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The battle between biofuels and food -example in the United States

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Abstract: In recent years,Themarket for major clothing products has seen a significant price fluctuation in the overall balance of supply and demand in the year,Even in case of slightly greater than request,pricegoes up.on this,Typical supply-demand relationship difficult to explain,Biofuels etcNon-traditional factors are considered importantfactors.with the world's largest producer of biofuels in the United States for example,through contrast analysisits biofuel production,price of major energy crops and related alternative crops,production,The change of consumption pattern to studytherelationship between the development of the fuel and the fluctuation of the grain market in,results show us biofuel development stimulates energy crop jadem,Increase in soybean prices,and bring a change in the pattern of production and consumption,and further affects the substitution of cotton for crops withproduction,which leads to a rise in cotton prices,But the extent of the impact is subject to further study.

Keywords: Biofuels;Food;Market Volatility

1. Introduction

Biofuels are with food security,Tight combination of energy security and environmental securityaTopic.in the pastmoreYear,Multiple factors add people to biofuels,particular interest in bio-liquid fuels,such as Arabian oil banop,Concerns about greenhouse gas emissions and environmental safety,Continuous increase in demand for gasoline,et cetera.but,Current Biologyproduction of fuel is still mainly in corn,soy,sugarcane,rapeseed etc crops as raw materials,second generation,Three generationsEnergy raw material development has achieved some results,but still in pilot phase,could not be used for mass production,So with a large number ofcrops are converted tobiofuels,all walks of life start focusing on biomass fuels' 'with peoplefor food,with grain scramble""problem.especially2006second half to2008Year two years,Global food prices have soared.According to International Monetary Funddata calculation,2006year7(month through) [] [@] () (+)2008year7Month, theGlobal food price rises as highas the,3,For the nextsix monthsprice drop sharply,but2009Theyear ushered in a new round of price increases.fluctuations in grain prices for productionpeople,Consumers and the macro economy have a significant impact^.from a National macro perspective,Food prices continue fastfast growing net food importer,In particular, developing countries have brought a heavy blowto the;from the microscopicperspective of the residents,food pricefast growing for agricultural consumers,Especially Low-and middle-income people will cause significant negative effects.so,this-Thesharp fluctuations in the prices of agricultural products during the period have caused a greater global impact onthe"" "thefood and fuel debate"""Fierce argument.

Year8Month,the largest private oil enterprise committee in the countryaChina Commerce Federation Oil Circulation CommissionWill book theNational Development and Reform Commission,calling for an immediate halt to domestic corn ethanol gasoline projects,because it was foundin the survey,inaccept a date:2012-8-20.

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The temptation of the country's high subsidy,Some ethanol plants in Heilongjiang and other parts of the province are now starting to use corn to produce ethanol gasoline for cars,and buying a lot of corn,cause'cars compete with the peoplefor corn ",cause domesticFirst in the first half of theyear corn netimportstatus,and drives up the price of corn,also because aquaculture does not have a state subsidy policy,cannot withstandHighfeed corn price,Which leads to the shortage of supply of agricultural products in the market.,price rise,and Corn bthe production of ethanol gasoline is negligible relative to domestic demand for petrol.But there are also views that contradict this.,as un ringUNEPExecutive DirectorSTEINERAindicates that further research is needed to understand the impact of biofuels on agricultural markets,think'Biofuel crops that are conducive to environmental protection are unlikely to be Mexican tortillas or pasta prices. Upreason.Another point of view is that, theBio-energy development is sure to cause a rise in the price of agricultural products,and is'Culpritculprit""hard to determine[2].

,The development of biofuels is not an important driver of rising food prices?How does it affect the food market?like effect?does cause food security issues?This becomes an important and interesting issue forthe.because the United States is the world's largest producer of biofuels,Production of fuel ethanol with corn and soybean as main raw material andBiodiesel,Therefore, this article will take the United States biofuel development as an example to explore its impact on the food market,

2. Literature Review

Theexisting conclusions on the impact of biofuel development on food markets can be grouped into three parties,that is, opponents,supporterand neutral person.

currently,The total amount of energy demand in the world is approximately year114billion ton oil equivalent,where,Oil,Coal and natural gasand other traditional sources of energy supply for the"81%,"Supply of renewable energies accounts for about13%.in renewable energy,raw materialcandominate,But traditional solid biofuels primarily,such as firewood,Charcoal and animal feces;using modern technologyToproduce liquid biofuels,mainly fuel ethanol and biodiesel,in biomass only,1.9%,This can be computed,the proportion of liquid biofuels to global energy supply is only0.25%.Even in the shipping collarfield,Annual Year liquid biofuels account for only the total fuel consumption0.9%.so,United NationsFood and Agriculture Organization (FAO),HealthThedevelopment of physical fuels for energy security is limited.also,Some scholars think,development of biofuelsNew demand for agricultural products,changes in the basic supply and demand patterns of agricultural products,The is thus contributing to the price of agricultural products in recent yearsThe important factor of the increase is1,and causing the'compete with people,with grain contentionA problem with the occurs[^5].so,againstThe point of view of theis that biofuels are not good for mitigating energy problems,but pushing up food prices again.but biologyfuel proponents thinkthat,All farmers in the world have the ability to produce food and fuel at the same time,Bio Fuel developmentwithhas potential space for development,and Abletoato a degree mitigate energy pressures in the world[0].They also providesomeevidence①,such as the USDA statistics show,American Corn for ethanol consumption7700million-ton,Occupationboundary grain consumption not enough4,This paltry corn consumption,notenough to drive food prices;Additional,2008Year8Month to2009year4between months,U.S. ethanol production did not decrease significantly,instead of keeping it stable,But during this periodWorld grain prices fall rapidly,So they think that the change in food prices is largely unrelated to biofuels.tothis,Opponents of biofuels have disproved,Although the United States fuel ethanol consumption of corn accounted for only the world's cereal consumption of the4,But data show that world grain consumption has increased7400million-ton,and the corn consumed by American fuel ethanol is increasedby3700million-ton,that is, the increase in ethanol consumption in the United States accounts for half of the world's total cereal consumption.,and

① This part of the evidence for biofuels opponents and the rebuttal from supporters comes from Patrick•Westhoffood price who determines,:Economics of food prices》.

This is a rapidly increasing number of in a short period of time,must have an impact on food prices;The latter evidence presented to the supporters,againstThose who think,2008Year9months to2009Year4months,U.S. biofuel production remains stable,growth slows,The led to afall in cereal prices,But backward prices are still higher than the price levels of previous years[7].

surrounds this controversy,scholars have started a lot of research.Existing research on the impact of biofuels development on agricultureto be based on country,The majority of the regional level,is mostly based on a computableA predictive study of the-like equilibrium model,assumes realnow certain liquid biofuel production,forecast for farm prices,,Peasant income,trade balance,,Social Security, andHow the aspect will affect.Zhang Jinhua andShenyafang onset up a theoretical model with corn fuel ethanol as an exampletype and analysis Framework,Analysis of bio-energy in short term dynamic equilibrium,Long term dynamic equalization, and with import supplementsPossible impact of development of sources on China's food security,results show,The development of fuel ethanol has not brought food security.Substantive effects,But in the long run, there is no risk of food security..Huang and ShangusingChinese agricultureIndustry Sustainable Development decision support system(Cfflnagro),analyzing different fuel ethanol development policies may be for Chinese farmersProduct Price,Impact of overall and regional agricultural production and net output value.The model is predominantly agricultural,includes wheat,Jadem,Sugarcane,Yam,Pork, etc.Major agricultural products;divides the country into north China,Northeast,East China,Central,South China,Southwest,Northwest,Qinghai-Tibet8Area,Urban and rural consumers in each region are divided into three categories by income level;plus,model considers natural constraint constraints,interaction between production and consumption,The correlation between planting and animal husbandryDepartment,and the interaction between different products in the agricultural sector,Thealso takes into account trade shipments between zones and within regionscost of transmission.results show,fuel ethanol development to increase agricultural prices,promote agricultural development and increase farmers ' income there is a productExtremeeffects,But the impact on different farmers in different regionsvaries significantly,the size of the region benefit dependson the comparative advantage of the regions in planting energySource Crops;The increase in raw material prices for fuel ethanol production will encourage farmers to add to these products.production, andleading to lower output of some agricultural products,affects production structure across the agricultural sector;also,product Pricechanges may cause production factors such as rural labor to flow from livestock to the crop sector.Study on the fact that China produces fuel ethanol in the form of "cropproduction"products without practical feasibility,Because most of these raw materials will depend on international imports.landlords andHuang[010]Multi-country based on remediation,A general equilibrium model with a multisectoral computable,profiling Global and Mekong regions borneffects of energy development on agriculture and other industries,The results show that the development of global bioenergy will significantly increase agricultural products.price and output,and change the agricultural trade structure of the Mekong region and other parts of the world.Mekong BioenergyDevelopmenthas less impact on global agricultural prices,but significantly affect agricultural production in the country,Land use,Trade andFood Safety,The magnitude of the impact depends on the international oil price and the substitution between biofuels and petrol.SAUNDERSwait[011]measure the U.S. Renewable Fuel Standard plan with a general equilibrium model(RFS)for maize andImpact of farmers ' income,Its purpose is to study the degree of competition between grain and bioenergy production,to measure the effect of the policy on the newtheimpact of the agriculture sector.results showRFSPolicy has significant effect on corn prices,because corn is American mainFeed grainsto,thus raising the cost oflivestock,and New Zealand livestock is based on pasture,has a comparisonAdvantage,ultimately benefit from bioenergy development.

Many scholars believe that the development of bioenergy increases crop prices,increases production costs for livestock products,also learnsTheNote that by-products from the production of bioenergy can somewhat mitigate negative effects.taheripourwait[012]viceProductsDDGSandVOBPTointroduceGTAPModel,Theresult finds that

a by-product is considered,The shadow of bioenergy developmentTheeffect is different..

above is the country,Amacro-data based study at the regional level,There are also some scholars from the microscopic perspective of farmersResearch on the factors affecting the cultivation of bio-energy raw material crops,Factors affecting energy consumption behavior.for food securityconcerns,China2006Year stop food production fuel ethanol,propose to vigorously develop fuel for non-grain crops••

Ethanol.YangKun, Huang &3based on farm angle,Field survey on cassava production and utilization,takestheProbitandTobitThemodel analyzes the factors that determine whether farmers choose to plant cassava and cassava acreage, respectively.result tableMing,Current cassava is mainly used for processing starch and household feeds,with the development of cassava fuel ethanol,market demand for cassavaseek fast growth;The key factors affecting the cultivation of cassava by farmers are cultivated land and non-agricultural employment status;think cassavaThe development of fuel ethanol will lead to growing cassava acreage,even vigorously develop with cassava etcnon-foodas raw materialfuel ethanol for is also difficult to complete"not with grain".

Tosummarize,Most of the existing research in is based on_-like equilibrium model for forecasting,implements_Bio-fuel productionamount,about farm prices,farmers ' income,How the trade balance affects.however,Current general balancemodel exists_Some defects,The model focuses on the economic crop prices of major energy crop countries.,energy price orClimate-related carbon emissions,The dynamics of the development of bio-energy crops,risk and lack of uncertainty testwith;and the development of bioenergy in addition to market factors,must also be supported byall aspects of national policy,such asEnergy,transport,Environment,Agriculture,International Trade,Tax,National Security,The effectof these policies is to turn tothecomplex,hard to quantify separately,explains causal relationship.so,This article will be from the market for biofuels energy cropsOverall analysis of the impact of biofuel development on food security,from production,consumption,Price Three aspects expand centanalysis,Avoid isolating biofuels from other factors that may affect food prices.

3. Biofuel development process in the United States

TheUnited States is the world's leading exporter of agricultural products,Long-termagricultural overcapacity,Thesupply of agricultural products far exceeds the nationalMarket Requirements;at the same timewith the sustainable development of the domestic economy and the rising international oil prices,United States Governmentactively explore ways to mitigate the energy crisis.is in this context,U.S. government in??Force pushBio-energy development Strategy,_Tocreate new demand points for food products,On theother hand to achieve more energySample Development,reducing dependence on fossil fuels.

Year,us to enactEnergy Policy Act2005The Energy Law emphasizes the cleansing of biomass, such asrenewableEnergy Development,and tax incentives,subsidy incentives and other means to promote their development,The is designed to provide diversity assuranceEnergy supply Security;2007New Energy bill issued at the end of the year,that isEnergy Independence and Security Act,The Act states that,To biofuels,Wind energy,Tax reduction for renewable energy projects such as solar energy,Loan guarantees and financial support such as excellentBenefits Policy,also,The new energy bill is proposed tothe%Year,to make the amount of fuel ethanol or biofuels available each yearupto milliongallon,to2022alternative fuel for domestic gasoline fuels(such as ethanol)Blendingto reach360billion plusLun,where,to%Annual fiber ethanol is at least the total amount of ethanol in the United States3,to2022This percentage of the year will increase to44%,The raw material for ethanol is mainly corn stalks,Poplar Branch,substances such as switchgrass or wood waste.

accordingtoFAOData Statistics,~2009Year,Theproportion of U.S. corn production to the world's total output remains at40%around,is the world's largest exporter of corn,This enables the United States to produce corn-fuelled fuel ethanol with a rich naturalresource.theyear years,Fuel ethanol production in the United States reaches,billion gallon,maintain annual average of four years thereafter7%increaseLong rate,to2009year to\billion gallon.United States

and World Agricultural Outlook"",World ethanol price2008yearto1.74USD/gallon,more2007Yearly growth5,and2009yearto1.6US $/Gallon,Dropped over the previousyear8,This is partly because the world's crude oil prices are down37%,OnThe other hand, the reduction in U.S. net ethanol imports is near60%,An important reason for this is the significant increase in domestic ethanol production in the United States,This can also be seen in the United States for the world canThe important impact of the source market.

Biodiesel in the United States is mainly made from soybeans,the world's highest soybean output_.accordingtoFAOData statistics,

4. Impact of American biofuels development on food markets

is currently,fuel ethanol and biodiesel are mainly based on food crops,Two types of biofuels to the food marketaffect maximum, therefore,thestudy mainly analyzes the influence of fuel ethanol and biodiesel on grain market..inthe form of energy cropsplantLand for the first production factor,and land resources are scarce,Thereis bound to be a competition between energy crops and other crops.contention,Then the development of bioenergy will not only affect the market of energy crops.,also possible for their land resourcesA crop market with an alternative relationship within has an impact.so,The analysis of theimpact of biofuels on food markets will beincludes energy crops and crops with alternative relationships.

5. Trends in price changes for major U.S. energy crops

from Diagram2visible in,~2008years,Trends in U.S. corn prices and fuel ethanol production trend baseThis is consistent,as fuel ethanol production continues to grow,U.S. corn prices continue to grow,fromToYearTheUS $/ton up to2008Year160US $/ton,grows as highas119%.especially~2008years,fuel bAlcohol production rapid growth,from93 billion gallon tobillion gallon,increase near1.5times,same time corn price also rose1times.but2009year fuel ethanol production increase,But corn prices are down,This is because2009Year United States cornincrease in output, ontheother hand by2009year of international oil price drop causedby.

from Diagram3visible in,2001 ~2008years,The trend of U.S. soybean prices and biodiesel production is almost completeall same,especiallyyear start,U.S. bio-diesel production is booming,from2800million gallon increasetimes to2008Year6.billiongallon,soybean prices also rose,from211US $/ton rose to366US $/ton,per tonprice riseUSD.

diagram3U.S. biodiesel production and soybean price trend

Data Source:US Biodiesel production data fromEIA (http: www. eia.doe.gov/emeu/aer/txt/ptb1004.html);soybean Price(producer Price)fromFAOSTAT.

to discover,Whether it is fuel ethanol orbiodiesel,U.S. biofuel raw material crop price changes aresubject to biofuel production,The price of raw crop rises with the increase in biofuel production.of course,affectCrop price factors many,So how much of the price change is caused by biofuel development,pending furtherResearch.

6. Trends in the production of major energy crops in the United States

impact of biofuels development on energy crop production,can be grown by the area,yield two metric toembodies.

from Diagram4visible in,~2008Year,the area of corn and soybeans grown in the United States is generally alternatingChange situation:When corn planting area increases,The growing area of soybeans decreases accordingly;opposite,when corn noodlesproduct reduction,grow area of soybeans increase;This trend is in#Isquite obvious after the year.theYear years corn seed

•The•

increasedbymillion hectares,soybean planting area decreased in the same yearmillion hectares;2006Year Corn planting areaLessthanthe previous year6%,Increase soybean planting areain the same age4.7% 2007Year is the most dramatic area of plant change.year,Corn Area increased5%,""causes soy area reduction14%; 2008Year corn planting area decrease9,largeBean planting area increased again16%.Overall viewof,planting area of corn and soybeans

in~2009The year ispresented withAscending trend,This is because both crops are an important ingredient for developing bioenergy in the United States.,as biofuel production increaseslong,increase demand for raw crops,isbound to expand its production.

also,Theimpact of bio-energy development on agricultural production should also be reflected in the yield level of raw material crops.other thanexpandraw Crop acreage,Efforts to increase the yield level should be the most important way to protect raw material supply.from the diagram5tosee,~2009Year U.S. soybean yield level remains stable,The total yield of the maize is rendered ontheuptrend,especially2003Year,#year up is larger,This is mainly because the United States is developing the scale of fuel ethanolGreater,more tech inputs to improve corn planting technology.

to discover,with the rapid development of biofuels in the United States,increasing demand for raw crops,its raw materialcrop production is subject to a certain stimulus,regardless of sownarea,or the yield level is reflected in the corresponding.of course,bioThe development of the fuel source is not the only increase in the yield level_reason,But increase technology input,Improve production technology efficiency is guaranteed••

an essential requirement for energy supply to meet demand.

7. Trends in the consumption of major energy crops in the United States

Impact of Bioenergydevelopment on energy crop consumption,is mainly embodied in the consumption and consumption pattern of two sidesface.accordingtoFAOdata statistics show,~2007year,The domestic consumption of corn in the United States is increasing.,yearU.S. corn domestic consumption19.8million ton,to2007year reached22.4billion T,and imports slightly increased,but exports haven't diminished,This is mainly due to the increase in domestic output in the overall year.consumption pattern of American corn in recent yearsas shownin6shows:

diagram6U.S. corn consumption pattern

Data Source:FAOSTAT.

~2007Year,U.S. corn for rations,There is no significant change in the percentage of seeds and other uses.,and feed grains a slightdrop,fromA.24%down to""72%,Absolute number reduced243.8ton;at the same time,The proportion of corn used for processing is fromA.12%up to-[], "","", "", ""86%,Absolute number added2.2billion ton,Contact2007YearU.S. fuel ethanol production?billion-gallon,increased industrial maize is mainly used in the production of fuel ethanol.

U.S. soybeans in~2006Annualproduction growth11%,2007Large reduction inannual output,mainly because of the year cornsown area increase22.5%, toreduce soybeanAcreage14%thus yieldinga sharp reduction.Seven Year soybean imports,Export volume is more stable,Small increase in domestic consumption,its consumption patterns are asshown7shows:

2001 2002 2003 2006 2007Year

diagram7U.S. soybean consumption pattern

Data Source:FAOSTAT.

from Diagram7visible in,soybeans are used primarily in the processing industry in U.S. domestic consumption,~2006share of theyearall exceed80%,but2007A significant increase in the proportion of soybeans used for feed in the year,The scale reachesis a total.7%,for plusIndustry scaling downtoNo.7,Year U.S. fuel ethanol production increased dramatically,Large amount of corn used in processing industry as a burningraw material for ethanol

production,and Corn is America's most important feedgrains,This is where soybeans become an alternative to feed grainsMaizeproduct.Thisshowsthat,thedevelopment of bioenergy for energy crops has created a pattern of consumption.the_has a definite effect.

(two)Impact of biofuel development on other crop markets

as described earlier,The development of biofuels will not only affect energy crops,and may be needed to grow arable land with energy cropsand matching natural conditions similarto,have an alternative relationship with crop effects.corn,Soybean is the main energy crop of USA, theitsmainAlternative crop to cotton.so,This section analyzes the price of cotton,production,change trend of consumption pattern.

as the trend of American corn prices is changing,Cotton fromToafter a year, especially????Price continues after yearhigh,The trend of change isvery similar to that of American fuel ethanol production..,year cotton price116US $/ton,to2007year up to179USD/ton,and2008year soared to246US $/ton,Fornine years,Priceupto112% (See figure8).forreasons,Cotton prices continue to rise because of cotton sowing in recent yearsarea decreasing,output suppressed(See figure9).Total,year after,Cotton Acreage by558.6million-hectare reductionuntil2009year311.2million-ha,(+) (a) ($) ($)resulting in a significant decline in output, however, therequirements are not reduced.

after year,The cotton area is grown by558.6million-hectare reduction to2009year311.2million ha,where2008reaches the lowest point in the year only306.3million ha,Reduced crop size causes a significant decline in production,However, cotton demand does not reduce the reverseadd,annual consumption in the United States is582.5million-ton,to2007added year78.56million ton,combine cotton eliminationfee pattern data can be found,U.S. domestic demand growth comes mainly from feed grains,Simultaneous export volume increasing every year,ultimately leads to tightconditions,making cotton prices keep higher.

through the above analysis,Itis not difficult to find the development of biofuels to the U.S. cotton price,Production,consumption and pattern generatedImportant effect.with the expansion of U.S. fuel ethanol production,More and more corn is consumed in the processing industry,to meetIncreasing demand for corn,cotton,The acreage of crops such as soybeans is reduced for planting corn.,thus cotton,Largeproduction of crops such as beans is suppressed;other,as corn Energy properties continue to increase and prices rise,with corn asAnimal husbandry costs for primary feeds,Producers are seeking alternative crops such as cotton, which are relatively inexpensive, to replace them as fodder.becausethis,Supply reduction,increased demand eventually led to higher cotton prices

8. Conclusion

Biofuels bring energy to the agricultural sector,This burgeoning industry has led to a dramatic increase in demand for agricultural products,Short-termEnergy crop prices,simultaneous because of corn,soybeans are also the primary feedgrains,The rise in their prices will also result in livestockrising cost of livestock.driven by benefits,_aspect,farmers will adjust planting structure,Increase the price of crops speciesPlant area,Constrained by limited land resources,The acreage of other crops may be reduced;on theother hand,with abilitysource crops for feed farmers or large aquaculture companies will seek a relatively inexpensive feed instead of corn,Soy,thismay also lead to an increase in the price of alternative crops.and in thelongrun,price of various crops should be convergent,becauseof theto guide price signals,farmers will constantly adjust crop structure.

also,for unmet agricultural needs,countries can import through imports in the context of national food securityInsufficient supply for domestic,and many countries around the world have lots of unused land,If you can take advantageofThe part of this land resource,will effectively increase the supply of agricultural products.at the same time,current second-generation bioenergy with cellulose and other materialsSource in active development,Although not yet able to form the scale of commercial development,But it's the future of bioenergy development.to.So overall it looks like,thedevelopment of bioenergy will have a certain impact on the price of agricultural products in the short term., but in thelong runcome,does not cause the price of agricultural products to be abnormally high,raises food security issues.

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