

Commentary: The Rise of Offshoring: It's Not Wine for Cloth Anymore

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It is a pleasure to read and discuss Gene Grossman and Esteban Rossi-Hansberg's paper. They begin by assembling several data series to show the growing importance of "task trade," or offshoring, for the U. S. economy. Unfortunately, few data sets exist on offshoring, 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 offshoring 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 offshoring 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.

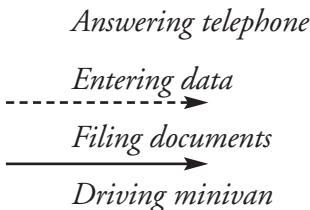
But the Grossman/Rossi-Hansberg (GRH) model yields a much stronger result, namely that offshoring increases the demand for workers whose tasks are offshored and, thus, increases the wages of these workers. More specifically and assuming that foreign wages and prices are exogenous as an approximation, if tasks done by low-skilled workers are offshored, then the wages of these workers rise with no

adverse employment effects. If tasks done by high-skilled workers are offshored, then the wages of these workers rise with no adverse employment effects. This is a strong and counterintuitive finding. In my view, it requires 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 offshoring. In fact, I think such real-world examples are sorely needed to fully flesh out, test, and assess alternative models of offshoring. The GRH model assumes a particular functional form for technical change in offshoring. In their model, offshoring innovations reduce the cost of offshoring 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 offshoring $\beta t(i)$ for every task i . A lower β , for example, reduces offshoring costs for every task. An alternative, more general formulation would be to 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 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:



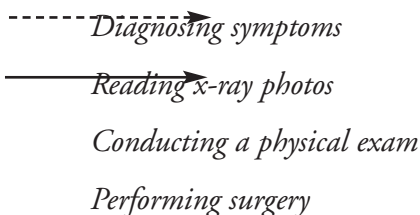
These tasks are the i 's in the theoretical model. I have listed the tasks in order of increasing difficulty of offshoring, just as $\beta t(i)$ is an increasing function of i in the GRH theoretical model. (It is worth

noting that when I looked at occupation manuals for low-skilled workers in order to create this example, I found very few low-skill tasks that can be offshored.) Most low-skill work—gardening, bartending, office cleaning—cannot be offshored.

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

Suppose the initial situation is represented by the dashed arrow. Now, suppose that an offshoring 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 computers for filing through the Internet. With this change, the firms will begin to offshore “filing.” Now, in the GRH model, this innovation also reduces the costs of low-skill tasks that are already offshored (for example, answering telephone, entering data). This is the essential inframarginal 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 offshored tasks did not decline, then there would be no increase in the demand for low-skilled workers at home. Hence, the example illustrates the importance of the inframarginal impacts of offshoring innovations.

A similar example shows the impact on wages when tasks performed by higher-skilled workers are offshored. 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 offshoring.

In this example, the offshoring 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 offshoring technology

As the examples illustrate, the assumption that innovation affects all offshored 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 offshoring telephone answering services. It does not seem to generate the needed inframarginal effects. Grossman and Rossi-Hansberg essentially assume that all innovations are like the Internet, which does reduce the cost of all offshored activity.

In my view, testing the validity of the model will require a systematic study of the nature of offshoring innovations, with the aim of testing whether offshoring 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-skill 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 because of offshoring 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 because of innovations that raise productivity of low-skilled 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 offshoring is completely ignored in the paper: the benefit to the people in poor countries who get the offshored jobs. In fact, in my view, too much of the work on offshoring 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 offshoring issue in the paper.

While I was at the U.S. Treasury, I made several visits to poor countries in Africa and made a point of praising offshoring as a new channel of economic development through the private sector. I recall an impressive offshoring operation in Accra, Ghana. Affiliated Computer Services, an American company, had established a facility to process insurance claims for automobile 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 offshoring in the *Annual Report of the President* prepared by the Council of Economic Advisers.

In inviting me to discuss the Grossman and Rossi-Hansberg paper, Federal Reserve Bank of Kansas City President Tom Hoenig suggested the possibility of my drawing broader policy implications, and, in particular, implications for monetary policy. While the 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 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. 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 offshoring technology shift and wage increases can be 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 (for example, driving minivans) in the United States does not decrease at all in the GRH model. So, the wage increases might seem inflationary if the offshoring effects are not taken into account. The model may provide part of the answer for 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 multicountry monetary models (with rational expectations) developed for policy evaluation in the early 1980s—at Stanford University, the Federal Reserve, the International Monetary Fund, The Brookings Institution, 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 that 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 offshoring. This wage-wage channel greatly complicates the models of wage determination and inflation dynamics. While

offshoring 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 multicountry 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 offshoring 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.