autocorrelation in panel data
H0: no first-order autocorrelation
F(1, 12) = 1.962
Prob > F = 0.3231
```

Table A54: Construction (II) - population to replace Y4

```plaintext
.xtreg y2 y3 lnop y5, fe robust
Fixed-effects (within) regression
Number of obs = 130
Group variable: m
Number of groups = 13
R-sq: within = 0.5669
Obs per group: min = 10
between = 0.7632
avg = 10.0
overall = 0.7643
max = 10

corr(u_i, Xb) = -0.9909
F(4,12) = 9.63
Prob > F = 0.0010
(Std. Err. adjusted for 13 clusters in n)

| y      | Robust | Coef. | Std. Err. | t     | P>|t| | [95% Conf. Interval] |
|-------|--------|-------|-----------|-------|-----|---------------------|
| y2    | 3.910681 | 19.000681 | 0.21 | 0.040 | -27.4926 | 45.32396 |
| y3    | -16.589 | 33.02559 | -0.50 | 0.625 | -66.9559 | 59.36759 |
| lnop  | -3.640449 | 5.028251 | -0.71 | 0.490 | -14.81118 | 7.522284 |
| y5    | 1.839926 | 0.5922064 | 2.01 | 0.068 | 1.3014416 | 2.379495 |
| _cons | 61.0255 | 90.06325 | 0.76 | 0.461 | -113.4609 | 235.5119 |

Mod. Wald test for groupwise heteroskedasticity in fixed effect regression model
H0: sigma(i)^2 = sigma^2 for all i
chi2 (13) = 8134.55
Prob>chi2 = 0.0000

Wooldridge test for autocorrelation in panel data
H0: no first-order autocorrelation
F(1, 12) = 0.846
Prob > F = 0.3752
```

Table A55: W/sale, Retail Trade; Hotels and Rest. (I)

<table>
<thead>
<tr>
<th>y</th>
<th>Robust</th>
<th>Coef.</th>
<th>Std. Err.</th>
<th>t</th>
<th>[95% Conf. Interval]</th>
</tr>
</thead>
<tbody>
<tr>
<td>y2</td>
<td>(dropped)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>y3</td>
<td>77.53143</td>
<td>81.46685</td>
<td>0.95</td>
<td>0.360</td>
<td>-99.97394 - 255.0368</td>
</tr>
<tr>
<td>y4</td>
<td>14.88823</td>
<td>10.35249</td>
<td>0.81</td>
<td>0.433</td>
<td>-25.18642 - 54.86687</td>
</tr>
<tr>
<td>y5</td>
<td>.566977</td>
<td>.1337946</td>
<td>4.24</td>
<td>0.061</td>
<td>.2795801 - .8566873</td>
</tr>
<tr>
<td>cons</td>
<td>-8.416104</td>
<td>18.19901</td>
<td>-0.46</td>
<td>0.652</td>
<td>-48.66384 - 31.23613</td>
</tr>
</tbody>
</table>

Sigma u: 1.0183462
Sigma e: .21931487
rho: .95773915 (fraction of variance due to u_i)

Modified Wald test for groupwise heteroskedasticity in fixed effect regression model.
H0: sigma(i)^2 = sigma^2 for all i
chi2 (13) = 65624.57
Prob=chi2 = 0.0000

Wooldridge test for autocorrelation in panel data.
H0: no first-order autocorrelation
F(1, 12) = 1046.216
Prob > F = 0.0000

Table A56: W/sale, Retail Trade; Hotels and Rest. (II) - population to replace Y4

<table>
<thead>
<tr>
<th>y</th>
<th>Robust</th>
<th>Coef.</th>
<th>Std. Err.</th>
<th>t</th>
<th>[95% Conf. Interval]</th>
</tr>
</thead>
<tbody>
<tr>
<td>y2</td>
<td>-8.147728</td>
<td>16.05847</td>
<td>-0.51</td>
<td>0.621</td>
<td>-43.13613 - 26.86467</td>
</tr>
<tr>
<td>y3</td>
<td>85.05602</td>
<td>55.94763</td>
<td>1.52</td>
<td>0.154</td>
<td>-36.84094 - 206.9494</td>
</tr>
<tr>
<td>lnpop</td>
<td>-2.750421</td>
<td>1.638235</td>
<td>-1.68</td>
<td>0.119</td>
<td>-6.318822 - .818894</td>
</tr>
<tr>
<td>y5</td>
<td>.6594793</td>
<td>.1364379</td>
<td>4.72</td>
<td>0.035</td>
<td>.3186355 - 1.000528</td>
</tr>
<tr>
<td>cons</td>
<td>51.43497</td>
<td>26.17944</td>
<td>1.96</td>
<td>0.073</td>
<td>-5.665128 - 108.4751</td>
</tr>
</tbody>
</table>

Sigma u: 3.4565356
Sigma e: .21217404
rho: .99624610 (fraction of variance due to u_i)

Modified Wald test for groupwise heteroskedasticity in fixed effect regression model.
H0: sigma(i)^2 = sigma^2 for all i
chi2 (13) = 2.76e+06
Prob=chi2 = 0.0000

Wooldridge test for autocorrelation in panel data.
H0: no first-order autocorrelation
F(1, 12) = 955.471
Prob > F = 0.0000