

To answer the question that panel asks: I firmly believe that there is an important ethical component to structural transformation, as there is with any human activity. The ethical and social ramifications of structural transformation vary considerably across countries. Newly developing countries are dealing with the decline of agriculture and the growth of industry and services, while the advanced economies are dealing with the subsequent decline of manufacturing and the emergence of service economies. I want to touch on three aspects of these transformations: (1) the dominant causes of structural transformation, a topic on which I have some expertise, (2) the ethics of protectionism, a common policy response, and (3) key challenges for the future which need to be discussed and addressed.

Figure 1 is reproduced from a recent paper of mine with Francisco Buera (Buera and Kaboski, 2012a). It shows the fraction of GDP that is produced in the agricultural sector vs. the level of average real income per capita for a panel of countries. Each dot represents a particular country in a particular decade over the past 150 years. We have a representative set of countries, covering rich and poor countries, big and small countries, and every continent, and the data we have constitute roughly 80 percent of the global economy.

The shape is well-known, a declining share of agriculture converging to a negligible share of the economy. There are two classic explanations for this or any structural change. The first is a demand explanation, Engel's Law, which essentially states that food is a necessity good, and so as incomes increase people spend less and less of share of your income on food. This is even truer for agricultural goods, the raw materials that go into food. The second is a supply explanation that states that agricultural productivity grows faster than the rest of the economy, driving the relative price of agricultural goods while at the same time reducing the number of workers needed in agriculture.

Here the dominant explanation appears to come from demand. What is striking is the consistency of this relationship across very different countries at very different points in time. For example, with the "Green Revolution", hybrid seeds, genetic engineering, etc. of the past 40 years, agricultural productivity growth has been rapid, but it was not particularly fast in the late 19th century U.S. when agriculture declined. It also occurs with remarkable consistency in regimes with little trade (the interwar years, for example) as well as in the recent decades of globalization. It appears to be primarily driven by the changing demand patterns that accompany rising incomes. We should expect it to occur wherever and whenever incomes rise out of hard poverty, occurring most dramatically as per capita incomes rise to about \$3500/year, roughly that of China in 2000.

While the the decline in agriculture accompanies a good thing, the lifting of countries out of material destitution, however, its decline and the subsequent growth of manufacturing and, to a lesser extent, services has dramatic social consequences on societies. Many of the advanced economies experienced these in the 19th and early 20th centuries. The agrarian lifestyle, which had dominated the past 12,000 years of human history, essentially disappeared. This was

accompanied by massive rural to urban migration. Yet, this migration didn't equalize incomes across sectors, and agricultural workers still lagged far behind urban workers in their incomes. Still, cities exploded in size, and, while large cities had a lot to offer, they brought with them all the problems of urban concentration, including pollution, traffic, inadequate housing, etc. A great deal of social capital was lost, as people left close-knit communities to move to anonymous cities. The family experienced dramatic changes as well. Women, who always actively worked on farms, became specialized in the household economy. The sizes of families shrank also as less family labor was needed.

How did Western societies respond to this social upheaval? It was at this point in the arts, that Romanticism and a yearning for the pastoral emerged. In the U.S., the Boy Scouts developed targeted toward getting people out of cities and back to nature. Social institutions emerged as a substitute for the lost sense of community and an antidote to the irony of urban isolation. Free masonry and civic societies grew rapidly, as did labor unions.

Churches also played a big role, particularly in the U.S., where urban parishes became communities within a community. Catholics started the Knights of Columbus, which offered insurance to the families of factory workers in the event of their death, a role that local communities had played in rural life. Protestant groups started the YMCA (Young Men's Christian Associations) to make sure that young migrants to the city would have a safe, wholesome place to stay and not be seduced by the decadent moral life of the cities. The churches also played a similar role for international in migrants.

In many places, both churches and governments also called for support for the rural areas, for those who were left on the farm, those whose incomes were actually lower and living in the places where communities were disappearing? Agricultural extensions developed to increase farming productivity in the hopes of boosting their income. Schools, colleges, and roads were built in rural areas to try and ensure that rural people had equal opportunities.

Indeed, these policies were largely well-intended. Pope John XXIII, for example, whose family had been sharecroppers, recommends these policies to support the agricultural and rural sectors in his encyclical *Mater et Magistra*. The decline in agriculture occurred nonetheless, however, and indeed some of these policies, those that led to faster productivity growth in agriculture, may have more than ineffectual; they likely have hastened the movement out of agriculture, following the supply side explanation I described.

Much later, after most of the decline in agriculture and a great deal of the growth in urbanization had already occurred, governments instituted protectionist measures. These policies included agriculture price support, tariffs and quotas on agricultural imports, government purchase programs, etc. Many of these policies continue today. While ostensibly benefitting the family farm, they largely serve the interest of large-scale agri-business, which has heavy lobbying power.

I have spent so much time discussing the historic decline of agriculture for two reasons.

First, this isn't just history. Developing countries that are growing rapidly are experiencing these same phenomena right now, only at a much more rapid rate. Over the sixty years from 1820 and 1880, the share of agriculture in the U.K. dropped from roughly 25 percent to 10 percent. Thailand, a country twice as big, experienced this same journey between 1980 and 1993, just 13 years! Many of the aforementioned agricultural subsidies of the advanced economies, by driving down the price of agricultural goods, only exacerbate the social upheaval. While cheaper food prices that result outside of Europe, Japan, and the U.S. are good news to the urban poor in Bangkok or Mexico City, they are devastating to the incomes of farmers in the poorest regions of Thailand and Mexico.

Second, there are some parallels between the decline of agriculture and the decline of manufacturing. These patterns are shown in Figure 2, with the upper panel showing the rise and fall of industry (manufacturing, mining, and construction) and the lower panel showing the rise and acceleration of services as incomes rise. Again, you see the consistency of the relationship across very different countries at very different points in time. Again, the patterns are closely linked to rising incomes. In the U.S., the relative decline of the industrial sector, and the corresponding growth in services, has been occurring for over 50 years. Fewer than one in ten workers in the U.S. is in manufacturing proper (i.e., excluding construction and mining). In another 50 years, I expect this graph for industry to look similar to the one for agriculture. Note, however, from the larger human perspective, it would be the end of a sector that played a prominent role in the economy for a relatively short period of time, and almost never constituted more than half of the economy.

Again, there are the same two classical explanations. The supply side explanation posits that productivity growth in manufacturing exceeds services. Baumol's famous example of slow productivity growth in services: after 200 years, it still takes four people to play a Beethoven string quartet. It is a witty comment, but it is also misleading. We can now translate that performance into an .mp3 file that millions of users can download into their I-Pod at the press of a button. Indeed, much of the supposed slow growth in services is an artifact of poor measurement.

My co-author and I, in another recent paper (Buera and Kaboski, 2012b) examined the growth of the service economy in the U.S. in great detail. Our results surprised many people.

First, although politicians from all sides point to international trade as a culprit, it does not explain the growth of services or decline in manufacturing. Instead, the growth in the U.S. production of services is accounted for by the growth in the consumption of services in the U.S. Thus, like agriculture, the decline of manufacturing and growth of services is explained by shifting demand patterns as incomes rise. In that sense, it is likely to be as ubiquitous as the decline in agriculture and as robust to policy intervention.

Second, the growth of the service economy is not a story of McJobs. It is dominated by high-skill industries like health, education, finance, law, and professional services as shown in Figure 3. Low-skill services have actually declined as a fraction of the economy. Figure 4, taken from some current research in progress, shows that these patterns are not specific to just the U.S., but they hold across almost all of the advanced economies. The high skill services increase over time, while the low-skill services are stagnant. We again think this is a story of the changing composition of demand, toward skill-intensive goods and services.

This changing demand has vast implications for society, some promising and some more challenging or even troubling. First, there is a tight link between the service sector, the home sector, and female labor force participation. Women tend to be relatively more productive in services than in manufacturing, construction or mining. In the U.S., where the service sector has grown the most, it has been mirrored by an increase in female labor force participation. The population overall spends more time working in the market but less time working at home. The re-emergence of high rates of female labor force participation has direct effects on family life, but it may have broader implications. One important example: as the wages of women rise, it may lead to even lower rates of marriage and fertility.

Second, higher demand for skill-intensive output increases the relative wage of skilled workers, e.g., college-educated workers. Thus, the rise in services and corresponding decline of manufacturing can lead to higher social inequality, and wage inequality has risen for over four decades in the U.S. This is naturally of great concern. We don't know how large a role the service economy is playing, but to the extent it is playing a role, the trend is likely to continue.

Finally, in my research, we show that there is a big difference between the average scale of service and manufacturing establishments. The advent and adoption of large-scale manufacturing technologies played a role in urbanization during the Industrial Revolution. In many places, the closure of manufacturing establishments has again devastated some communities.

Despite the difference in scale across sectors, we also show that the fastest growing industries in the U.S. are not only skill-intensive, but also quite large-scale. Some of these services are quite tradable (e.g., finance, accounting, or other professional services). Those services where labor can be easily traded again have the potential of transforming how we do work. Telecommuting is becoming more and more common, allowing some working women and men to more easily combine careers with raising families, and this may become more prevalent in the future. But what will then replace the common workplace as a center point for friendships and the building of community, and how will this effect or work relationships? What role will the Church play in all of this?

Many large-scale services are less tradable, linking the place of consumption with the place of production (e.g., universities, hospitals, live sports). Cities are again being transformed, from

places where urbanites take advantage of returns to scale in production, to places where urbanites take advantage of returns to scale in consumption. In U.S. cities, families have become less common.

Finally, what is an appropriate and ethical policy response? As I mentioned with agriculture, I don't view protectionism as an appropriate response. I worry that this will lead to similar consequences, where protectionism does little to stem the tide but leads only to increased special interest politics and harms the newly industrialized countries. Fears of off-shoring can lead to policies protecting U.S. jobs, but these would come at a great cost to consumers and an even higher cost to the Chinese working poor.

One of the two biggest concerns is assisting those most harmed by structural transformation, the farmers and urban migrants in the case of the decline of agriculture, and the factory workers and urban working class in the case of the decline of manufacturing. Perhaps one-time insurance payments can be made to older workers who lose, while educational opportunities and potentially subsidies to outmigration might be offered to younger people. All of these require taxes, which are difficult to raise, however. The other major problem is not the presence of winners and losers, but the overall growth in inequality. It is not known how much of this can be overcome simply by higher levels of education. I worry that people with less innate ability may simply find it harder to compete. This is exacerbated by the skill-bias of technological change, which is probably a larger issue than structural change. There is certainly much to discuss on the policy side.