



UNITED STATES MANUFACTURING COUNCIL

April 29, 2014

The Honorable Penny Pritzker
Secretary of Commerce
U.S. Department of Commerce
Washington, D.C. 20230

Dear Madam Secretary:

As reported by the Alliance to Save Energy in its presentation to the House Committee on Ways and Means in 2013, *“Manufacturing is vital to American economic well-being, accounting for over 11% of GDP, 60% of exports, and directly employing nearly 12 million with above average wages and benefits. The sector consumes 26 quadrillion Btu or about 27% of national energy use.”*

In order for small and large U.S manufacturing firms to remain competitive in global markets, a sound energy strategy is critical. A thoughtful U.S. energy policy must include a strategy to use the abundance of U.S. shale gas in the most effective way possible, which is currently a matter of considerable debate.

Over several months, the Energy subcommittee evaluated various energy issues which impact U.S. manufacturers with a specific focus on issues that are not being adequately addressed or need more focused attention today. The subcommittee considered both the scale and regionality of manufacturers, with the goal of identifying policy issues that would have appreciable impact on the competitiveness of the manufacturing sector.

The members of the Manufacturing Council (Council) have prioritized the landscape of energy policy and believe that now is the time to aggressively pursue specific recommendations regarding the abundance of American natural gas.

Policymakers, natural resource producers and industry all acknowledge that natural gas is an important resource for manufacturing in America. It is used not only as an energy source to fuel power plants but also as a raw material feedstock for the petrochemical industry. According to the U.S. Energy Information Agency, industrial uses of natural gas represent more than a third of the U.S. gas demand. It is an essential raw material in the manufacture of many products including chemicals, plastics, and pharmaceuticals. Further, the recent geopolitical unrest

between Western nations and Russia, principally focused on the Ukrainian governmental framework and sovereignty, has highlighted natural gas' foundational economic value to developed nations' economic prosperity. The Council's focus on the economics of America's natural gas, especially in light of current debated foreign policy decisions to subsidize Western Europe's natural gas needs from America's supply, is especially timely to ensure that policies fully consider natural gas' impact on the continued health of our domestic manufacturing sector.

Depending on the type of manufacturing activity, energy costs are the second, third or fourth largest direct cost element in making a product. As a result of recent shale gas discoveries, average electricity costs for most manufacturing operations over the last six years have declined, and remain steady at 5-10 cents/kWh. In contrast, electricity costs in Europe have increased over that same period to 12-25 cents/kWh. Thus, the United States' new access to abundant and affordable energy will continue to improve our global manufacturing competitiveness.

Natural gas was an abundant resource from the 1960s through the 1980s and helped to support energy intensive industries such as steel and aluminum with globally competitive power prices (see Appendix B). During this time, the petrochemical industry grew significantly and provided jobs and exports for the nation. In the early 1990s, the supply-demand balances for natural gas became challenged due to coal power plant conversions and limited drilling. This led to an inadequate supply which drove prices upward and introduced significant volatility. Many energy intensive industries atrophied and the petrochemical industry had little new investment for almost 20 years (ACC (2013) Shale Gas, Competitiveness, and New Industry Investment). Abundant natural gas, through the innovation of hydraulic fracturing, has created a shift that represents a great competitive advantage for American industry, provided adequate quantities are available to support planned investments and the cost of natural gas remains stable and globally competitive.

Abundance in natural gas also has ramifications for natural resource producers. Unknown supply and demand dynamics and policy implications can also dampen investment in upstream development, transmission pipeline and export infrastructure. The data on natural gas supply and demand are clear. High and volatile natural gas prices have a negative impact on domestic manufacturing, translating into fewer jobs while a lower comparative natural gas price is a competitive advantage that translates into more exports, greater domestic investment and significant jobs growth. The data also show the importance of understanding the export of liquefied natural gas (LNG) from our borders and the impact this can have on improving our trade balance with other nations and reducing the national debt, as well as the potential impact on manufacturing wages and the return on capital of all industries.

The Council therefore recommends that the Department of Commerce lead a study evaluating the implications of natural gas exports on jobs and economic growth.

A comprehensive study on supply and demand dynamics of shale gas is being proposed to update the assumptions and models used in two existing studies on which current energy policy

decisions are being made. The NERA study (*Montgomery & Tuladhar (2013) Macroeconomic Impacts of LNG Exports from the United States*) and a study commissioned by the API and conducted by ICF International (*ICF (2013) LNG Exports: Impacts on Energy Markets and the Economy*) are generally considered to be the best available analyses on the impact of shale gas export on the American economy. Both studies, however, were conducted some time ago, and in some cases do not reflect the rapidly changing LNG landscape we find in the U.S. today. As such, caution should be exercised when using these studies to inform critical decisions that impact U.S. energy policy.

The objective of the proposed study is to generate the information needed to make relevant and timely decisions on matters such as export approvals of LNG, approval of infrastructure projects related to natural gas delivery, and regulations on production technology. The goal of the study should be to provide a framework for future policy focused on the optimization of all stakeholders, producers, domestic consumers and exports, guided by principles of scarcity theory, minimizing volatility, assuring adequate supply to domestic users, and maximized domestic economic impact and employment.

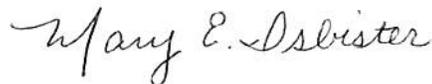
Appendix A contains a comprehensive study rationale and outline for the proposed new study on the dynamic environment of shale gas supply and demand.

We believe that the Department of Commerce is best positioned to define and lead a study focused on the economics, export/import implications and impact on employment, with input from the Department of Energy. The Council recommends that the study include input from manufacturers of all sizes, oil and gas producers, consumers and other stakeholders. We believe it is critical that this study be undertaken as quickly as possible and be completed in no more than nine months with updates provided to the Council at three and six months. We appreciate your commitment to work together to implement these recommendations so that we can meet the needs of a strong and vital manufacturing sector through informed decisions regarding America's abundant natural gas resources.

Sincerely,



Mike Laszkiewicz
Chair, Manufacturing Council



Mary Isbister
Vice-Chair, Manufacturing Council

APPENDIX A: Shale Gas Study Recommendation

Summary of Recommendation

The subcommittee recognizes that, in a rapidly changing economic system, the inputs and other assumptions required for modeling also change over time. We recommend that the most current assumptions be used for the new study, and that the study is concluded within nine months of the adoption of the formal recommendation to reflect the urgency and importance of the shale gas opportunity. This information will be a necessary factor in a number of pending decisions regarding the supply and demand of domestic natural gas and its related infrastructure.

Objective

The objective of the study is to generate the information needed to make relevant and timely decisions on matters such as export approvals of LNG, approval of infrastructure projects related to natural gas delivery, and regulations on production technology.

Rationale

A comprehensive study on supply and demand dynamics of shale gas is being proposed to update the assumptions and models used in two existing studies on which current energy policy decisions are being made. The NERA study (*Montgomery & Tuladhar (2013) Macroeconomic Impacts of LNG Exports from the United States*) and a study commissioned by the API and conducted by ICF International (*ICF (2013) LNG Exports: Impacts on Energy Markets and the Economy*) are generally considered to be the best available analyses on the impact of shale gas export on the American economy. Both studies, however, were conducted some time ago, and in some cases do not reflect the rapidly changing LNG landscape we find in the U.S. today. As such, caution should be exercised when using these studies to inform critical decisions that impact nearly every facet of the U.S. economy.

The NERA study's conclusions are striking in that they explicitly note that the expansion of LNG exports has two major effects on income: "it raises energy costs and, in the process, depresses both real wages and the return on capital in all other industries". While the findings are important, the study is limited in its ability to assess the current macroeconomic impact of LNG. When reviewing the study through the lens of today's LNG dynamics, the report's conclusions are limited by its top-down modeling approach, outdated assumptions and data, and the absence of a robust peer review. Authors did not fully appreciate the potential for price volatility and increased prices, impacts of tighter regulations, and important regional and sectoral job losses and gains. Importantly, the report does not address the gross harm and benefits that could result from higher LNG exports, which is a critical input to the public interest determination that is required for approval. Specific limitations of the study include:

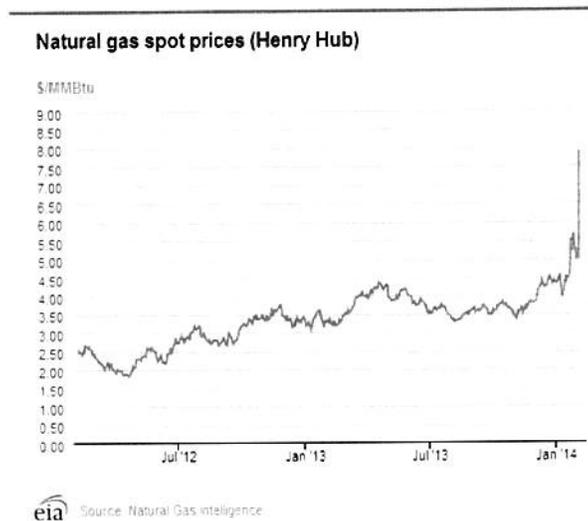
- Incomplete analysis of how underinvestment in domestic distribution infrastructure will impact gas price increases and price volatility, and result in general economic harm which might only be exacerbated by unfettered LNG exports.
- The model for demand uses two-year old data that does not account for announced investment projects by energy-intensive industries, and does not consider regional demand curves and full coal to gas energy conversion needs. The report relies on a simple selection of demand elasticities.
- The model for supply does not consider important regulatory actions and permitting delays that could hinder expansion in shale gas development or delivery.
- The NERA model represents the industrial sector as an average of five sectors, which may mute the effects of exports on critical, high-employment subsectors.
- The NERA study does not fully represent the importance of manufacturing to the U.S. economy and does not address the potential harm that would result when LNG exports undermine the global competitiveness of the manufacturing sector. It does not address the value-add of manufactured goods versus the once-through value of natural gas when burned or exported, and does not account for the loss of new, planned investments (exceeding \$110B and 5 million estimated jobs).
- The report does not address the impacts of the role of foreign investment in the expansion of natural gas export infrastructure.
- The report does not offer details on the regional and sectoral analysis of important factors such as employment levels, employment and household income, welfare, GDP, investment, consumption, output and GHG emissions.
- The Department did not apply a rigorous peer review of a report that has had a significant impact on policy decisions.

According to an independent review the 2013 API/ICF study by Charles River Associates, the API/ICF study is also of limited use in today's LNG environment, and this review highlighted five areas which may render this study less than optimal:

- The supply curve is at least twice as optimistic as MIT's median and EIA's reference cases.
- Of the 39.2 Bcf/d planned international projects, 26.5 are unlikely to be built (shelved or de-rated).
- The model uses a single supply curve to project a decline in LNG prices. This is not representative of changing dynamics over time, many of the projects used as inputs to the model are unlikely to be built, and it attempts to bolster the supply curve to by linking it to \$95bbl pol through 2035, when current prices are \$106bbl and real annual inflation has averaged 6% over the last 25 years.

- Forecasted demand is understated due to historical precedent during periods of low prices, current regulatory activity and the market penetration potential for Natural Gas Vehicles (NGV's).
- The assumption that LNG exports will increase Natural Gas Liquids (NGL's) is not substantiated.

To further illustrate the concern with the NERA and API/ICF studies we can simply review recent events. The spot price (Henry Hub) for natural gas has hit its highest level since 2010. This spike was attributed to increased winter demand. In fact, the average Henry Hub spot price is up \$4.44/MMBtu since the beginning of November 2013. Additionally regional prices constrained by infrastructure have reached prices greater than \$20/MMBtu. The effect of this *minor* perturbation on natural gas prices far exceeded the worst case price increase of either the NERA or the API/ICF studies. History has clearly shown the volatility of natural gas prices due to supply imbalances which could be exacerbated with additional demand due to exportation of LNG and delays in infrastructure development.



Therefore, a comprehensive study on supply and demand dynamics of shale gas is being proposed to correct the limitations of two existing studies on which current energy policy decisions are being made. The new, peer-reviewed study should reflect updated assumptions and data, and be viewed realistically given the history of natural gas price volatility. A well-conducted new study will fully evaluate the broad, cumulative effect that exports may have on the U.S. economy.

Key Questions

The study will address the economic impacts of natural gas and shale exploration in job creation and GDP growth, in particular the following questions:

Job Creation – Nationally & Regionally

- What is the full impact of shale gas export on domestic jobs, including manufacturing jobs, oil and gas production jobs and the multiplier effect to other employment sectors?
- To what degree do factors such as current infrastructure, regulatory activity, projected demand and projected supply impact the job creation forecast, and to what degree does exportation exacerbate these effects?
- What is the forecasted optimal balance of Capacity Investment & Export Level approved to maximize job creation.

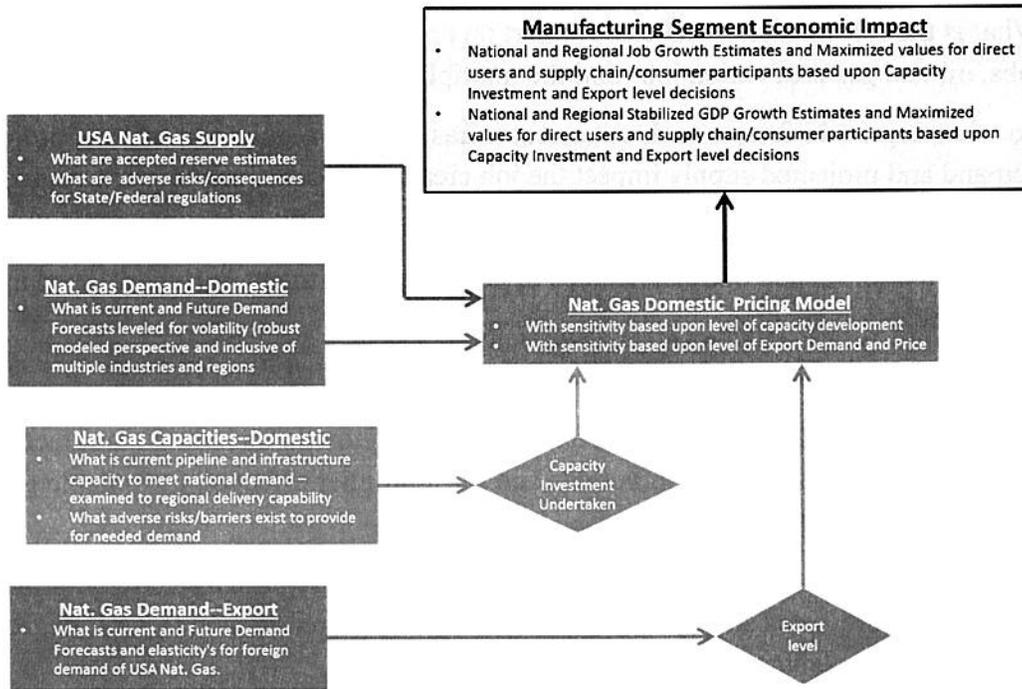
GDP Growth – Nationally & Regionally

- What is the full impact of shale gas export on GDP Growth, including manufacturing outputs, oil and gas production outputs and the multiplier effect of attributable growth in other indirect sectors?
- To what degree do factors such as current infrastructure, regulatory activity, projected demand and projected supply impact the GDP growth forecast, and to what degree does exportation exacerbate these effects?
- What is the forecasted optimal balance of Capacity Investment & Export Level approved to maximize GDP growth.

Political Analysis

- What is the overall economic impact of price volatility on the manufacturing sector, and economy as a whole with a newly created dependence on natural gas?
- Address the possibility that regulatory action at the state or federal level may hinder expansion of natural gas production using hydraulic fracturing, or that hinders the expansion of infrastructure to enable delivery (i.e. permitting for new pipelines).
- Include a full analysis of the impact of existing versus ideal delivery infrastructure, taking into consideration the existing demand and the projected future demand. Study the regional effects of infrastructure on pricing and demand.

Study Framework



Supply

- Accurately estimate available reserves to be accessed.
 - Identify generally accepted reserve quantum.
 - Identify and risk-adjust for State / Federal regulations impacting supply.

Demand – Regionally & Nationally

- Accurately estimate domestic need in order to ensure that the domestic supply remains sufficient to meet that demand without introducing price volatility.
 - Manufacturing demand with announced new builds in Gulf Coast and other regions
 - Future domestic demand by energy intensive industries.
 - Conversion from coal to gas for electricity production.
 - Non-manufacturing uses and industries.
- Accurately model the full demand picture.
 - Correct for structural factors like long-term “take or pay” practices or oil-indexed contracts.
 - Improve the modeling for demand elasticity as it varies outside the U.S.
 - Address the predictable spike in natural gas prices as a result of lifting export constraints.
 - Include pinch-points in delivery infrastructure at peak demand periods.

Capabilities – Regionally & Nationally

- Include a full analysis of the impact of existing versus ideal delivery infrastructure, taking into consideration existing and future demand and return on investment parameters.
- Develop recommended infrastructure development needs estimate such that domestic natural gas pricing at regional levels provides economic impact advantage vs. foreign derived advantage using USA natural gas feedstock.

Pricing Estimate Determination – Regionally & Nationally

- Given the dynamic supply and demand factors above, determine the effect on domestic gas prices, including:
 - Current Supply.
 - Current and future domestic demand.
 - How LNG exports impact the price.
 - Amount of infrastructure distribution capacity undertaken.

- Impact of seasonal demand and supply pitch-points on sustainable pricing and price volatility.

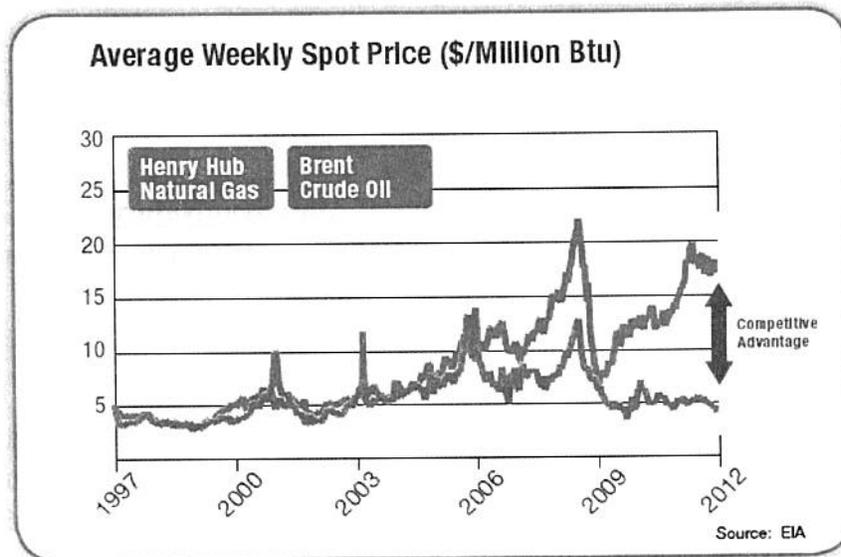
APPENDIX B: Progress Report from the Manufacturing Council Subcommittee on Energy Policy to the Department of Commerce

(Dated November 2013)

**Progress Report on New and Emerging Impacts of Abundant Natural Gas
Submitted by the Shale Gas Subteam of the Manufacturing Energy Policy Subcommittee**

Background

Natural gas is an important resource for manufacturing in America. It is used not only as an energy source to fuel power plants but also as a raw material feedstock for the petrochemical industry. It is an essential raw material in the manufacture of many products including chemicals, plastics, and pharmaceuticals. Natural gas was an abundant resource from the 1960's through the 1980's and helped to support energy intensive industries such as steel and aluminum with globally competitive power prices – their key cost component. With the cost advantage of natural gas to oil at this time, it also provided the feedstock source for the petrochemical industry which grew significantly and provided jobs and export for the nation. In the early 1990's, the supply-demand balances for natural gas became challenged due to coal power plant conversions and limited drilling. This led to an inadequate supply which drove prices to be high and volatile. Many energy intensive industries atrophied and the petrochemical industry had little new investment for almost 20 years. As one important example, in 1991 over 95% of the ammonia-based fertilizer used in US agriculture, which is manufactured from natural gas, was made in the US. By 2004, less than 40% was domestically produced, creating an unfortunate coupling between US energy import volatility and domestic food production. Abundant natural gas through the innovation of hydraulic fracturing has created a shift that represents a great competitive advantage for American industry, that is if the natural gas is available for the >\$100B of announced investment and the cost of natural gas remains stable and globally competitive.

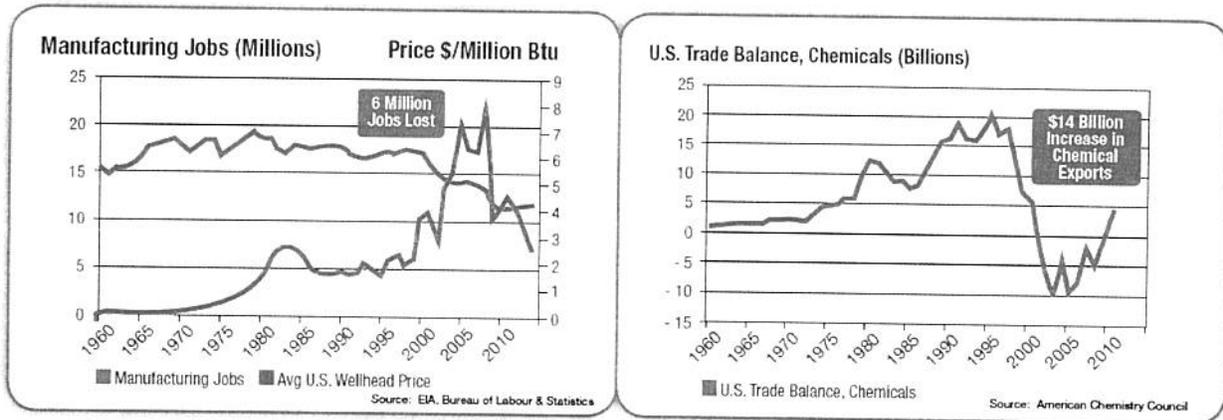


Work Summary

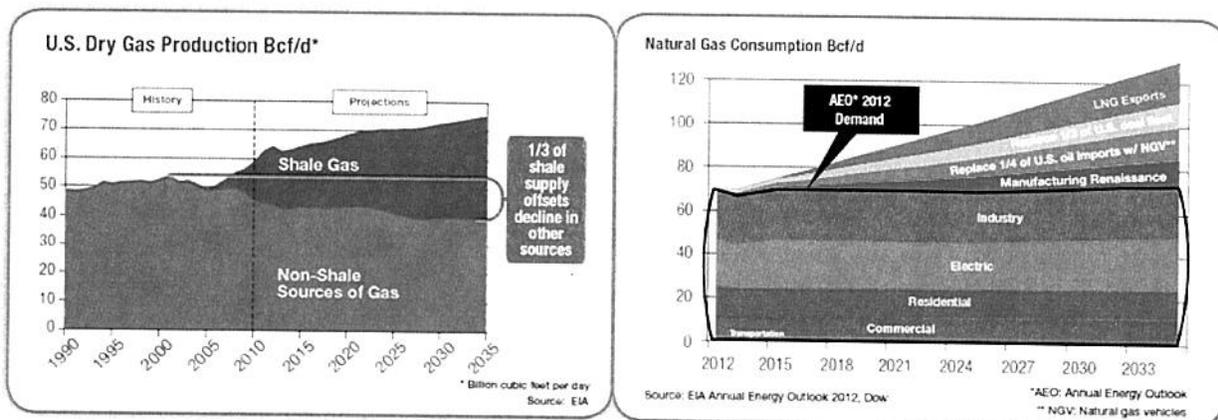
The shale gas subteam was able to gather a significant amount of energy data that was readily available through the U.S. Energy Information Administration (EIA). Information was also gathered through other organizations which have published natural gas data and information such as the American Coalition for Clean Coal Electricity (ACCCE) and the American Chemistry Council (ACC). The U.S. Department of Energy (DOE) has also provided relevant information on the U.S. natural gas Import/Export process.

Relevant data discovered was prepared for review in subteam meetings. The team discussed the importance of the data and how it further shaped our understanding of the key issues. Examples of key conclusions that the data supported:

- i. High and volatile natural gas prices has a negative impact on domestic manufacturing and translates into fewer jobs
- ii. Lower natural gas price compared to the oil equivalent energy value is a competitive advantage that translates into more exports (trade surplus), greater domestic investment and significant jobs growth.



The data also shows the importance of understanding the impact of the additional natural gas demand that will be created by the export of liquefied natural gas (LNG) from our borders.



The Department of Energy commissioned NERA Economic Consulting to study the potential macroeconomic impact of LNG exports. Although specific projections from the study can be debated, there are a few broad conclusions that should be considered.

- i. Net economic benefits highlighted in report are shown to be concentrated in the Oil and Gas industry sectors. All other sectors of the economy would, according to the report, lose.
- ii. The report concludes that expansion of LNG exports has two major effects: It raises energy costs and in the process depresses both real wages and the return on capital of all other industries.

