A NOTE ON RAPID ECONOMIC DEVELOPMENT

ROBERT M. FEARN*
North Carolina State University, Raleigh, NC, USA

Abstract
This note specifies the microeconomic conditions that give rise to special periods of economic enhancement: rapid growth and wide-spreading prosperity. Several distinctly different historical examples are examined. The analysis may prove to be helpful to transitionalizing nations that are seeking new sources of economic growth.

JEL Classification: L11, O12, P23

Keywords: Economic Growth, Economic Structure, Transitional Economies

1. Introduction

Spree: 1. A frolic. 2. A drunken carousal (Webster's, 1956)
Spree: n 1. A lively frolic; boisterous time. 2. A prolonged bout of drinking, a drunken carousal… (origin uncertain) (Barnhart, C. L., Edr., 1967)
Spree: n (origin unknown): an unrestrained indulgence in or outburst of an activity < went on a buying _____; esp. BINGE, CAROUSAL (Merriam-Webster's, 1994)

This work examines an aspect of economic growth that has received limited attention in the voluminous development literature; namely periods of extremely rapid growth and wide-spreading prosperity. Although special periods of rapid economic enhancement (SPREEs, for short) have occurred from time to time, these growth spurts have often been considered as isolated or unique economic episodes rather than as integral parts of economic development amenable to our usual tools of ana-

lysis. Joseph Schumpeter's work, of course, is a notable exception to that general-ization. Hence, this note has a Schumpeterian flavor although it cannot hope to match the grand dynamics of Schumpeter's work. Rather, it attempts to make explicit the micro conditions necessary for SPREEs and, thus, to identify the commonalities between such seemingly diverse experiences as the SPREE in China upon the intro-duction of the family responsibility system, the technologically-induced SPREE in the US during the 1990s, and others. In that way, many, if not all, SPREEs may be seen as variants of a common economic experience and incorporated into the well-accepted theoretical framework of economic analysis.[2]

The starting point for this analysis is the recognition that massive and widespread improvements in real income flows cannot occur in a market economy unless BOTH producers and consumers reap substantial benefits in a relatively short period of time. Hence, SPREEs involve income enhancements that (1) substantially exceed the familiar benefits from trade or exchange and (2) are self-limiting in their nature. As Schumpeter and others have argued, some of these growth spurts have their origins in technological breakthroughs and/or in the discovery of new resources. (Schumpeter, 1934, 1939, and Spar, 2001). It is not enough, however, to assume that new technology and/or new resources will inevitably give rise to extraordinary periods of growth. An appropriate analysis must explain the economic conditions under which such forces will be transmitted through the system and how those same forces will bring the SPREE to an end.

That, of course, was Schumpeter's aim in his work on the role of entrepreneurs and the root causes of business cycles (Schumpeter, 1935). For example, he noted:

"The fundamental question still remains unanswered. Why should the carry-ing into effect of innovation (as distinct from inventions...) cluster at certain times and not be distributed in so continuous a way as to be capable of being just as continuously absorbed as the current increase in the supply of labor is? One answer suggests itself immediately: as soon as the various kinds of social resistance to something that is fundamentally new and untried has been overcome, it is much easier not to do the same thing again, but to do similar things in different directions, so that a first success will always pro-duce a cluster (See, e.g., the emergence of the motor-car industry)".

"This is indeed the method of competitive capitalism which has not yet died out in trustified capitalism; to spread an improvement and reap the social harvest in the succeeding depression".

---

2. This analysis does not consider the forced-draft industrialization and growth under planned or directed economies such as that in the Soviet Union under Stalin or Germany under Hitler. An operating, but not "perfect," market economy is assumed.

This note suggests a different answer to the "fundamental question" raised by Schumpeter. It starts by asking: "What does it take for an outward shift in the production possibility frontier to generate a growth period of monumental proportions"? One answer, of course, is that the shift must be sizeable relative to the possibilities that were previously available to the society. As suggested above, however, that is not enough. Any potential cost reductions can have very widespread benefits only under particular demand conditions; namely, when the new product(s) experiencing potential cost reductions has (have) a product elasticity (elasticities) of demand exceeding 1.0 (in absolute magnitude). Only then will there exist the potential for a SPREE as all (or almost all) producers reap substantial benefits and as customers eagerly increase their purchases disproportionately in response to price reductions.

2. Luxury Goods?

Consider the familiar equation for the elasticity of demand:

$$\eta_{xpx} = \eta^*_{xpx} - \alpha_x \eta_{xI}$$

where η^*_{xpx} is the income compensated price elasticity of demand for product x, α_x is the share of household(s) expenditure on product x; i.e., XPx/I , and η_{xI} is the income elasticity of product demand. It is conceivable that η^*_{xpx}, by itself, exceeds 1.0. In such an instance, α_x and η_{xI} simply add to the magnitude of the market elasticity (assuming that α_x is >0 and that x is a superior good). In other and perhaps most instances, η^*_{xpx} may be less than one. In such cases, η_{xpx} will exceed 1.0 only if $|\alpha_x \eta_{xI}|$ raises it to that level. Obviously, that could occur with a large α_x, a positive and large income elasticity, or both. However it happens, whenever η_{xpx} exceeds 1.0 for products experiencing sizeable potential or actual cost reductions, the stage is set for a SPREE.[3]

---

3. Dave Flath points out that whenever a technological innovation or other cost saving lowers the marginal cost of a (new) product below the intersection of the demand curve with the price axis, the price-quantity relationship is apt to be in the elastic portion of the demand curve for that product (or those products). Hence, for a SPREE to occur, potential (or actual) buyers must represent a substantial portion of the affected population. And that is where income elasticities of demand may play different roles at different times and places; giving rise to SPREEs at vastly different levels of mean (or median) income across nations and economies. Of course, the distribution of income may play a key role in whether there are "enough" potential or actual consumers in the affected income categories. More about that later.

Clearly growth spurts may be relatively infrequent; given the periodicity of techno-logical innovations, discovery of new resources, etc. Moreover, those breakthroughs may not jibe with consumer demands. Since compensated demand elasticities can often be expected to be less than one and since α_x's for many products may be small, highly elastic product demand seems most likely if the relevant income elasticity is positive and large (a superior or ultra-superior good). It is in that sense that the products in question are apt to be "luxuries". Note, however, that what is a "luxury" at one level of real income (or economic development) can be a normal or even an inferior good at a higher level.

3. Change Over Time

As the market for the new (and/or improved) product(s) expand(s) in the "win-win" manner noted above and as real incomes rise, it is highly likely (perhaps inevitable) that η_{xI} will fall; lowering the uncompensated (ordinary) elasticity of demand into the normal range of 0 to 1 and bringing the SPREE to an end. That development, of course, can be expected to stimulate a shakeout (or at least a consolidation) of firms in the producing industry or industries.

These simple analytics immediately suggest several testable hypotheses. The first is the shakeout hypothesis itself; an hypothesis that is seemingly supported by anec-dotal evidence, but which begs for further tests concerning matters such as timing and the linkage of the shakeout to demand elasticities. A second hypothesis is found in the possibility that a rising α_x (for new products) might offset a falling η_{xI} for some time, thereby postponing the shakeout or consolidation.[4] A third hypothesis is that technological change itself could become institutionalized and generate new pro-ducts in serial form (a la Schumpeter's scenario); postponing the shakeout. A final hypothesis stems from David Flath's comment above; namely that the magnitude and extent of any SPREE may depend crucially on the income level and/or income distribution of the affected society or economy; what might be called a "large group effect" or a "middle class effect." Note, finally, that nothing in this explanation of SPREEs conflicts with monetary economics or represents a theory of business cy-cles a la Schumpeter or anyone else.

4. Historical Examples

As suggested above, there are multiple candidates in economic history for the title of SPREEs, but econometric tests are scarce. Obviously, at the level of the individual

---

4. Note that $d\alpha_x/dI$ is greater or less than 0 as η_{xI} is greater or less than 1 with P_x constant.

firm in a largely competitive market, each producer faces a highly elastic demand curve. The key to identifying SPREEs or products leading to SPREEs, therefore, is the elasticity of industry or product demand curves. Several historical examples follow:

   A. A Schultzian (or Chinese) Example.
In his masterful work, Transforming Traditional Agriculture, Theodore Schultz (1954,1983) cited the emergence of an agricultural surplus as a necessary precondition for economic development. Assuming η_{xI} for many, if not all, agricultural products to be near 1.0 and that α_x is large in less developed countries, it is conceivable that $|\alpha_x\eta_{xI}|$ could be large enough to make $\eta_{xpx} > 1.0$ for foodstuffs in such economies. Clearly, α_x and η_{xI} for foodstuffs in developing nations are much closer to 1.0 than is the case in developed (richer) nations or economies.

   Consider now what happened in China when the communes were abandoned and the family responsibility system was installed. First, of course, the operative production possibility frontier shifted out (on the agricultural products axis). Almost immediately, there were substantial increases in the incomes of many, perhaps most, farm families. Moreover, the real and money price of foodstuffs fell in the cities (Johnson, D. G., 1994). Finally, there was no immediate or massive flow of labor or other resources out of agriculture in the short run. That apparently came somewhat later.[5]

   This particular interpretation of events in China may be controversial. Justin Yifu Lin *et al.*, (1966) Samuel P. S. Ho, (1994) among others have emphasized and calculated the flow of Chinese labor from agriculture into rural nonagricultural pursuits (township and village enterprises) following the successes of the household responsibility system. Moreover, they highlight the very rapid growth of *per capita* annual incomes in rural areas (an annual real growth rate of 8.25 percent from 1978 to 1994). Lin *et al.* also note that "consumption of all major food items in China in-

---

5. In reviewing an early version of this paper, Arthur Coutu noted that a similar phenomenon occurred when agricultural reforms were instituted in South Korea in the years following the Korean conflict. To the consternation of FAO and other international agencies, there was little or no redundant labor flow out of agriculture in the short run. Although the available evidence of that phenomenon is patchy and complicated by numerous micro and macro policy shifts, price controls, and changes in land tenure, it seems clear that there were substantial increases in food production and considerable movement from "low income" to "high income" crops with no or only a slow decrease in the farm (and rural) population until the late 1960's and early 1970's. See George E. Rossmiller, Ed., (1978) especially pp. 96, 124, 133, and 175 and Bong Kyun Suh, (1971), pp. 72, 80, and 144.

creased rapidly"; doubling or quadrupling, in some cases. (Lin, J. Y. *et al.*, 1966, pp. 172-4). Grain, of course, was the exception. Thus, while neither Lin *et al.* or Ho examine the initial elasticity of demand for foodstuffs, their evidence could be consistent with the analysis developed here. The key issue, of course, is when and how the flow of "redundant labor" began.

Some scholars assert that "farmers must adjust to the (rural) transformation by leaving the agricultural sector and finding employment in other sectors"; a statement consistent both with price elasticities of demand for farm products less than 1.0 at all times and the scenario of high and then lower elasticities suggested here (Zhang, X. and Li, G., 2003). Others seemingly argue that the new system made rural labor redundant from the outset of the new system as one might expect if the demand elasticity of foodstuffs was always less than one. (Ho, 1994).

By contrast, Lin Wenyao et al. (1990) argue that the short run flow that did occur was not a flow of redundant labor in the usual sense of that expression. Rather, they suggest it was related to the investments by nouveau riche farmers in sewing machines, welding torches, and other capital goods; a direct function of their increased wealth. Some of these new ventures involved daily or weekly commutes to railheads to ply their new trades or sell the new goods. On the farms, they were often replaced in part by other family workers or by hired workers, but the scenario outlined by Lin Wenyao and his colleagues is a far cry from the kind of "redundant labor" expected by scholars familiar with the low elasticities of demand for foodstuffs in the developed world.

To summarize, no one doubts that there was a considerable growth in rural non-farm employment over the period. According to Johnson, non-farm employment constituted about 22 percent of the rural labor force by 1983. (1994). It is the timing and nature of that movement and its relationship to demand elasticities that are at question.

Continuing with the implications of changing elasticities, one could argue that to the degree Chinese farmers were free to alter their output mix toward agricultural products with higher income elasticities, one would expect market forces to guide farmers in those directions – also postponing or limiting the shakeout. Hence, one might expect greater population flows from those areas where possibilities for crop alterations were limited. Causal evidence seems to support that presumption. (See Yang, 1966, and Fearn, 1966).

Nevertheless, any SPREE based on agriculture can be expected to be limited as real incomes rise in both rural and urban communities and as α_x's and η_{xI}'s fall; particularly for standard products like breadstuffs and other grain-related products. Hence, increased farm-to-non-farm migration (and even rural-to-urban migration

where permitted) can be expected to have produced either unemployment and/or increased employment in China's burgeoning export sector as the agricultural SPREE faded into history. (Benjamin, D. et. al., 2000). Production for export is considered below.

B. Schumpeterian (or Technological) Examples

As Bill Gates and other "nerds" know implicitly, if not explicitly, η_{xpx} can be very large because the income compensated elasticity of demand is large and/or because η_{xI} is large - even when α_x is quite small. Indeed, in developed countries, η_{xI} and η_{xpx} appear to have been sizeable (in absolute magnitudes) during the 1990's for products in the computing, biotechnology, and other "high-tech" industries. In addition, the SPREE generated via these products may have been extended by substantial economies of scale and/or external economies. Finally, the cost savings produced by any self-generating technological advances (as suggested by Schumpeter) would help to maintain the SPREE and delay the shakeout.

While this high technology example may seem uniquely modern, Phyllis Deane's seminal work on the industrial revolution (1979) found precisely the same patterns in agriculture and, particularly, in the expansion of the English cotton textile industry in the 1700-1800's. Moreover, Deane explicitly cited the role played by high demand elasticities in the cotton textile SPREE (my terminology, not hers). Indeed, it would appear that textiles (and especially cotton textiles) were superior or ultra-superior goods; given the level(s) of real income per capita in England and some of the colonies at that time. In an important sense, therefore, this note is also "Deaneian" in its nature.

Similarly, one suspects that the SPREE in automobile production in the U.S. fits the same pattern; a new technology (mass production) coupled with high demand and income elasticities for "luxury" goods.

In addition, we find myriad examples in Debora Spar's recent book, Ruling the Waves. (2001) In that fine work, Spar examines numerous major historical changes that generated "cycles of discovery, chaos, and wealth". Those changes include the development of the following:

    a. the compass and navigational skills,
    b. the telegraph,
    c. radio,
    d. satellite television,
    e. encryption and the internet,
    f. computer software operating systems, and
    g. the digitalization of music.

Spar argues in each instance that the new technologies passed through four (4) phases; labeled: "innovation", "commercialization", "creative anarchy", and finally, "rules". Throughout, she concentrates on the details of the new developments, the objectives of the innovators versus the commercializers, the competitive struggle among participants, various institutional and legal changes, and the like. She does not, however, incorporate income or demand elasticities into her "cycles". Nor does she examine how such factors may play a role in "commercialization", in "creative anarchy", or in the demand of the embattled and/or surviving competitors for rules and regulations. Nevertheless, the patterns seen in her last three phases are consistent with the analysis developed here. Innovators dance to different drummers; a point recognized by both Schumpeter and Spar.

Finally, a very informative and detailed article by Couper *et al.* (2003) discussed in considerable depth the recent "boom and bust" in telecommunications; concentrating on the technological and regulatory environment. Hopefully, the "further analysis" they call for will include evidence on income and price elasticities together with an examination of what might be termed the depth of the market.

C. Raw Material Based SPREEs

SPREEs resulting from new discoveries of or lower cost raw materials are more complicated phenomena than those discussed above, but they appear to have some of the same general characteristics. Given that raw materials are usually intermediate goods rather than being directly consumed, one might expect the impact of greater availabilities of a raw material to depend upon factors such as (a) the raw material intensity of various products and (b) the elasticity of substitution among inputs. Although the impact of final product demand elasticities might be muted, they should still play a role as product lines with lower elasticities yield resources to products with higher elasticities, *ceteris paribus*. Alternatively stated and demonstrated by Hicks, the elasticity of factor demand is positively related to the elasticity of product demand, among other influences. Hence, the shift in output shares would move in the same direction as it does in the Schultzian and Schumpeterian examples noted above. Hendrik Wilm Lanbers (1981) discusses one such case, the discovery of large sources of natural gas in the Netherlands, noting that "in a few years, natural gas had gained an important share in industrial use and household consumption". He also found that the government, which obtained a considerable share of the income from domestic sales and exports, chose to expand massively the social security program in the apparent expectation that these income flows would be permanent. There appears to have been no notion that the SPREE could or would set in motion forces that would bring it to an end.

With the notable exception of Lanber's interesting work, there seems to be little concern in the literature with raw material based SPREEs. There can be no doubt that this topic warrants considerably more attention.

5. Export-led Economic Growth

At first sight, the successes of various nations in export-led economic growth might appear to fit our analysis of SPREEs. Certainly, all the "Little Dragons" as well as the big one have experienced phenomenal growth spurts in recent years. Export-led spurts, however, are better analyzed as resulting from the opening of markets and the realignment of trading patterns and production locations. In short, the economic gains result not from technological or other outward shifts in production possibility curves, but from opportunities for trading partners to exploit their respective comparative advantages. Even though individual producers or small nations see high price elasticities from their necessarily limited perspectives, the major benefits need not depend either upon shifts in production possibility curves or upon product price elasticities that are >1.0. Nor is the game a "win-win" proposition since there are sizeable disemployment and retraining costs; the extent of which is usually in dispute. Suffice it to say that export-led growth spurts appear to be a different economic genre from the SPREEs examined here. At this juncture, it's foolhardy to ask which form of growth is the more important.

6. Further Implications

Even at the level of generality employed in this note, the analysis of SPREEs provides several interesting and testable implications concerning changes in prices, output and industry composition over time. The following three graphs follow from the analysis above:
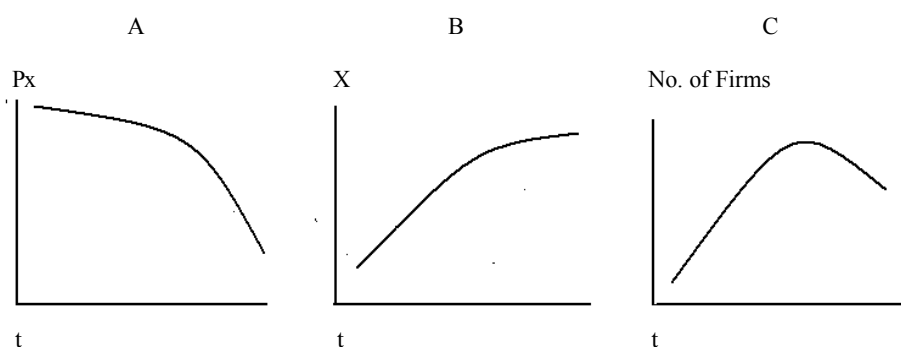
Clearly graph "C" is more conjectural than either "A" or "B". Industrial composition after a SPREE is likely to depend heavily on specific technologies, legal and institutional constraints, patent and copyright protection and the like.[6]

Regardless of any current limitations, the analysis of SPREEs seems strong enough to warrant more detailed attempts to quantify how η_{xpx}, η_{xI}, α_x, P_x, X, and industrial composition have changed over time for economic sectors that appear to have generated SPREEs. Arguably, greater knowledge of SPREEs and their relationship to real income levels and income distributions across time and across nations will help transitionalizing nations and their entrepreneurs to find major growth sectors specific to their own populations; supplementing benefits that come from export-led growth and the discovery of their own comparative advantage(s).[7] At a minimum, the analysis of SPREEs further emphasizes how crucial it is for a society to have a social climate that supports and rewards the search for new growth opportunities.

References

Barnhart, C. L., Ed., 1967, *The World Book Dictionary*, Chicago, Field Enterprise Educational Corporation, Vol. II.

Benjamin, D. et. al., 2000, "Markets, Human Capital, and Inequality Evidence from Rural China", unpublished paper.

Couper, E. A., Heikal, J. P., and Wolman, A. L., 2003, "Boom and Bust in Telecommunications". *Economic Quarterly,* Vol. 89, No. 4., 1-24.

Deane, P., 1979, *The First Industrial Revolution,* Cambridge, Cambridge University Press, Second Edition.

Fearn, R. M., 1996, "Review of Calamity and Reform in China," *Comparative Economic Studies,* Vol. 38, No. 4, 141-3.

Ho, H. P. S., 1994, *Rural China in Transition,* Oxford, Clarendon Press

---

6. In a substantial sense, the analysis of SPREEs is similar to the well-known theory of cartels. Cartel theory indicates the economic and even the political factors that are favorable to the formation of cartels. And we know from the analysis the time paths taken by prices and outputs. We also know how cartel pricing and output controls "plant the seeds" for the eventual destruction or impotency of the cartel. However, nothing in our kit bag of analytical tools helps us very much in predicting when the cartel will "fall apart" or become ineffective. And so it is with shakeout or winding down of a SPREE.

7. For several years, the author has argued that high quality, low cost, privately-owned housing in Russia (and some of the other former Republics) could be such a growth sector. Obviously, the growth potential would also depend upon expenditures for social overhead capital (roads, utilities, etc.), financial arrangements, and the relaxation of unnecessary bureaucratic restraints (including the dismissal of corrupt officials.) Clearly, Russia and many other FSU nations have no lack of entrepreneurial talent.

Johnson, D. G., 1994, "China's Rural Reform: Is Success Wanting?" *Choices,* Second Quarter, 1.

Lambers, H. W., 1981, "The Vision" in *Schumpeter's Vision: Capitalism, Socialism and Democracy after Forty Years,* edited by Arnold Heertje, New York, Praeger Publishers, 107-29.

Lin, J. Y., Cai, F. C., and Li, Z. 1966, *The China Miracle,* Hong Kong, The China University Press, a Friedman Lecture Monograph.

Lin, W., Li, J., Zhang, L., Liu, G., and Liu, S., 1990, "A Model for Urbanizing Rural Population Movements," *Chinese Journal of Population Science,* Vol. 2, No. 1, 25-33.

Merriam-Webster's Collegiate Dictionary, 1994, Springfield, MA, Merriam-Webster, Inc., Tenth Edition.

Rossmiller, George E., Ed., 1978, *Agricultural Sector Planning,* Lansing, MI, Department of Agricultural Economics, Michigan State University

Schultz, T. W., 1983 [1954], *Transforming Traditional Agriculture,* Chicago, Chicago University Press.

Schumpeter, J. A., 1934, *Theory of Economic Development,* Cambridge, Harvard University Press

Schumpeter, J. A., 1935, "The Analysis of Economic Change", *Review of Economic Statistics,* Vol. XVII, 6.

Schumpeter, J. A., 1939, *Business Cycles,* New York, McGraw Hill.

Spar, D. L., 2001, *Ruling the Waves,* New York, Harcourt, Inc.

Suh, Bong Kyun, 1971, *The Strategy for Agricultural Development of Korea,* Seoul, Samhwa Corporation.

Webster's New Collegiate Dictionary, 1956, Springfield, MA, G. and C. Merriam Co., Publishers, Second Edition.

Yang, D. L., 1996, *Calamity and Reform in China,* Stanford, Stanford University Press.

Zhang, X. and Li, Guo, 2003, "Does Guanxi Matter to Non-farm Employment", *Journal of Comparative Economics,* Vol. 31, No. 2, 315-6.