
Estimating the welfare loss due to vehicle tariffs in Malaysia

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Abstract: The Malaysian Government initiated domestic automobile production in 1985, paired with hefty tariffs on imported vehicles to protect the growing industry, using the infant industry argument as underlying. To gain empirical knowledge on the effectiveness of the infant industry argument for the automobile industry, the cases of Japan, South Korea and Spain are briefly analysed. The findings suggest that the Malaysian Government has failed to implement the infant industry type policies successfully. Additionally, the welfare cost of protecting the Malaysian vehicle industry is calculated using a Harberger triangle welfare loss analysis. The welfare loss is estimated for the year 2017 at MYR 11.3 b (US\$2.8 b). It is suggested that the benefits of keeping the protectionist measures are too small to justify the costs. To close the article, policy recommendations are presented to reduce the welfare loss by gradually opening the sector up to international competition.

Keywords: empirical studies of trade; Malaysia; Spain; Japan; automobile industry; tariffs; welfare loss; Harberger triangle; infant industry.

Reference to this paper should be made as follows: Borer, D., Tan, K.L. and Shen, B.C.T. (2021) 'Estimating the welfare loss due to vehicle tariffs in Malaysia', *Int. J. Automotive Technology and Management*, Vol. 21, Nos. 1/2, pp.137–160.

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This paper is a revised and expanded version of a paper entitled 'Estimating the welfare loss due to vehicle tariffs in Malaysia' presented at ICOTECH 2018, Penang, Malaysia, 17–18 November 2018.

1 Introduction

When Malaysia launched its local vehicle manufacturer Proton in 1985 under PM Mahathir, it was accompanied by hefty tariffs on vehicle imports to allow the local car industry to develop. As it became evident that the measures did not result in an internationally competitive car industry, the hefty tariffs, which range from a total of 70% up to 115% (MAA, 2018a) have received much criticism. Nehru (2012) noted that “Malaysia has so far failed to establish an internationally competitive car industry.” Economist Amillurah also questioned the protectionist barriers as a response to Malaysia’s new PM mentioning the possibility of further limiting car imports (*StarBiz*, 2018). Criticism became even more prevalent as Mahathir, in his second term as PM from 2018–2020, attempted to re-launch the national car, suggesting the introduction of a new brand (Leong, 2018).

The main argument of the advocates of the protective measures, on the other hand, is employment, and to a lesser degree, the contribution of the car industry towards the Malaysian economy. According to the Malaysian MITI, the industry employs 710,000 people (5% of total employment) and contributes to the GDP with approx. 160 b MYR (40 b USD), an equivalent to 4% of Malaysia’s GDP. Dato Mustapa, Minister of the Malaysian MITI, praising the growth of Malaysia’s car industry, claimed that “the growth of the automotive industry has created new career opportunities for Malaysians” in which over 27,000 new jobs have been created within 2018 (MAI, 2018). Malaysia’s PM Mahathir claimed during his 2nd mandate, that if the national automobile industry would be given up, “There is no more national car. No more automotive industry. The workers, engineers, managers wouldn’t have jobs anymore.” Furthermore, he provocatively claimed that without the automobile industry, “Malaysia would become

a country of consumers, paddy field planters and fishermen. Forget about Vision 2020” (*The Straits Times*, 2018).

The estimate of people employed in the industry varies, as other experts estimate that only 355,000 workers had been employed in 2017 (Hirschmann, 2019). Based on publications of the Malaysian domestic vehicle manufacturers, approx. 20,500 workers are employed at the domestic companies (Perodua, 2020; Proton, 2020) which suggest that the latter estimates might be more accurate.

Despite the heated debate on this topic, no estimates on the welfare cost resulting from the protective measures have been undertaken so far. The main objective of this article is to close this gap, providing actual numbers on the costs for Malaysia of maintaining the tariff on imported vehicles, which hopefully allow for a more informed and constructive debate.

The paper is structured as follows. Section 2 presents the theory on the Harberger triangle along with a literature review. Section 3 presents the theory on the infant industry argument as well as brief case studies on the automobile industries of Japan, Korea and Spain, in the context of infant industry cases and contrasting it with the Malaysian case. Section 4 presents the calculation of the estimate on the welfare loss of Malaysia’s protectionism on its automobile market. Section 5 concludes this article with policy recommendations.

2 Economic theory on welfare loss due to taxation

2.1 *The Harberger triangle*

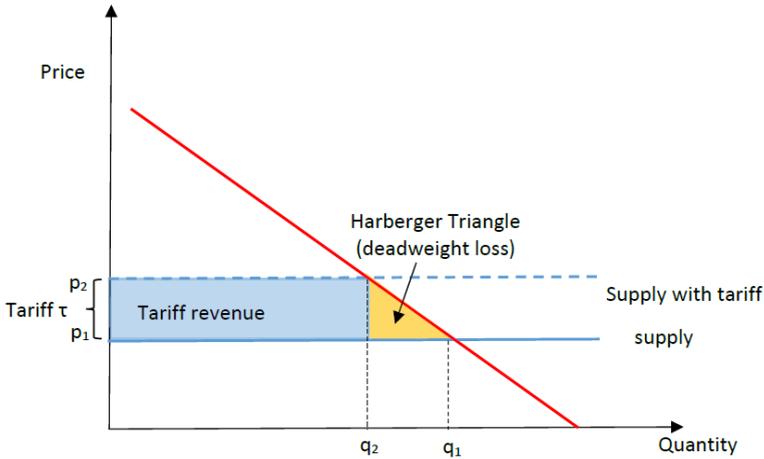
One of the first economists to develop a method of calculating the welfare losses due to taxation is Dui-puit (1844). Still, the specific deadweight loss of taxes is most often associated to Harberger (1964a, 1964b, 1971), a US-economist who specialised in public finance. The standard textbook graph of this theory is presented in Figure 1 in the case for perfect elastic supply as this will be relevant for the subsequent analysis. As the case presented in this article relates to a tariff, rather than a tax, an introduction of a tariff of τ on an import good will be modelled. The tariff increases the price of the imported good from p_1 to p_2 , which reduces demand from q_1 to q_2 . This decrease will be more pronounced in case of an inelastic demand if substitute goods are lacking. In the case of imported goods, a perfectly elastic supply is often assumed due to the atomistic competition structure of world markets. Figure 1 presents the model. It can be seen that the welfare loss is solely attributable to the loss of consumer rent.

Figure 1 exclusively presents the supply by foreign firms. For the case that will be analysed later, it is helpful to separate the domestic from the foreign supply, as, firstly, a tariff does not apply to domestic suppliers, and secondly, domestic supply is rarely perfectly elastic.

As most readers will be familiar, the rationale for the welfare loss are consumers who are discouraged by the high price of the good due to the taxation and therefore, either shift consumption to substitute goods rendering inferior utility or, in the lack of valid alternatives, stop consuming. The welfare loss incurred by these consumers is represented by the deadweight loss or Harberger triangle. Furthermore, consumers who still purchase the good despite of the higher price will need to allocate a higher portion of their budget

to acquire this good, thereby reducing consumption of other goods. The welfare loss of these type of consumers is captured by the government as tax income and thus, is typically not considered a welfare loss.

Figure 1 Welfare loss due to a tariff τ with perfectly elastic supply (see online version for colours)



2.2 Calculation of the Harberger triangle to estimate welfare loss

Harberger’s prominence with regards to the deadweight loss of taxes or tariffs is not only due to his effort in presenting the theoretical rationale of it, but to practical applications of the theory which he presented during the 1950s and 1960s (Harberger, 1954, 1964a, 1964b). The calculation of Harberger’s triangle in Figure 1 is represented by:

$$Welfare\ loss = \frac{1}{2}(p_2 - p_1)(q_1 - q_2)$$

Harberger’s methodology has not been free of critique as Hines (1999) highlights. An intense debate on the use of consumer surplus for welfare considerations was already ongoing before Harberger’s seminal articles. Marshall (1920) conceded that calculating consumer surplus is only valid if constant marginal utility of incomes over all goods is assumed. He also noted that difficulties arise when adding the welfare losses of several goods simultaneously, for example, when the implemented tax affects a series of differentiated goods. Walras (1954) criticised the use of a consumer surplus in general, claiming that it isolates the decision to consume and focuses on only one good, disregarding the potential utility gained when using the income for alternate goods. There is some consensus that caution needs to be applied when using this methodology for a complex model with several goods. Still, if the analysis is limited to one single good, the results can be considered more relevant.

Before using Harberger’s theoretical framework to calculate the welfare losses for the Malaysian vehicle industry, the infant industry argument will be discussed as it represents one additional, key element to understand the rationale of the protection of the automobile industry.

3 The infant industry argument

The infant-industry argument suggests that a government can build up a previously non-existing or small industry in their country by assisting it for a limited period of time. The government assistance mainly is through protectionist measures which reduces foreign competition and allows the crescent industry to be a privileged or sole supplier for the domestic market. In most cases, the government will flank the protectionist measures with additional subsidies or/and investment schemes especially if the industry is non-existing.

The argument was first mentioned by Alexander Hamilton, as part of a speech to the House of Representatives of the newly founded USA in 1791. In his speech, Hamilton's (1791) intention was to protect the cotton industry of the young union. Hamilton's (1791) argument was further developed and scrutinised by German economist List (1910), who advocated for protectionism against the technologically advanced British industry, comparing it to an unfair boxing fight between a child and an adult.

During the outbreak of the Industrial Revolution, many favoured protectionism, justifying it with the infant industry argument. Still, economists of the time also warned not to use it indiscriminately but only if certain conditions are met. Mill (1848) warned that protected industries need a projection of eventually becoming self-sustainable and competitive. Bastable (1891) added that the initial costs incurred by the protection need to be outweighed by the future benefits of the developed industry. If these conditions are not met, the infant industry argument becomes invalid (Govers, 2012). In a more recent study, Melitz (2005) presents a model that suggests that the infant industry argument is generally inefficient, but those inefficiencies are minimised by implementing quotas as opposed to tariffs. He also claims that the reduction of protectionism is best done gradually.

The infant industry argument has often been used to justify protecting technologically intense industries such as the manufacturing sector due to its high fixed costs and its potential for economies of scale. In numerous occasions, the vehicle manufacturing industry has been protected by governments under the premise of the infant industry not only due to economic arguments but also to raise the nation's prestige by having a 'national car'. In some cases, the infant industry argument was successful in promoting a domestic automobile industry, prominent examples being Japan, South Korea (Lee, 1997), and more recently, China (He and Yong, 1999).

Porter (1990) discusses the competitive advantage of nations, giving some insight into the conditions of building up a domestic industry to make it globally competitive. To succeed, Porter (1990, p.82) suggests to allow a certain degree of domestic competition as companies "must also have active domestic rivals who create pressure to innovate." Furthermore, on the timeline, he suggests tax relief to emerging companies for 5 or more years [Porter, (1990), p.86]. He further suggests that "it often takes more than a decade for an industry to create comparative advantage" [Porter, (1990), p.87]. Jacobsson (1993), using the case of South Korea, suggests an even longer period of 20 years for the infant industry argument, basing his claim on the long learning curve.

To gain empirical knowledge on the infant industry argument with respect to the automobile sector, the cases of Japan, South Korea, Spain and Malaysia are presented next.

3.1 Japan's car industry: a case of infant industry?

In early 1950s, the post-war Japanese economy was in poor shape and vehicle imports, which entered freely, exceeded the little domestic production, which amounted to 3,598 (Atsumi, 2017). Facing a fast depletion of bank reserves due to the country's negative trade balance, the Japanese Government attempted to reduce cash outflow by limiting imports in general. Car imports were no exception to this widely applied measure. In 1954, a quota on imported automobiles was established along with a tariff of 40% on passenger vehicles. As the trade balance improved in the subsequent years, the Japanese Government considered lifting the protectionist measures. In 1962, the government urged the car manufacturers to reduce costs due to the looming competition within the sector. In 1965, after only 11 years of protectionist measures, one of the main protectionist measures, the quotas, were largely lifted, signalling to the domestic vehicle manufacturers that the government would not tolerate protecting them much longer, forcing them to compete internationally (Nishiwaki, 2007). In the meantime, the industry had increased their vehicle exports from 7,013 units in 1960 to 100,716 units in 1965 (JAMA, 2010). The second import barrier, the tariffs, were moderately reduced to 36% in 1968. A further reduction occurred in 1972 to 8%. By that time, Japan's vehicle industry was already exporting almost 1.5 million vehicles p.a. Finally, in 1978, pushed by the GATT Summit that Japan hosted in Tokyo, the government lifted the tariff completely. Despite some non-tariff barriers still existing, the Japanese vehicle market was largely liberalised.

Several reasons seem to be relevant for the Japanese government decision to liberalise the industry after only 11 years of protectionism. Firstly, the government's intent in establishing trade barriers in the 1950s was not to protect the domestic industry, but rather to protect its scarce financial reserves through limiting imports. As the Japanese Central Bank was able to gradually build up reserves, the main reason for the protectionist measures vanished. Secondly, Japan became a member of the GATT in 1955 and joined the OECD in 1964, thereby committing to trade liberalisation. Thirdly, pressure and influence of the USA towards reducing protectionism was also important due to the USA's prominent position in international politics of that time. Fourthly, the rapid increase in vehicle exports especially in the first half of the 1960s gave the confidence that the Japanese automobile industry would be able to compete internationally.

The Japanese case, often mentioned as a model for the infant industry argument in the automobile sector, was not a well-defined strategy of the government towards that specific industry, but rather an accidental, fortuitous by-product of other interventionist policy measures. The fact that the protectionism granted by the government was only short-lived, forced the industry to use the little time they had to become rapidly competitive. Fortunately for Japan, the car manufacturers were not given the opportunity to indulge comfortably in an indefinite state of protectionism.

3.2 Korea's automobile industry: the Asian wunderkind

In 1961, South Korea was still struggling to recover from their recent Korean War, facing a weak economy with no automobile production. Under a new military, dictatorial government, an ambitious national economic plan was put in place to boost the economy by encouraging exports while limiting imports. Companies that managed to increase

exports received benefits while those who did not, faced the possibility of being shut down by the government. In 1962, the Automobile Industry Protection Law banned the import of foreign vehicles [Pichnorak and Vouchneng, (2013), p.2]. Simultaneously, the government launched half-hearted vehicle manufacturing focused on trucks and buses. As no passenger cars were produced nor imported, two local producers, Daewoo and Hyundai, emerged to fill the lack in supply. With no technological knowledge, they limited themselves in assembling imported car parts. Towards the end of 1960, the country assembled less than 30,000 vehicles per year.

In 1974, vehicle assembly plummeted to 9,069 due to the first oil shock. This threatened to wipe out the still frail industry which drew the attention of the dictatorial government. In 1974, the 'Long-term Automobile Production Plan' was implemented, which intended to boost the domestic automobile industry [Frédérique, (2001), p.209]. Hyundai launched the first Korean car in 1975 and started exporting it in 1976. By 1979, total production had risen to 204,447 units while recording some early success in international markets [Pichnorak and Vouchneng, (2013), p.3].

The second oil shock in 1979 paired with domestic political tensions threatened to severely damage the industry [Green, (1992), p.411]. The government heavily assisted the automobile industry once again, resulting in an excess production of vehicles that saturated the domestic market [Green, (1992), p.415]. Car producers were forced to find new foreign markets to accommodate their excess supply, with the government providing additional export assistance. In order to reduce domestic supply, the government forced the smallest vehicle manufacturer, KIA, to stop passenger car production and focus on light trucks [Lee and Cho, (2001), p.2]. Kia resumed passenger car production in 1986.

A major wave of liberalisation was implemented in the first half of the 1980s. On one hand, large Korean exporting business conglomerates (chaebols) urged the government to liberalise, seeing protectionism as unnecessary and counter-productive [Henderson, (1998), p.19]. On the other hand, the USA, a key international trading partner, pressured for trade liberalisation [Bishop, (1997), p.109]. The number of freely importable goods increased to 80% in 1983 and further to 95% in 1988 [Kim, (1991), p.28]. Despite of the widespread liberalisation, some non-tariff barriers were maintained for the automobile sector and other key national industries such as steel and petrochemicals.

Throughout the period of 1960–1980, the government had three main strategies to promote their industry, including the automobile industry, which proved successful:

- 1 *Pressure towards exporting*: The government would reward international success of firms and tie financial assistance directly to the level of exports [Green, (1992), p.420]. From 1962 to 1980, export-oriented businesses would pay on average half the interest rate commonly charged on commercial loans.
- 2 *Protection from foreign competition*: Especially in the early period, durable consumer goods were prohibited from being imported forcing import substitution with domestic products.
- 3 *Implementing time limited plans*: Though the government did not signal ending the protectionist measures anytime soon, the implemented plans typically were five years long. This raised awareness that any assisting measure, including protectionism, might be withdrawn once the plan concluded.

Korea's automobile industry is often regarded as a successful infant industry case. A simple reading would place the starting point in 1962, when imports of passenger cars

were formally prohibited. Still, it needs to be noted that passenger car production was non-existing and no 'national car' was promoted at that time. In fact, the promotion of a national car was initiated by the government in 1974 when large-scale, wide-reaching assistance to their domestic car project was implemented alongside the protectionism of the industry. These assistance schemes together with the protectionist measures largely ended in 1987. Hence, the Korean infant industry case seems rather to have started in 1974 and ended in 1987, having a duration of 13 years.

3.3 Spain's car industry: from pride to embarrassment to pride again

In 1950, the Spanish automobile manufacturer SEAT was established by the dictatorial military government led by Franco. The company intended to model industrial advancement that should fill Spaniards with pride (San Román, 1995). Due to lack of capital and technology, the government partnered with Italian car manufacturer FIAT. In 1953, the first car was produced. In 1955, 7,000 units were produced (Viana, 2013). In 1957, a second model was launched, the '600', which became SEAT's flagship model until 1973. During the post-WWII period, Spain and Portugal were the only still existing, fascist, German-Nazi friendly countries and, thus, politically and economically isolated. Spain was excluded from the newly emerging, international organisations like UN, OECD and GATT.¹ The Spanish Government was comfortable in their isolation and implemented widespread trade quotas which were selectively granted to businessmen friendly to the regime. In 1959, the Spanish economy was facing a severe economic crisis with the government close to bankruptcy. Under this pressure, Franco put in place a team of technocrats to implement economic reforms (Navarrete, 2005). One measure was a widespread liberalisation of imports (Dagnino, 1967). Still, the import limits on automobiles were excluded from this first wave of liberalisation. The initial success of SEAT with its '600' model rightfully gave the company a feeling of being competitive. It produced 799,419 units of this popular model until 1973 (Cervera, 2017). Despite the liberalisation efforts in other areas, the automobile sector was even further protected by a law on 'national levels' of production in 1964 (García, 2001). Being isolated from foreign competition, SEAT arguably became over-confident and complacent leading to a gradual loss of the quality it was initially known for. When Spain finally transitioned peacefully to democracy due to Franco's death in 1975, the newly elected government faced great political challenges while trade liberalisation was not a pressing matter and hence, was largely kept in place (Madrid and González, 2008). Throughout the time of transition and early democracy, SEAT became a despised and ridiculed car brand in Spain due to its decreasing quality levels.² To make matters worse, FIAT abandoned SEAT in 1980, as the Spanish automobile manufacturer was highly indebted with bankruptcy looming (Lewin, 1981). As Spain became member in 1986 of the EEC, the precursor of the European Union, the government was forced to lift protectionism of the automobile sector towards the European counter partners. SEAT, unable to compete with the powerful European automobile brands, was acquired by German Volkswagen (*El País*, 1986). From then onwards, SEAT profited from Volkswagen technology, especially their motors, and again, became a respected and even attractive brand not only in Spain but many European countries. Automobile production in Spain hit 3 million units in 2000 exporting well over 2 million units yearly over the past decade, becoming currently the eighth largest car producer worldwide (EP Motor, 2018).

Spain is, again, an example of the infant industry policy unintentionally implemented and accidentally removed. Contrasting with Japan's and South Korea's case, Spain retained the protectionist measures for a lengthy period of 33 years, which allowed the sole company to enjoy benefits without the need of being competitive. Arguably, this was ultimately damaging for the industry, eventually becoming a mockery for technological pretension. A late and externally forced move towards liberalisation almost risked eliminating Spain's most prominent (and only!) automobile manufacturer which was prevented by a strategic coalition with a strong, foreign partner.

3.4 *The Malaysian automobile sector*

As has been mentioned in the introduction, Malaysia's brand Proton was launched in 1985 in an attempt to initiate a thriving domestic automobile industry, following Japan's success model. The 'national car', was part of the Heavy Industry Plan (HICOM) launched by the newly elected government of Prime Minister Dr. Mahathir to achieve several goals: boost the Malaysian economy, give attractive employment opportunities to the ethnic Malay (Bumiputera Policies) and support the creation of Malaysian owned companies (dubbed 'Malaysia Inc.'). (Muhamad, 2008). The national car project was closely linked to honour and pride as can be seen by a speech of Mahathir in 1985: "[the national car] is a symbol of Malaysians as a dignified people" (Yunus, 1985). Furthermore, Mahathir, during his second, recent mandate as PM, recently acknowledged the pursuit of an infant industry type protection with the Malaysian vehicle industry claiming that "We need to protect our infant industry" (*The Star*, 2018).

As Malaysia lacked any automobile technology in 1985, Proton partnered with Mitsubishi which was the weakest Japanese automobile producer of the time and thus, was questioned as appropriate choice [Wad, (2009), p.182]. As can be seen in Figure 2, Proton experienced increasing sales during the first 12 years of its initiation which demonstrates its early success.

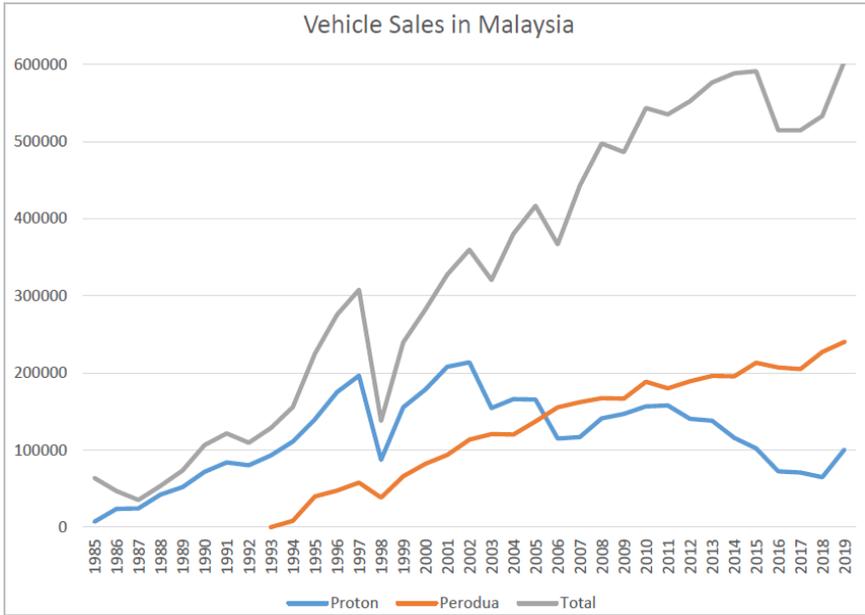
Proton started exporting vehicles in the late 1980s to the UK, and mid-1990s to Australia. After having some initial, moderate success in the UK, sales quickly plummeted due to its inferior technology.³ Based on the scarce export statistics published by the company, it seems that Proton was not meeting expectations. Mr. Mohamed, former minister of Industry, noted in 2018:

"I am not happy with the CBU exports. The number is hovering around 20,000. From what I see, it won't increase too much in the next few years." (Annuar, 2018)

Still, according to Carlist and PaulTan, exports in 2017 of Proton and Perodua reached 3,253 units in 2017 and 3,572 in 2018, far from the 20,000 units mentioned by the minister in 2018. While the minister claimed exports to be at an unsatisfying level of approx. 7% of total sales (20,000 units), according to other sources, exports seemed to be 'hovering' around 1%.

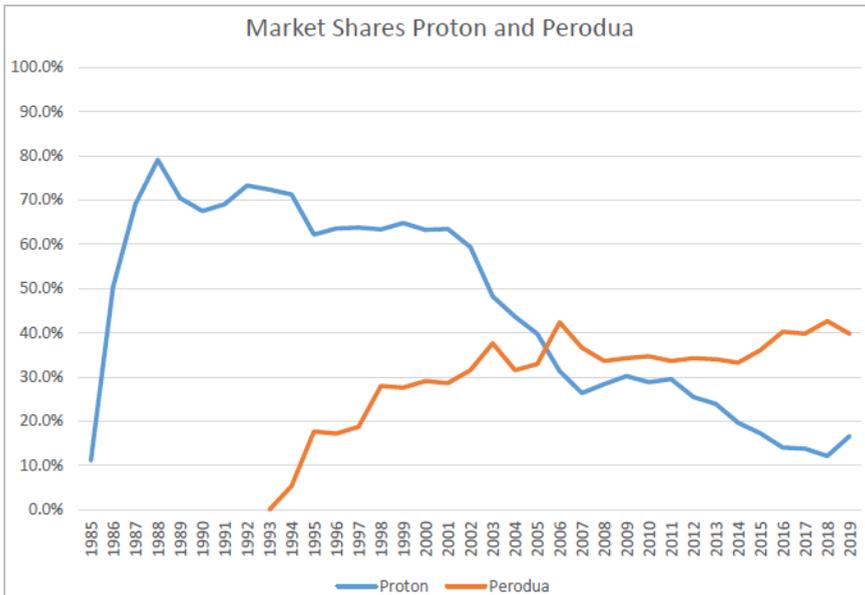
As Figure 2 shows, Proton experienced a sharp decrease in sales due to the Asian Financial Crisis in 1997–1998. Still, sales picked up again, reaching its peak in 2002 with almost 215,000 units sold. Since then, Proton has seen its sales falling despite the domestic increase in demand for vehicles.

Figure 2 Passenger sales of Proton, Perodua and overall sales of Malaysia



Source: MAA (http://www.maa.org.my/info_summary.h) and Rosli (2006)

Figure 3 Market shares of Proton and Perodua for Malaysia



Source: MAA (http://www.maa.org.my/info_summary.h) and Rosli (2006)

In 2004, Mitsubishi ended the partnership with Proton mainly due to internal challenges that the company faced in Japan. In 2017, Proton partnered with Chinese Geely (Mantle, 2017). This new partnership has given some boost to the aching company, with some

promising, new models. As Figure 3 shows, Proton has substantially increased sales in 2019 due to a sharp increase in domestic demand, after recording its lowest sales in 2018 since 1988. The increase seems temporary as it is expected that sales will, due to the Covid-19 crisis, hit a record low again in 2020. Overall, the Malaysian case seems to confirm the lessons from previous infant industry cases where the domestic automobile industry is able to thrive during their first 10–15 years but, as protectionism continues, it becomes increasingly complacent and inefficient.

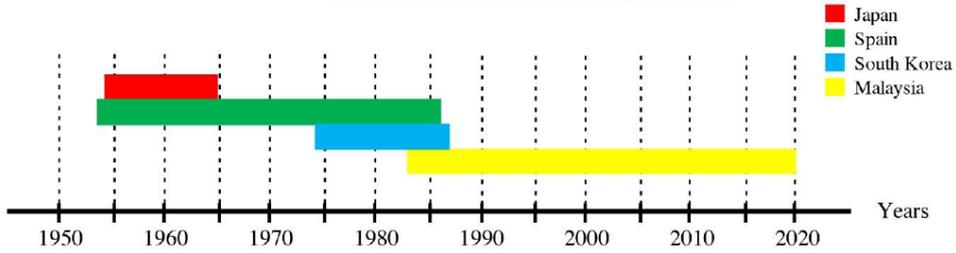
With traffic rapidly increasing in the early 1990s, the need in Malaysia for a small compact car became more evident, something Proton was not producing at that time. Additionally, Proton had lost its early competitive edge in foreign markets and started to display inferior quality. The PM Mahathir attributed Proton's poor quality on a lack of technology transfer from its partner Mitsubishi [Gomez, (2009), p.12]. As a result, the production of smaller types of vehicles was assigned to a new partner, Japanese Daihatsu, together with the founding of a second domestic car brand Perodua, in 1993, which enjoyed the same protectionist benefits as Proton. Toyota also became minority shareholder of Perodua through its Malaysian partner UMW (Tan, 2018). As can be seen in Figure 2, Perodua has experienced a persistent growth in sales, becoming currently the market leader in Malaysia with over 40% market share (see Figure 3). Perodua was initially supposed to focus on the smaller passenger cars which, until then, Proton did not offer. Still, a certain degree of competition exists nowadays between the two companies as they started producing models which penetrate into the others market (Drebee et al., 2014).⁴

3.5 Lessons for the Malaysian national vehicle

The Japanese and South Korean automobile industry is widely regarded as successful implementations of the infant industry argument while the Spanish as a failed example. Still, Japan seemed not to have any infant industry protection in mind when implementing their industry-supporting policies. In contrast, Spain and South Korea followed an infant industry argument in their starting phase. In all three cases, nevertheless, the ending of protectionism did not follow a well-timed plan of the government but rather followed external pressures paired with internal demands. Such changes accidentally benefited the industry in the case of Japan and South Korea, but for the case of Spain, it came too late. It seems to be politically easier for a government to initiate an infant industry protection rather than to end it.

With regards to the timing, the length of protectionism and support of the industry is similar for the successful cases, with Japan and South Korea lasting 11 and 13 years respectively, while the unsuccessful case of Spain's lasted for 33 years (see Figure 4). Furthermore, the Spanish car maker started to lose competitiveness after approx. 15 years. The empirical evidence seems to confirm Porter's suggestion of 'more than a decade' while suggesting that Jacobsson's (1993) proposition of two decades might be too long.

One additional aspect is the fact that the Japanese and South Korean automobile industry fortuitously included several domestic companies competing with each other, while the Spanish had only one company. This confirms Porter's aforementioned claim of the necessity of domestic competition to create a successful company.

Figure 4 Timeline of the automobile industry protectionism

Based on the previous empirical and theoretical arguments, we suggest that an optimal protections length for the vehicle industry during the latter part of the 20th century was of about 10–15 years. Furthermore, success would increase if 3 to 4 automobile companies would be allowed to compete domestically. It must also be noted, that, given the changing technology and changing market of the automobile industry, the lessons learned from the 20th century might not be valid anymore for the market conditions of the 21st century as new technology might increase the learning curve.

Contrasting these lessons with the case of the Malaysian's automobile industry, the perspective is rather discouraging. In 2020, the industry has already been protected for 35 years. For the first eight years, the industry had only one car manufacturer and for the latter 27 years only two. Throughout the entire time, the government has signalled that competition within the industry should be avoided.

In contrast to the other country cases, foreign pressure to liberalise has been very weak for Malaysia. By the time Malaysia joined the WTO in 1995, the wave towards free trade of the early 1980s had largely passed. Lately, the WTO member countries have been less adamant to enforce free trade. Furthermore, the ASEAN trade block of which Malaysia is a founding country, has only exerted soft pressure for trade liberalisation among their members. The intent of reducing tariffs of cars to 5% under AFTA first in 2003 and then delayed to 2005, was evaded by the Malaysian Government, *de facto* keeping the protectionist measures for their national vehicle industry. From a political perspective, this makes sense, as the potential gain of lifting protectionist policies is limited. Consumers who would welcome such a measure are an unorganised minority which suffer the consequences of protectionism in a few selected occasions in their lives, namely, when buying a foreign vehicle. Nevertheless, the political costs are immense: the government would lose their tariff income which is estimated in the following section at 20 b MYR (4.86 b USD) per year. Furthermore, reducing tariffs would put at stake the jobs of some 355,000–710,000 people currently employed in Malaysia's automobile sector. Similar to Spain, the Malaysian Government would need to present to their voters a trade-off of policies that, on one hand, presents huge benefits for the country but, on the other hand, would require unpopular measures like lifting the trade barriers for the automobile sector. In Spain, joining the EU was a welcomed trade-off. In the case of Malaysia, no such trade-off seems apparent in the present and even in the near future. Most probably, the protectionist measures will stay in place and the gap of the Malaysian automobile industry towards their international competition will widen. Unless the government takes bold measures, it is estimated that towards the end of this decade, when the international automobile sector transitions toward autonomous driving, the Malaysian

vehicle companies will be in such a technological disadvantage that the citizens will avoid purchasing them despite of great price differentials.

In the following section, the calculations of the estimated welfare losses of the protectionist measures of Malaysia’s automobile industry are presented which allows to identify the costs of these trade barriers.

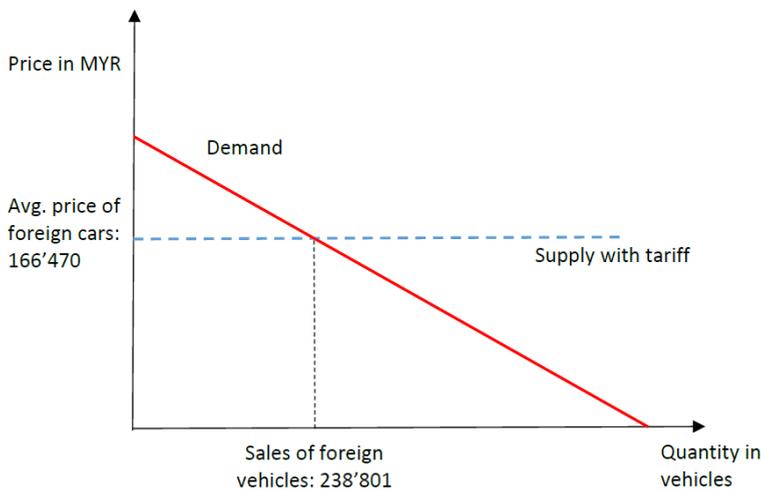
4 Estimation of the welfare loss due to tariffs on Malaysia’s automobile market

4.1 Framework for the vehicle market of Malaysia

To estimate the welfare loss due to Malaysia’s import restriction on imported vehicles, the market for imported cars is modelled. To do so, we make the following assumptions: firstly, it is assumed that vehicles are normal goods which exert no externality, which is clearly unrealistic. We justify this assumption by claiming that, on one hand, vehicles exert negative externalities that have been abundantly studied (see for example, Parry et al., 2007) but on the other hand, also positive externalities which include increased mobility, a more dynamic labour supply, increased well-being due to improved access to recreation, etc. Furthermore, the automotive industry exerts positive externalities through spill-over effects on other manufacturing industries (Dicken, 2007). Therefore, the correct level of appropriate taxation is unclear. We further justify this assumption by the fact that the Malaysian Government’s intent by taxing car imports is not to correct an externality, but solely as import-switching measure.

Secondly, it is assumed that the supply for imported vehicles is perfectly elastic as it is given by a competitive world supply.

Figure 5 Modelling the market for foreign vehicles in Malaysia in 2017



Passenger vehicles registered in Malaysia in 2017 were 514,679 units (MAA, http://www.maa.org.my/info_summary.htm), of which 238,801 belonged to foreign brands.⁵ Next, the average sales price of foreign vehicles must be estimated. To do so,

21 foreign automobile brands are taken into consideration which account for 99.9% of total unit sales of all foreign cars in Malaysia for the year 2017. Of these 21 foreign brands, the sales price in Malaysia for 399 of their most popular vehicle models is identified. Next, the median price⁶ is computed weighting each brand by its market share. The exact table can be found in Appendix 1. The resulting average price for foreign cars is thereby computed as being 166,470 MYR (41,141 USD). Figure 5 shows the market for imported vehicles, using this data.

4.2 Estimating the welfare loss in import market for vehicles in Malaysia for 2017

In order to estimate the welfare loss, the sales price of foreign vehicles without tariff needs to be estimated. The tariffs for passenger cars start at 75% and increase up to 105% according to the motor's power. Additionally, a 10% sales tax is included to all categories (MAA, 2018a). Hence, an average of 97.5% is applied. The resulting price without tariff and sales tax is estimated at 84,289 MYR (20,831 USD) per car for an average foreign vehicle.

Next, the resulting demand, in the hypothetical case that tariffs would be eliminated, need to be estimated. It will be assumed that Malaysian consumers would substitute the demand for domestic vehicles entirely with foreign ones. We justify this assumption by the price comparison and the current demand structure. Using the same methodology as before to arrive at an average foreign vehicle price, the average price for domestic cars is estimated at 44,090 MYR. Hence, even without tariffs, domestic vehicles would still be 47.7% cheaper than the average foreign ones. Nevertheless, the average foreign vehicle price includes luxury models of Mercedes, BMW, Lexus, Jaguar, Audi and others for which domestic cars are considerably inferior. Looking at inexpensive, foreign models, 42 models of nine different brands have lower prices than the average domestic vehicles, excluding tariff.⁷ Furthermore, the fact that in 2017, despite of tariffs in place, the majority of purchased vehicles were foreign, signals that foreign cars are highly preferred to the local one. Therefore, the assumption that Malaysians would substitute all of their demand of domestic towards foreign cars is reasonable.

It is furthermore assumed that total car demand would not increase further, which is clearly unrealistic, but, given the data available, it is difficult to estimate such demand increase. Hence, the increase in demand for foreign cars will solely be due to consumers substituting from domestic to foreign vehicles.

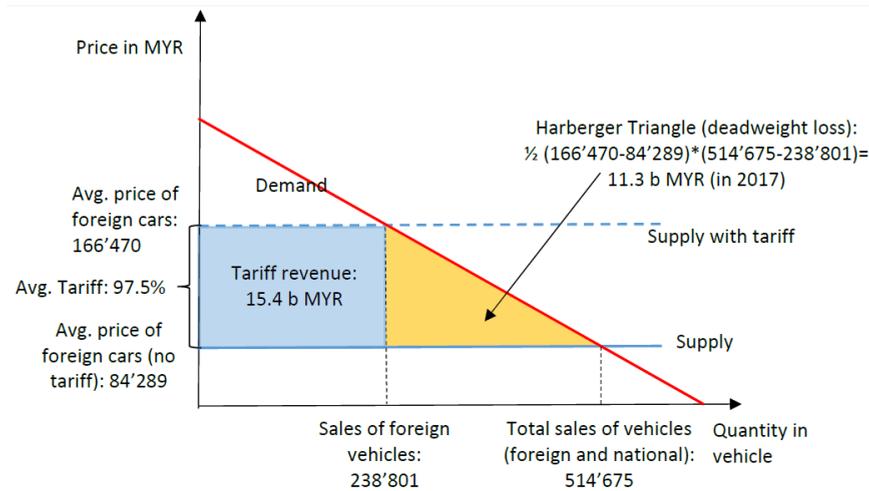
Thus, the dynamic suggested in the model is that the current, total demand for vehicles – local and foreign – is a fair estimate for the resulting demand for foreign vehicles if the tariff is eliminated, which seems an appropriate approximation to reality.

Figure 6 presents the model graphically. By calculating the area of the corresponding rectangle, is estimated that the government income of the tariff and sales tax of foreign vehicles during 2017 was 19.62 b MYR (4.85 b USD). This amount is not considered a welfare loss, assuming that the government will use this income to finance projects that are beneficial to society.

The welfare loss is estimated by calculating the area of Harberger's triangle as given in Figure 6, by the following equation:

$$\text{Welfare loss} = \frac{1}{2} (166,470 - 84,289) * (514,675 - 238,801) = 11.3 \text{ b MYR}$$

Figure 6 Estimating the welfare loss due to import restriction of foreign vehicles in Malaysia for 2017



Hence, the welfare loss in 2017 is estimated to be 11.3 b MYR (2.8 USD in 2017). This amount is not revenue for the government but wealth that is lost for the entire society due to the inefficiency of protectionist measures. While the welfare loss represents only 3.76% of Malaysia’s total manufacturing value of 2017, it is noteworthy to compare this welfare loss with the total estimated sales revenue of the two Malaysian domestic vehicle manufacturers, Perodua and Proton. According to the median price with the method used beforehand and the corresponding units sold in 2017, both companies had a total, estimated revenue of 12.16 b MYR. Hence, according to the present calculations, to allow the two automobile producers to achieve a revenue of 12.16 b MYR, Malaysians are burdened with a welfare loss of 11.3 b MYR. Alternatively, for each 1 MYR of sales that the domestic companies make, the public bears an additional welfare loss of 0.93 MYR.

The welfare loss can also be compared to the total value of the two companies. The sum of Proton’s and Perodua’s assets, according to their balance sheets, is equal to 9.8 b MYR.⁸ Hence, the total value of the two companies protected by the Malaysian Government is worth less than the welfare loss incurred by Malaysians in one single year. Using the current results, the welfare cost since the implementation of the policy can be extrapolated, rendering a rough estimate of 331 b MYR (82 b USD) from 1985 to 2019 (see Appendix 2 calculation details).

4.3 Further costs of protecting the Malaysian automobile sector

Besides the estimated welfare losses, the protective measures create additional disadvantages that are worth highlighting. According to Wad (2011), the lack of external competitive pressure has resulted in a complacent and inefficient management of the companies. Furthermore, the domestic companies face X-inefficiencies resulting in higher than average costs at suboptimal production technology. Consequently, they are unable to export and hence, unable to achieve economies of scale.

Having suboptimal technology also leads to higher number of traffic accidents and more tragic outcomes of those accidents due to the use of suboptimal safety technology in vehicles. While international car manufacturers have made great advancements in safety measures in order to attract customers, domestic producers have done so in a much lower degree due to lack of competition. Some loss of lives and tragic accidents could have been avoided if Malaysians had the ability to purchase foreign vehicles at world market prices. In this sense, the Malaysian Government needs to consider not only monetary costs of the protections measures, but also the fact that every day tragic accidents are occurring in order to keep a dying industry alive.

Additionally, the sub-optimal technology in domestic cars harms the environment unnecessarily, as local manufacturers are not pressed to offer invest as much into top technology due to lack of competition.

Lastly, the protectionist measures also discourage foreign direct investment in the vehicle sector. As Malaysia has opted to create a national automobile industry, limiting the access to international vehicle companies causes the country to be less attractive as an industrial hub for the international automobile industry. Other countries in the region like Thailand and Indonesia have abstained from creating an own vehicle, opening their doors to foreign producers. Both countries have been able to capture sizeable FDI's with all the benefits on the consumers, labour market and access to technology which this typically entails. In 2018, Thailand was the 11th top vehicle producer of the world and Indonesia the 17th while Malaysia ranked on place 23rd [International Organization of Motor Vehicle Manufacturers (OICA), 2018]. Thailand has even become one of the top pick-up truck manufacturers in the world without even having their own truck brand (Ariffina and Mohd, 2017).

Through this analysis and discussion, it should be evident that the 'national car' entails considerable costs while exhibiting limited benefits.

5 Conclusions

This article presents a calculation of the welfare loss due to a tariff in the case of Malaysia's protected automobile industry, which is estimated to have been 11.3 b MYR for the year 2017 (2.8 b USD).

The infant industry argument is presented, together with three case studies: Japan, Korea and Spain. It is argued that the optimal length of protection under the premise of the infant industry argument is approximately ten to fifteen years, after which it is suggested that the protected industry should be forced to compete internationally.

Based on the arguments presented in this paper, the outlooks for Malaysian's automobile manufacturers are grim. With a welfare cost of 11.3 b MYR per year, the cost of protectionist measures are too high compared to the size and prospects of the industry that is being protected. Furthermore, the fact that the industry has been protected for over 30 years suggests they missed the moment to liberalise the market in a helpful way for the domestic companies.

Therefore, it is recommended to implement several policies that could alleviate the situation. It is suggested that a gradual reduction of the tariff on imported vehicles is implemented. A possible reduction could be a 10% yearly decrease which would lift the tariff within 8 to 11 years.⁹ The tariff revenues during this transition period could be used to offer compensation packages, like early retirement and re-training possibilities to those

employees who choose to change to a different industry. Simultaneously, Perodua and Proton would be well advised to seek strategic partnerships with strong, well established and competitive foreign automobile brands which are allowed a majoritarian ownership of the companies. Due to the already existing ties to Toyota through UMW, Perodua could seek partnership with them, cutting their partnership with Daihatsu. This would allow Perodua access to the upcoming autonomous driving technology of which Toyota is intending to become one of the world's leaders. In the case of Proton, the authors are doubtful whether Geely is the partner of preference, as they are not market leaders in automobile technology. Possibly better choices would be to regain ties with Japanese Mitsubishi or with a South Korean company like Hyundai, which is a well-respected car brand in Malaysia and the most sold Korean car brand in the country. Mahathir, the architect of the 'national car' and strong supporter of Proton, resigned from his second mandate as PM in February 2020. It is possible that his successor, Muhyiddin, who seems less engaged with the national car project, might have a more pragmatic view on it and could choose a more objective plan to rescue the national automobile industry. Without a doubt, the debate on the best strategy for Malaysia's automobile industry and how much it should cost to the common citizen is far from over.

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Notes

- 1 In the UN discussions, the problem received the name of 'The Spanish question'. See United Nations, Security Council (1952, Ch. 8, pp.306–308).

- 2 The popular saying of the time changed the acronym to “Siempre estarás apretando tornillos”, meaning “You will always have to tighten some lose screws.” At that time, the far more expensive, foreign brands were preferred to SEAT.
- 3 According to Tong et al. (2012, p.360), “The decline [in sales in the UK] was attributed to the British demand for higher quality and safety standards, local competition and inadequate after-sales service.”
- 4 Estimates of the cross-elasticity of demand show an interconnection of demand of certain models of Proton and Perodua. See Drebee et al. (2014).
- 5 See Appendix 1, total/foreign brand.
- 6 The median, rather than the mean, is used due to the large price differential of some few, high class expensive models. This allows a more appropriate price average.
- 7 For example, smaller models of Honda and Toyota, which are very popular brands in Malaysia, would cost well below 40,000 MYR without tariffs. One of the most inexpensive models, the Kia Picanto 1.2 EX, would cost approx. 25,500 MYR without tariffs which would be only 3,000 MYR more expensive than the currently cheapest, domestic car, Perodua Axia E. See Carsome (<https://www.carsome.my/news/item/The-Ultimate-Malaysian-Car-Price-List-Without-GST>).
- 8 Data corresponds to Proton’s latest publicly published balance sheet in 2011 and Perodua’s MBM company holding’s balance sheet for 2014.
- 9 Melitz (2005), in his model for infant industry, also suggests a gradual reduction when lifting tariffs.

Appendix 1

Unit sales by brand and median price of vehicles (see online version for colours)

	<i>Number of models accounted for</i>	<i>Median price of models</i>	<i>Unit sales 2017</i>	<i>Price (weighted by sales)</i>
Total			514,003	
Total/no. trucks			513,156	
Total/foreign brand			238,125	
Perodua		42,752	204,887	31,751
Honda	48	97,097	109,511	44,654
Proton		47,953	70,991	12,340
Toyota	43	109,779	47,615	21,951

Notes: The price (weighted by sales) is calculated by multiplying the median price of models times the market share of the brand by unit sales, segregated by foreign and domestic. Hence, Honda’s price (44,654) is calculated by multiplying its median price (97,097) times 45.99% which is their market share in the market for foreign vehicles in Malaysia (109,511/238,125).

Source: Carsome (<https://www.carsome.my/news/item/The-Ultimate-Malaysian-Car-Price-List-Without-GST>), MAA (2018a, Table 2) and own calculations

Unit sales by brand and median price of vehicles (continued) (see online version for colours)

	<i>Number of models accounted for</i>	<i>Median price of models</i>	<i>Unit sales 2017</i>	<i>Price (weighted by sales)</i>
Nissan	28	111,671	19,949	9,355
Mercedes	51	385,388	12,067	19,530
Isuzu	14	107,789	141	64
BMW	19	366,834	10,618	16,357
Mazda	24	152,573	9,454	6,057
Mitsubishi	11	112,400	2,478	1,170
VW	14	163,688	6,536	4,493
Ford	18	116,354	551	269
Subaru	9	165,789	4,782	3,329
Kia	13	145,222	4,131	2,519
Hyundai	12	130,788	3,913	2,149
Peugeot	7	134,827	1,924	1,089
Volvo	10	319,747	1,021	1,371
Mini	12	248,521	1,011	1,055
Lexus	28	462,400	953	1,851
Audi	17	337,682	701	994
Renault	6	143,492	592	357
LandRover	7	499,811	120	252
Jaguar	8	546,227	57	131
Total	399			
			Average price	151,337
			Average price (incl. 10% sales tax)	166,470
			No taxes	84,289

Notes: The price (weighted by sales) is calculated by multiplying the median price of models times the market share of the brand by unit sales, segregated by foreign and domestic. Hence, Honda's price (44,654) is calculated by multiplying its median price (97,097) times 45.99% which is their market share in the market for foreign vehicles in Malaysia (109,511/238,125).

Source: Carsome (<https://www.carsome.my/news/item/The-Ultimate-Malaysian-Car-Price-List-Without-GST>), MAA (2018a, Table 2) and own calculations

Appendix 2

Calculation of welfare loss over the period 1985–2019

<i>A</i>	<i>B</i>	<i>C</i>	<i>D</i>	<i>E</i>	<i>F</i>	<i>G</i>
<i>Year</i>	<i>Domestic passenger vehicle sales</i>	<i>Consumer prices change (World Bank data)</i>	<i>Estimate of price for average car</i>	<i>Revenue estimation</i>	<i>Estimation of welfare loss (93.21% of revenue)</i>	<i>Cumulated welfare loss in each year in current MYR</i>
1985	7,060	0.346458791	19,831	140,014,105	130,507,147	130,507,147
1986	23,748	0.737002855	19,900	472,588,204	440,499,465	571,458,766
1987	24,390	0.290007909	20,047	488,937,982	455,739,093	1,031,409,526
1988	42,361	2.556519453	20,105	851,670,844	793,842,394	1,828,243,090
1989	51,989	2.813200897	20,619	1,071,953,970	999,168,295	2,874,150,775
1990	71,886	2.617801047	21,199	1,523,905,446	1,420,432,266	4,375,438,676
1991	84,080	4.358333333	21,754	1,829,085,463	1,704,890,560	6,194,869,516
1992	80,229	4.7672283	22,702	1,821,377,008	1,697,705,509	8,162,568,088
1993	93,066	3.536585366	23,784	2,213,519,201	2,063,221,248	10,614,917,592
1994	119,381	3.724970554	24,626	2,939,829,026	2,740,214,635	13,730,537,849
1995	179,714	3.450575096	25,543	4,590,399,471	4,278,711,347	18,520,707,687
1996	222,717	3.488559459	26,424	5,885,113,372	5,485,514,174	24,645,292,789
1997	254,167	2.662514597	27,346	6,950,449,407	6,478,513,893	31,983,572,374
1998	125,800	5.270342003	28,074	3,531,715,159	3,291,911,700	36,127,051,357
1999	221,433	2.744561302	29,554	6,544,172,327	6,099,823,026	44,130,893,545
2000	260,585	1.534740237	30,365	7,912,623,612	7,375,356,469	52,717,449,440
2001	301,663	1.416784732	30,831	9,300,514,927	8,669,009,963	62,195,535,312
2002	327,336	1.807872463	31,268	10,235,030,709	9,540,072,124	72,616,784,285
2003	275,347	1.089676326	31,833	8,765,115,191	8,169,963,870	82,099,567,001
2004	286,259	1.421271159	32,180	9,211,746,977	8,586,269,357	91,580,455,904
2005	302,947	2.975070927	32,637	9,887,318,704	9,215,969,764	102,098,032,275
2006	270,289	3.609235642	33,608	9,083,898,622	8,467,101,906	113,602,623,056
2007	279,014	2.027353178	34,821	9,715,590,104	9,055,901,536	126,758,710,954

Notes: The calculation uses the results of the year 2017, namely the fact that the welfare loss in that year was equivalent to 93.21% of the sales revenue of the two vehicle manufacturers, Proton and Perodua. The table of this appendix is built as follows: unit sales of domestic vehicles are presented in column B. The cost of one average, domestic car is calculated by the average value of one domestic car in 2017 corrected for each year with the consumer index changes (column D), rendering the estimated average value for one car in each year in column D. The revenue (column E) is estimated by multiplying the value of one average car with the number of cars sold ($B \times D = E$). The welfare loss is estimated at 93.21% of revenue sales in 2017. Using the same ratio for each year renders the welfare loss for each year in column F ($E \times 0.9321 = F$). This number is cumulated and corrected by the consumer price changes to render, in 2019, the value of 331 b MYR of cumulated welfare loss.

Calculation of welfare loss over the period 1985–2019 (continued)

<i>A</i>	<i>B</i>	<i>C</i>	<i>D</i>	<i>E</i>	<i>F</i>	<i>G</i>
<i>Year</i>	<i>Domestic passenger vehicle sales</i>	<i>Consumer prices change (World Bank data)</i>	<i>Estimate of price for average car</i>	<i>Revenue estimation</i>	<i>Estimation of welfare loss (93.21% of revenue)</i>	<i>Cumulated welfare loss in each year in current MYR</i>
2008	308,604	5.440782211	35,527	10,963,797,179	10,219,355,351	139,547,913,060
2009	313,680	0.583308406	37,460	11,750,480,135	10,952,622,534	158,093,033,623
2010	345,208	1.622852356	37,679	13,006,933,605	12,123,762,813	171,138,966,390
2011	337,891	3.174470922	38,290	12,937,874,482	12,059,392,805	185,975,691,943
2012	329,699	1.663571025	39,506	13,024,932,335	12,140,539,429	204,019,975,633
2013	334,066	2.105012312	40,163	13,416,988,294	12,505,974,789	219,919,967,622
2014	311,362	3.142990509	41,008	12,768,384,715	11,901,411,392	236,450,721,410
2015	315,482	2.104389802	42,297	13,343,957,677	12,437,902,951	256,320,248,093
2016	279,400	2.090566595	43,187	12,066,488,032	11,247,173,495	272,961,398,750
2017	275,878	3.871201158	44,090	12,163,461,020	11,337,562,017	290,005,400,587
2018	291,987	0.884709161	45,797	13,372,073,918	12,464,110,099	313,696,203,111
2019	341,162	0.662891866	46,202	15,762,360,306	14,692,096,041	331,163,598,197

Notes: The calculation uses the results of the year 2017, namely the fact that the welfare loss in that year was equivalent to 93.21% of the sales revenue of the two vehicle manufacturers, Proton and Perodua. The table of this appendix is built as follows: unit sales of domestic vehicles are presented in column B. The cost of one average, domestic car is calculated by the average value of one domestic car in 2017 corrected for each year with the consumer index changes (column D), rendering the estimated average value for one car in each year in column D. The revenue (column E) is estimated by multiplying the value of one average car with the number of cars sold ($B \times D = E$). The welfare loss is estimated at 93.21% of revenue sales in 2017. Using the same ratio for each year renders the welfare loss for each year in column F ($E \times 0.9321 = F$). This number is cumulated and corrected by the consumer price changes to render, in 2019, the value of 331 b MYR of cumulated welfare loss.