

Commentary on
“The Rise of Off-Shoring: It’s Not Wine or Cloth Anymore,”
by Gene Grossman and Esteban Rossi-Hansberg

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It is a pleasure to participate in this 25th Jackson Hole Symposium. I recall the first symposium in 1982. Much has changed since then, and the “new geography” was one of the reasons. Today, for the first time in 25 years, the Kansas City Fed gave everyone a beautiful backpack. It’s embroidered with the Teton Mountains and “Jackson Hole Symposium” in script, and on the label you see “Made in China.” It’s a wonderful example of the gains from U.S.-Chinese trade which was just beginning in 1982.

It is also a pleasure to read and discuss Gene Grossman’s and Esteban Rossi-Hansberg’s paper. They begin by assembling several data series to show the growing importance of “task trade,” or off-shoring, for the U. S. economy. Unfortunately few data sets exist on off-shoring, so, while highly suggestive, all the evidence is indirect. Hence, the first policy implication that I draw from this paper is the urgent need to collect off-shoring data, whether by central banks or government statistical agencies.

The most fascinating part of the paper, in my view, is the authors’ new model of task trade. They call it a new paradigm; that’s pretty bold, but I think they are right. Their model implies that off-shoring raises productivity. This point has been made previously, and it is well known that such productivity increases ultimately raise wages in the U.S. economy as a whole, though sometimes after a period of adjustment and reallocation of workers to different jobs.

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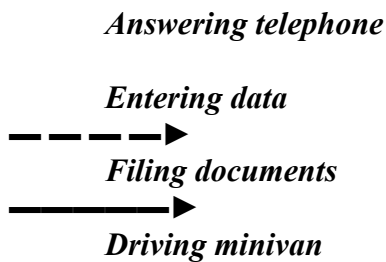
But the Grossman-Rossi Hansberg (GRH) model yields a much stronger result, namely, that off-shoring increases the demand for workers whose tasks are off-shored, and thus increases the wages of these workers. More specifically and assuming that foreign wages and prices are exogenous as an approximation, if tasks done by low skilled workers are off-shored, then the wages of these workers rise with no adverse employment effects. If tasks done by high skilled workers are off-shored, then the wages of these workers rise with no adverse employment effects. This is a strong and counterintuitive finding. In my view, it requires some pretty strong assumptions that may be difficult to test, as I will show below.

Translating the Math into Simple Examples

I agree with the authors that we need to modernize Adam Smith's example of the pin factory to reflect the modern world of off-shoring. In fact, I think such real world examples are sorely needed to fully flesh out, test, and assess alternative models of off-shoring. The GRH model assumes a very particular functional form for technical change in off-shoring. In their model off-shoring innovations reduce the cost of off-shoring every task performed by workers in a skill-class by the same proportional amount. Mathematically, they assume a proportional shift factor (β) which changes the cost of off-shoring $\beta t(i)$ for every task i . A lower β , for example, lowers off-shoring costs for every task. An alternative, more general formulation, would be assume a functional form such as $\beta(i)t(i)$ in which the shift factor $\beta(i)$ is different for each task i . To illustrate the importance of these technology assumptions, let me work in terms of a very simple

example; it's not exactly a pin factory, but it helps to assess the plausibility of this or alternative models.

Suppose that the tasks performed by lower-skilled workers in the GRH model are as follows:



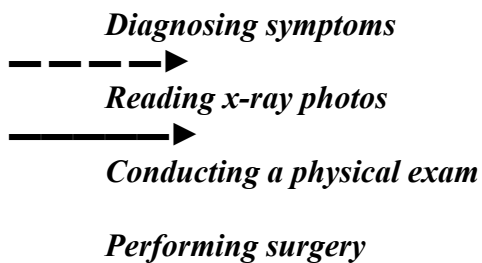
These tasks are the “i’s” in the theoretical model, and I have listed the tasks in order of increasing difficulty of off-shoring, just as $\beta t(i)$ is an increasing function of i in the GRH theoretical model. (It is worth noting that when I looked at occupation manuals for low skilled workers in order to create this example, I found very few low-skilled tasks that can be off-shored. Most low-skilled work—gardening, bartending, office cleaning—cannot be off-shored.

I have drawn arrows on the list to represent the costs of off-shoring the different tasks. Tasks above a particular arrow are off-shored. Tasks below that same arrow are not off shored because the cost of off-shoring is too high and more than offset the lower wage abroad. A shift from the dashed arrow to the solid arrow represents an off-shoring innovation (a lower β in the model).

Suppose the initial situation is represented by the dashed arrow. Now suppose that an off-shoring innovation shifts the dashed arrow down to the solid arrow. Perhaps a new high speed scanning device is developed to get vast numbers of paper forms into the computers for filing through the internet. With this change, the firms will begin to off-

shore “filing.” Now, in the GRH model, this innovation also reduces the costs of low skilled tasks that are already off-shored (answering telephone, entering data). This is the essential infra-marginal assumption about innovation in the GRH model. After the innovation, profits rise, causing the firms to expand and increasing demand for low skilled workers (now all driving minivans). Hence, the wage of low skilled workers rises at home. If the costs of performing currently off-shored tasks did not decline, then there would be no increase in the demand for the low-skilled workers at home. Hence, the example illustrates the importance of the infra-marginal impacts of off-shoring innovations.

A similar example shows the impact on wages when tasks performed by higher-skilled workers are off-shored. Now suppose that the tasks performed by higher-skilled workers (say, medical doctors) are



Again the tasks are ranked in order of increasing difficulty of off-shoring. In this example the off-shoring innovation (a lower beta in the model) shifts the threshold from the dashed arrow to the solid arrow. Analogous to the previous example, the demand and the wage of high skilled workers (now all conducting physicals or performing surgery) rises.

The Special Assumption about Improved Off-shoring Technology

As the examples illustrate, the assumption that innovation affects all off-shored tasks seems very special, yet it is essential for the strong wage results. An improvement in scanning technology, for example, does not reduce the cost of off-shoring telephone answering services. It does not seem to generate the needed infra-marginal effects. Grossman and Rossi-Hansberg essentially assume that all innovations are like the internet, which does reduce the cost of all off-shored activity.

In my view, testing the validity of the model will require a systematic study of the nature of off-shoring innovations, with the aim of testing whether off-shoring cost shifts occur as the authors assume in their functional forms or whether an alternative is more accurate.

The Tests Based on Wage-Productivity Residuals

I appreciate the authors' attempt to test the model using aggregate data. Their approach is to calculate total factor productivity in the United States, adjust it for relative price changes, and then compare it with actual real wage growth. They find that actual low-skilled wage growth is higher than this adjusted productivity growth in recent years. In other words there is a positive residual. The authors then identify the residual with the productivity effects due to off-shoring developed in their model. To be sure, Grossman and Rossi-Hansberg are cautious about their test and the interpretation. Nevertheless, there are a host of alternative explanations for such a residual, including productivity effects due to innovations that raise productivity of low-skill workers at home. So without

more information, it is questionable to assume that the residual is due to any one explanation in particular. Clearly more empirical work is needed here.

Benefits to People in Low Income Countries

One of the benefits of off-shoring is completely ignored in the paper: the benefit to the people in poor countries who get the off-shored jobs. In fact, in my view too much of the work on off-shoring is focused on the benefits and costs to people in the developed countries, while the development effects can be even more dramatic. I would like to see more on this part of the off-shoring issue in the paper.

While I was at the U.S. Treasury I made a bunch of visits to poor countries in Africa and made a point of praising off-shoring as a new channel of economic development through the private sector. I recall an impressive off-shoring operation in Accra, Ghana. The American company, Affiliated Computer Services (ACS), had established a facility to process automobile insurance claims for car accidents in the United States. Thousands of jobs were created by this operation and the African workers were paid well above the average wage in Ghana and were upgrading their computer and language skills at the same time. I made a point of telling such stories of economic development in my speeches, until the political controversy started over off-shoring in the Annual Report of the President prepared by the Council of Economic Advisers.

In inviting me to discuss the GRH paper, Tom Hoenig suggested the possibility of my drawing broader policy implications, and in particular implications for monetary policy. While the GRH paper is a real trade model that abstracts from inflation and other nominal variables, I think there are two possible implications for monetary policy.

Longer and More Variable Lags From Productivity to Wages

The GRH model suggests a very complex dynamic process through which productivity increases affect wages. In conventional economic theories, a technological innovation that reduces costs and thereby productivity, first leads to an increase in profits and then an increase in wages as competition among firms drives economic profits to zero. This dynamic process is difficult to model and this is one reason why wage dynamics are so difficult to model. But it is important for monetary policy to understand whether wage increases are due to productivity or whether they are going to lead to an increase in the growth of unit labor costs, which could be inflationary.

The GRH model indicates that process can be even more complex and spread out over time. The lags between an off-shoring technology shift and wage increases can be very long. Complicating the transition is the fact that the workers who are getting wage increases are not the ones that experienced a reduction in the costs of performing tasks. In fact, taken literally, the cost of producing tasks (driving minivans) in the United States does not decrease at all in the GRH model, so the wage increases might seem inflationary if the off-shoring effects are not taken into account. The model may provide part of the answer why wages have lagged behind productivity for a longer time in the last few years than in earlier periods.

Staggered Wage Setting Goes Global?

A second implication for monetary policy is that the new paradigm creates a new channel for monetary interaction between countries. In the large empirical multi-country monetary models (with rational expectations) developed for policy evaluation in the early

1980s—at Stanford, the Fed, the IMF, Brookings and other places—there were many channels of interaction between countries. In fact, the models were a little ahead of their time, with strong globalization assumptions such as perfect capital mobility, which linked interest rates in different countries, or pass-through channels, which linked prices in different countries. But one link was not part of these models and is still not part of the successor policy evaluation models: the direct link between wages in different countries. The GRH model has an equation which makes such a link very specific: the wage in one country is equal to a constant times the wage in the other country. That is, $w = w^* \beta t(I)$. Thus the “prevailing wage” that is relevant when firms are deciding on what value of w to set actually includes the foreign wage w^* adjusted for the cost of off-shoring. This wage-wage channel greatly complicates the models of wage determination and inflation dynamics. While off-shoring is probably not pervasive enough for this to be a substantial inflation link at this time, its growth is so rapid that it is not too early to start taking it into account in multi-country models that are used for policy evaluation.

Conclusion

While my remarks have been critical of certain aspects of the Grossman and Rossi-Hansberg paper—the special nature of the technology assumptions, the empirical testing methods, the lack of attention to the developing countries, let me conclude on a much more positive note. I believe that this paper does set a new paradigm. By showing explicitly that off-shoring raises wages and is comparable to labor augmenting technical change, it goes a long way to creating a framework for a more analytical and rational discussion of this complex phenomenon. To the extent that the assumptions do prove to

be too strong or special when tested empirically, they can be modified in future work while at the same time preserving many of the important features of the model.