



De La Salle University

AKI

Angelo King Institute
for Economic and Business Studies

DLSU-AKI Working Paper Series
2025-08-101


**Was it All About Institutions? The Case
of Taiwan Semiconductor
Manufacturing Company and the
Fordist Movement in the United States**

By:

Andrei Lorenzo U. Catangay
Carlos L. Tiu School of Economics
De La Salle University

This paper was awarded the second prize in the 2024-2025 essay-writing competition organized by the Angelo King Institute among the students of the Carlos L. Tiu School of Economics, on "Institutions and Development."

**DLSU - Angelo King Institute
for Economic and Business Studies**

 20/F, Br. Andrew Gonzalez Hall
2401 Taft Avenue, Manila, 0922, Philippines

Visit Us

 <https://www.dlsu-aki.com/>

Was it All About Institutions? The Case of Taiwan Semiconductor Manufacturing

Company and the Fordist Movement in the United States

Andrei Lorenzo U. Catangay

Introduction

Pasinetti's (1993) book, "A Structural Economic Dynamics: A Theory of the Economic Consequences of Human Learning", delves into his emphasis on technological innovation and effective demand. It argues that a capitalist economic system must bring about a proper match between the growth of technological efficiency and the growth of effective demand for an economy to develop. As such, this offers a different view for structural development. Given this, it goes against the idea of Acemoglu et al.'s paper (2001), titled "*The Colonial Origins of Comparative Development: An Empirical Investigation*" where they asserted that economic prosperity is dependent on the quality of the institutions of a country. Yet, it is much more than that, as good policies, technological advancement, and effective demand play a key role when it comes to successfully achieving structural transformation.

Furthermore, a chicken and egg dilemma will also be discussed in this paper whether Acemoglu et al.'s (2001) claim of good institutional quality must come first before economic development. Perhaps, it is more of a co-evolutionary model that was put forth by Chang (2002) and Rodrik (2007).

While institutions do play a role in development, it is not just them that cause economic prosperity. This paper will bring an argument derived from the analysis of empirical cases from

Taiwan and the United States (US), which says otherwise to AJR's claim. We will see the role of technological advancements and effective demand in structural development.

It is well established in the field of economics that firms – the entities that create jobs and provide income to households, and households – supply labor to firms, and significantly contribute to the firms' productivity and output. Therefore, given this dynamic feedback mechanism, analyzing structural development must come from these actors and institutions alone.

Theoretical Framework

The Porter's Diamond Model is a framework developed by Michael Porter in 1990 in his book "The Competitive Advantage of Nations". It is a framework for analyzing the factors that contribute to a nation's competitive advantage in specific industries. It is divided into four different components, with two other factors, which are chance and the government (Porter, 1990). Below is a brief overview of the different components of the model from an excerpt from his book.

Four Components of Porter's Diamond Model

- 1. Factor Conditions** – The nation's position in the factors of production, such as skilled labor or infrastructure, is necessary to compete in a given industry.
- 2. Demand Conditions** – The nature of domestic and/or international demand for the industry's products or services.
- 3. Related and Supporting Industries** – The presence or absence in the nation of supplier industries and other related industries that are internationally competitive.
- 4. Firm Strategy, Structure, and Rivalry** – The conditions in the nation govern how companies are created, organized, and managed, as well as the nature of domestic rivalry.

Other Factors

- a. **Government** – The role of the government in the model is described as a catalyst and a challenger to the firm’s competitive advantage (De Bruin, 2018). This is because the government can encourage and push companies to raise aspirations and move to a higher level of competitiveness when it comes to production. However, the government can also challenge these industries with regulatory burdens and laws that encapsulates them.
- b. **Chance** – Though not necessarily included in the original model, researchers include this as it is the likelihood that external events can benefit or negatively affect a country or industry (De Bruin, 2018). These events are beyond the control of the government and companies.

The Pasinetti Structural Economics Dynamic

Pasinetti’s structural economic dynamics is a framework that emphasizes the interplay between technological advancements and evolving consumption patterns. It explains that for an economy to achieve structural development, it must coordinate its production and consumption structures through technological progress, evolving demand, and/or changing consumer preferences. Moreover, Pasinetti’s assertion on effective demand co-determines the benefits reaped from technological progress – effective demand and technological progress must be in equilibrium to achieve optimal economic results.

From Halevi’s paper (1994) titled Structure and Growth: *“technical change emerges as the crucial determinant in the dynamic process outlined by Pasinetti since it contains both a demand and supply aspect”*. This quote captures an essential thought of Pasinetti, where technical change is the kickstarter of structural transformation and not institutions. Since the former drives the whole economy to evolve by restructuring both what can be produced and what can be consumed.

With all of these mentioned, the following section will be a case study of Taiwan, which will analyze its largest firm, Taiwan Semiconductor Manufacturing Company (TSMC), through Porter's Diamond. The second is more of a consumer level from the US, with Ford's *Model T* to further explore the hand-in-hand role of effective demand and technological progress in economic growth and development.

Taiwan and the US serve as a compelling example that challenges AJR's claim, as these two economies have empirically proven that development can be initiated first from the firm and the consumer side, rather than through institutional quality. Furthermore, it is a great example to prove Pasinetti's claim that technological advancement affects both supply and demand, as we will see for Taiwan, having great international effective demand, while the US for its great domestic effective demand.

Case Analysis on the Role of International Demand in Economic Development (Taiwan)

Taiwan is known for its semiconductor hub, most known for its largest company in the country – TSMC. An analysis of the financial statement of TSMC during Q4 2024 shows that it yielded a net revenue of 26.854 billion USD, representing a 67.1% market share in the digital foundry market (Taiwan Semiconductor Manufacturing Company, 2024).

Before becoming a semiconductor giant, it is important to look back on how Taiwan reached this point. To start, the Kuomintang was a political party that ruled Taiwan from 1949 to 1987. They ruled under authoritarian rule, yet they employed good policies and strategically intervened to keep Taiwan afloat. During the 1950s, the "Land to the Tiller" policy yielded a positive result for land ownership of farmers, as it doubled from 30% in 1950 to 64% in 1961 (Kim & Wang, 2024). Moreover, it also established export processing zones in 1960 to attract investors, as the

government offered tax breaks and other incentives to foreign companies. This period of Taiwan showed that even with weak institutions, yet with strategic policies, it is possible to achieve development.

The next part would be employing Porter's "National Competitive Advantage Theory", Table 1 shows its application to TSMC. A brief discussion on the build-up of the industry is as follows:

Firstly, the government had a huge role acting as a catalyst for change and structural development for Taiwan. To start, the factor conditions of human labor and infrastructure were long established, dating back to 1974, when the government decided to focus on the semiconductor industry. Afterward, 19 engineers were sent to the US for training in collaboration with Radio Corporation of America (RCA) with a specialization in the development of integrated circuits (Windham, 2003).

Furthermore, according to Zhang & Sun (2019), the 1954 implementation plan of education serves as a policy that is focused on expanding vocational and technical education. This laid the groundwork for Taiwan on its emphasis on developing the science, technology, engineering, and mathematics field in the country. In relation to this, the National Key Fields Industry-University Cooperation and Skilled Personnel Training Act was enacted in 2021. According to the Ministry of Education (2024), one of its key emphases is to foster industrial and technological talent, with a focus on further promoting the semiconductor industry.

As for the analysis on the firm itself – TSMC, its (1) firm, strategy, structure, and rivalry, (2) related and supporting industries, and (3) demand conditions. These three conditions go hand-in-hand, as TSMC has built a strong supply chain model, as a pure-play foundry model – where it

designs and fabricates advanced microchips for other companies. With this strategy in mind, it allowed TSMC to dominate in the global semiconductor market and has yielded great international effective demand for its products, especially from the US market.

Based on the documents of Taiwan Semiconductor Manufacturing Company (n.d.) The pure-play foundry model was decided in 1987, as the company did not want to compete with its customers. Therefore, enabling them to serve a wide range of global clients and build trust with them. Another reason for this firm's strategy and structure is the fact that although TSMC excelled in manufacturing, it did not have any intellectual property for a long time. These gaps are also recognized by the founder and long-time CEO of the company, Morris Chang. This further prompted the decision to pursue a pure-play foundry model for TSMC.

Lastly, chance would be on Taiwan's side as 1976 proved integral to the development of the semiconductor industry of the country. Based on Windham's paper (2003), after training the Taiwanese engineers, RCA granted a technology transfer to Taiwan's Electronics Research and Services Organization, allowing them to learn more about producing integrated circuits, and the start of developing the semiconductor industry.

To close Taiwan's case, it is important to note that although the domestic demand for Taiwan's complex goods, such as semiconductors and integrated circuits, is low. It is drastically made up for by its ever-growing role in the global value chain.

Lastly, the decision of TSMC to pursue as a pure-play foundry offers a compelling argument against AJR's claim on strong institutions and securing intellectual property rights. It can be seen from the discussion above that even with a lack thereof, it did not hinder TSMC from developing

and emerging as a world-leader in the semiconductor industry. Instead, it built itself to be a neutral and high-quality manufacturer of semiconductors.

Below is Figure 1, which shows a summary of what was discussed above.

Table 1.

Porter’s Diamond of TSMC

Porter Determinant	Taiwan
Factor Conditions	The workforce in technology is highly specialized
Demand Conditions	Demand from Taiwan is small, yet huge demand from US companies makes up for it
Related and Supporting Industries	A full supply chain model that includes design and fabrication of semiconductors
Firm, Strategy, Structure, and Rivalry	The firm’s pure-play foundry model shows its relentless focus on delivering high-quality semiconductors
Role of Government	Government interventions are strategic, created policies that develop STEM & human capital
Chance	RCA tech transfer to ERSO became a catalyst to further develop Taiwan’s semiconductor industry
The Diamond as a Whole	A robust industry that helped Taiwan leap from an agrarian economy to a semiconductor hub

Effective Demand on Economic Development – The Case of the US

The information here is obtained from Henry Ford’s (1922) book titled “My Life and Work”. In the 1900s, cars were considered a luxury, as only the wealthy could afford them, and go racing with them. However, in 1909, the arrival of the Ford *Model T* changed the landscape due to its innovative design that incorporated vanadium steel, making the car lighter and stronger compared

to ordinary steel. In its first year of production, the company received an estimated 25,000 orders, yet it only produced 17,000 units.

The Model T was perceived as affordable at the time, with 850 USD in 1909 or 27,914 USD in today's economy. That said, technological progress was made in 1913 when Henry Ford perfected the assembly line, which yielded more units produced. Given the economies of scale, in 1925, the Model T's price was cut to 260 USD or 4,636 USD in today's economy.

Without a doubt, the Ford Model T helped the United States propel its economy and develop as a nation (Eli et al., 2023). According to Lacy (2003), the Model T paved the way for the changing of consumer preferences from 1910 to 1930. Furthermore, it also contributed to the rapid rise in rural motorists during the same period, which brought development to the rural landscape. Particularly, the state of Virginia had 53,388 miles of rural roads in 1914, only 7 % of which were surfaced. This number rose to 12% in 1921 and 21% in 1930.

Fordist Movement in America

With all these mentioned, Ford's contribution can not only be seen at the micro level, where consumers' preferences are changing, and can conduct economic activity in a much more efficient manner. It also has its contribution to the macro level, where the technological progress of the assembly line back then was coined "Fordist movement". During the Fordist era from 1940 to 1970, it was estimated that manufacturing workers increased from 10,500 to 17,000 (Harris, 2020).

Furthermore, the Fordist movement in the American Midwest illustrates how structural transformation can be rooted in regional firm activity. According to a paper by Page and Walker (1991) titled "From Settlement to Fordism" – before the Fordist movement, America's Midwest's agro-industrial revolution was built upon a network of localized innovation with farm equipment,

food processing, and manufacturing. It was driven by microeconomic actors such as farmers and entrepreneurs in responding to the dynamic of demand and supply in the region. In relation to this, the Ford Motor Company in the 20th century began to integrate with the Midwest's economy and supply chain, accelerating the region's transformation to a Fordist economy. As a result, the Midwest became both a supplier and beneficiary of the Fordist movement – where it supplied labor, raw materials, and received higher wages through the employment of workers in manufacturing.

Moreover, in 1914, Henry Ford revolutionized labor-management practices by introducing a 5 USD daily wage – doubling the prevailing rate at the time. Though often seen as a generosity, a paper by Raff and Summers (1987) states otherwise, as it is an example of the efficiency wage theory. Based on the study, Henry Ford's decision was a response to declining productivity and absenteeism rates. It was mentioned in the paper that before the wage increase, the Ford Motor Company's assembly-line system was getting undermined due to a high annual turnover rate of approximately 370%. As such, the new wage rate dramatically reduced labor attrition and absenteeism rates. At the same time, improving morale and maximizing output per work, leading to an increase in firm productivity. Lastly, the wage policy also had a secondary effect of stimulating demand by raising household incomes.

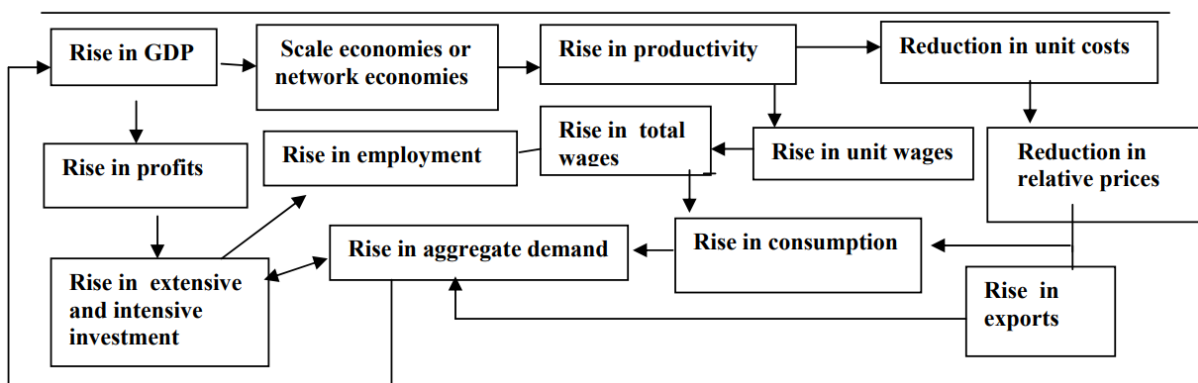
With those mentioned, Figure 1 shows the stylized representation of the Fordist model of growth in the US economy. The diagram illustrates the Fordist model of economic growth, characterized by a virtuous cycle driven by mass production, rising productivity, and expanding demand. To start, a rise in GDP enables economies of scale that lead to enhanced productivity, which in turn reduces unit costs. As such, the cost savings of firms allow them to lower relative prices, thus boosting both exports and domestic demand. At the same time, higher unit wages and

employment are possible due to the increased productivity. In turn, this leads to increased total wages and household consumption – increasing aggregate demand. In turn, it allows for more profits and incentives for firms to invest, leading to technological advancements, further stimulating employment, and GDP growth.

The diagram aligns with Pasinetti’s (1993) assertion on technological progress and effective demand. In order to harness technological advancements, a strong, effective demand is needed, whether it may be through the international market or the domestic market. This is because the lack thereof will lead to a cascade of events that can lower economic activity, hampering growth and development.

Figure 1.

A stylized representation of the Fordist model of growth in the US economy



Source: *Valli (2009)*

Was it All Institutions?

The question now remains whether the economic prosperity of economies can be explained solely by institutions?

Based on the two case analyses that were discussed, microeconomic actors, particularly firms and consumers or firms within a supply chain that have effective demand, are the true drivers of structural transformation. In Taiwan, it was TSMC and its pioneering efforts that built advanced semiconductor capabilities, allowing them to move up to the global value chain (Lee et al., 2009). As mentioned earlier, TSMC lacked intellectual property and thus decided to pursue a pure-play foundry model, which paid off in the long run.

Similarly, in the United States, the technological advancement of the assembly line that was introduced by Henry Ford led to an increase in wages and a decrease in the price of the unit for the *Model T*. Henry Ford did not only deliver a car model, rather a technological advancement at the time which is the Fordist movement. This allowed for the growth of the manufacturing industry in the US and enabled more workers to enter the industry. Creating a feedback loop of harnessing the technological advancements at the time and the role of effective demand. Having said that, it led to the development of various regions in the country, such as the Midwest, and the development of rural roads in the state of Georgia, as mentioned earlier. Furthermore, we have also discussed that Henry Ford paid the efficiency wage rate, allowing for better productivity for both the firms and the workers.

Given the question earlier, “*Does economic prosperity of economies can be explained solely by institutions?*” Acemoglu, Johnson, and Robinson asserted that inclusive institutions that are good quality are politically stable, and those that properly enforce property rights and contracts are responsible for the economic prosperity of economies today. Though these are important, it can be seen from the discussion above that it was truly the dynamic between the firms and the consumers that kick-started the development and structural transformation.

As such, this paper emphasizes the importance of technological advancements and effective demand. If it were not for the effective demand for TSMC's products, Taiwan might not have fully utilized its technological advancements, and its economy might look different today. The same thing holds for the US. If there were no demand for the *Model T* the assembly line model might have never taken off.

Chicken and Egg Dilemma

“Institutional development should not be seen as a precondition for economic development, but as something that develops through the process of development”. – (Chang, 2002, p. 113).

The debate over whether institutions lead economic development or whether development forces the evolution of institutions greatly mirrors the famous chicken-and-egg dilemma. Acemoglu et al. (2001) asserted that inclusive institutions are the primary cause of economic prosperity, shaping incentives for investment and innovation. Their view suggests that without strong institutions such as property rights, contract enforcement, and political accountability, firms will underperform or fail to emerge from their respective industries. However, economists Ha-Joon Chang (2002) and Dani Rodrik (2007) provided a different view, asserting that structural transformation can precede institutional reform. Empirical evidence shows that late industrializers like South Korea and Taiwan developed world-class firms under authoritarian or institutionally weak conditions. These firms not only prospered despite imperfect institutions, rather they also contributed to the development of better institutions (Chang, 2002). Rather than a linear causality, a co-evolutionary model is a more proper answer, where institutions and firms mutually reinforce each other. Structural change cannot

be initiated by institutions alone, but by the feedback loop of demand (households) and supply (firms). Eventually shaping and reconfiguring the economy's institutional frameworks over time.

Conclusion

This essay encapsulates a narrow coverage in the discussion of economic development. It offers a different approach to the view of AJR, where institutions must come first to enable economic development. This essay demonstrated that institutions are neither the sole reason nor the initiating cause of economic prosperity. Firstly, we have learned through the employment of Porter's Diamond Model that Taiwan's ascent in the global supply chain through TSMC emerged from authoritarian rule. Yet firm behavior and the other factors around it, allowed for the company to scale up and move to the upper echelon of the global supply chain. Secondly, Ford's adoption of mass production and efficiency wages reshaped labor markets and productivity – allowing for the development of rural areas in America.

Lastly, economic development is inherently dynamic and not just solely because of institutional quality. Rather, a feedback loop between technological advancements and effective demand is in play – asserted by Pasinetti. In addition, we have also tackled the chicken and egg dilemma in this paper on which has to come first. Whether good institutions incentivize firm behavior or the other way around? Given the cases explored and the literature provided, it reveals that a more realistic answer to this discussion is that firm behavior and institutions have more of a co-evolutionary model rather than a sequential one as expressed by AJR.

References

- Acemoglu, D., Johnson, S., & Robinson, J. A. (2001). The colonial origins of comparative development: An empirical investigation. *The American Review*, 91(5), 1369-1401. <https://economics.mit.edu/sites/default/files/publications/colonial-origins-of-comparative-development.pdf>
- Chang, H. J. (2002). *Kicking away the ladder: Development strategy in historical perspective*. Anthem Press.
- De Bruin, L. (2018). *Porter's Diamond Model: Why some nations are competitive and others are not*. Business-to-You. <https://www.business-to-you.com/porter-diamond-model/>
- Eli, S., Hausman, J. K., & Rhode, P. (2023). *The Model T* (NBER Working Paper No. 31454). National Bureau of Economic Research. https://www.nber.org/system/files/working_papers/w31454/w31454.pdf
- Ford, H. (1922). *My life and work*. Doubleday, Page & Company.
- Halevi, J. (1994). Structure and growth. *Economie Appliquée*, 2, 57-80. https://www.persee.fr/doc/ecoap_0013-0494_1994_num_47_2_1511
- Harris, K. (2020). *Forty years of manufacturing employment*. United States Bureau of Labor Statistics. <https://www.bls.gov/opub/btn/volume-9/forty-years-of-falling-manufacturing-employment.htm>
- Kim, O., & Wang, J. K. (2024). *Land reform in Taiwan, 1950-1961: Effects on agriculture and structural change*. https://oliverwkim.com/papers/KimWang_Taiwan.pdf
- Lacy, R. (2003). *Wheels of change: The automotive industry's sweeping effects on the fifth district*. Federal Reserve Bank of Richmond. https://www.richmondfed.org/publications/research/econ_focus/2003/winter/economic_history
- Lee, C. W., Hayter, R., & Edgington, D. (2010). Large and latecomer firms: The Taiwan Semiconductor Manufacturing Company and Taiwan's electronics industry. *Journal of Economic & Social Geography*, 101(2), 177-198. https://www.researchgate.net/publication/46541360_Large_and_latecomer_firms_The_Taiwan_semiconductor_manufacturing_company_and_Taiwan's_electronics_industry
- Ministry of Education. (2024). *Promoting industry-academia collaboration to train intermediate and highly skilled talent*. Executive Yuan. <https://english.ey.gov.tw/News3/9E5540D592A5FECDD/9d56eccf-e933-41a1-a9d2-3b408d9f06c5>

- Page, B., & Walker, R. (1991). From settlement to Fordism: The agro-industrial revolution in the American midwest. *Economic Geography*, 67(4), 252-315.
https://geography.berkeley.edu/sites/default/files/walker_51.pdf
- Pasinetti, L. L. (1993). *Structural Economic Dynamics: A theory of the economic consequences of human learning*. Cambridge University Press.
- Porter, M. (1990). *The competitive advantage of nations*. Harvard Business Review.
https://economie.ens.psl.eu/IMG/pdf/porter_1990_-_the_competitive_advantage_of_nations.pdf
- Raff, D. M. G., & Summers, L. H. (1986). *Did Henry Ford pay efficiency wages?* (NBER Working Paper No. 2101). National Bureau of Economic Research.
https://www.nber.org/system/files/working_papers/w2101/w2101.pdf
- Rodrik, D. (2007). *One economics, many recipes: Globalization, institutions and economic growth*. Princeton University Press.
- Taiwan Semiconductor Manufacturing Company. (2025, January). *4Q24 Management Report* [Management report].
https://investor.tsmc.com/english/encrypt/files/encrypt_file/reports/2025-01/2d8b2bb6fc3b5887d24ae0635f639c1cdca834f3/4Q24ManagementReport.pdf
- Taiwan Semiconductor Manufacturing Company. (n.d.). *A brief introduction to TSMC*.
<https://investor.tsmc.com/static/annualReports/1998/html/intro.htm>
- Valli, V. (2009). *The three waves of the Fordist model of growth and the case of China*. (SSRN Working Paper No. 5/2009-GE). Social Science Research Network.
https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1486113
- Windham, P. (2003). *Securing the future: Regional and national programs to support the semiconductor industry*. National Academies Press.
<https://nap.nationalacademies.org/read/10677/chapter/9>
- Zhang, M., Lie, J., & Sun, H. (2009). The experience and enlightenment of the reform and development of higher engineering education in Taiwan. *Advances in Social Science, Education and Humanities Research*, 385, 349-351. <https://www.atlantispress.com/proceedings/iceemr-19/125931707>