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RESEARCH ARTICLE



Modelling the determinants of birth tourism demand: a time series analysis

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ABSTRACT

Birth tourism has been steadily rising in recent years as potential mothers travel across borders with the main purpose of giving birth. However, the economic reasons behind this form of tourism have not been adequately examined in the existing literature. This study explores the determinants of birth tourism by incorporating factors such as the average income of visitors, price level, exchange rate, and infant mortality while accounting for the potential impact of the Citizenship Amendment Act 2005 in New Zealand. The variables have been introduced into the model using a standard tourism demand framework and a new dynamic autoregressive distributed lag method has been used in the study. Ultimately, rising income of visitors and exchange rate are reported to boost birth tourism while rising price reduces birth tourism. The result also shows that the implementation of the Citizenship Amendment Act 2005 has no significant effect on birth tourism, which implies that monetary and financial considerations such as the income of tourists, price level, and exchange are the most important drivers of birth tourism in New Zealand.

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Birth tourism; tourism demand model; Citizenship Amendment Act; New Zealand; dynamic autoregressive distributed lag

1. Introduction

Birth tourism, alternatively known as maternity tourism, refers to non-residents giving birth outside of their home country for several reasons including to obtain citizenship or residency rights, and have better access to health care for their newborns (Choi & Lai, 2022). It is attracting growing attention due to the increasing practice of individuals travelling to foreign nations with the explicit intention of delivering their babies there. It slows a bit during the pandemic, given travel restrictions, and it seems to be picking up again (Bednarski, 2022). The practice has a double-edged impact on the host countries.

On a positive note, a rise in birth tourism arrivals translates into an increase in total tourism arrivals and tourism receipts. In most countries, foreigners are often charged more for medical services than the local populace. Birth tourism generates extra employment in the medical industry of the destination countries because healthcare sector growth requires the services of more pharmacists, doctors, nurses, midwives, and medical assistants. It has the capacity to encourage reverse brain drain as few countries have used maternity tourism (among other measures) as a means to lure back to their home nations, health experts who had initially migrated abroad for greener pastures (Connell, 2006).

Birth tourism is an additional tourism activity through which host countries can diversify their tourism sector. Any adverse shock to a comprehensively diversified tourism market, emanating from political frictions with a number of countries will have a lesser effect on the destination nations (Solarin et al., 2023a, 2023b). Increasing birth tourists generates additional foreign exchange earnings in the host nations. Additional foreign exchange earnings imply more international reserves and a rise in the capacity of the destination countries to import needed raw materials (Cheng, 2016). Promoting birth tourism offers an additional avenue through which many destination countries increase tourism arrivals to the pre-COVID level (Bednarski, 2022).

In spite of the apparent benefits of birth tourism, many characteristics of this form of tourism have been overlooked by the extant literature, including the determinants of birth tourism. Determining the factors of birth tourism will provide hindsight to tourism authorities on which variables to focus on in order to promote birth tourism. This is even more necessary in the countries that have implemented citizenship law to discourage moving to their territories to give birth for the sole purpose of enabling newly born children to gain citizenship in the host countries. These countries need to roll out more comprehensive policies to attract birth tourism (relative to countries that have not amended their citizen laws), since the amendment of citizenship law in itself is a discouragement to birth tourism.

The few studies on birth tourism have principally focused on the public perception of birth tourism in countries that experience high inflows of birth tourists (Bednarski, 2022); the implications of birth tourism (Allotey et al., 2022); the effect of maternity tourism on health care services (Brar et al., 2022). There are also studies on the relationship between information and communication technologies (ICTs) and birth tourism (Kang, 2018). The only known study on the determinants of birth tourism is the study of Cheng (2016) which analysed of birth tourism of tourists from mainland China to Hong Kong. The outputs generated in the paper of Cheng (2016) cannot be generalisable to other destinations as host countries are likely to be different and factors affecting birth tourism are likely to be different in each destination.

The objective of this study is to investigate the factors of birth tourism in New Zealand for the period from 1980 to 2021. The first contribution of this study is the introduction of birth tourism to the standard tourism demand model. The existing papers on the determinants of tourism arrivals or tourism receipts have either used aggregate tourism arrivals or specific forms of tourism such as education tourism (Chattopadhyay et al., 2022). Hence, this study is an attempt to extend the standard tourism demand model by using it to examine the determinants of birth tourism, which has not been done before in the literature. The second contribution of this study is the use of a new Dynamic Autoregressive Distributed Lag (DARDL) approach to examine the determinants of birth tourism. The DARDL approach facilitates the extraction of the dynamic impact of each determinant of birth tourism, therefore assisting in predicting the likely path of birth tourism will take after a shock from the determinants of birth tourism.

New Zealand has been selected as a sample nation due to numerous factors. The country altered its citizenship rule from 'rule of the soil' or 'Jus Soli' to 'rule of the blood' or 'Jus Sanguinis' in 2005 and took effect in 2006. Before 2006, a baby born in New Zealand was regarded as an automatic citizen of New Zealand. Starting from 2006, one or both parents of the baby must hold a permanent resident visa of New Zealand or must be citizens of New Zealand for the baby to qualify for citizenship. Since the amendment of the Citizen Act is a discouragement for birth tourists that intend to give birth in New Zealand for the purpose of the child obtaining citizenship of the country, the amendment is expected to decrease birth tourism and the total tourism arrivals into the country. Hence, the country needs to introduce other policies to attract birth tourists in a bid to increase total tourist arrivals into the country. Such policies can be properly guided after a careful identification of the factors affecting birth tourism in the country. The number of birth tourism is still low in the country, although it has increased in the early 2000s. Birth tourism is not as popular as the other forms of tourism including business tourism or vacation/holiday tourism as arrivals for birth

tourism is less than 10% of either arrivals for business tourism or vacation tourism in 2021 (Statistics New Zealand, 2024).

Section 2 reviews relevant literature on birth tourism and other variables under consideration, Section 3 describes the methodology and data sources, Section 4 presents empirical results from the econometric analysis, and Section 5 discusses the findings and Section 6 involves conclusion and policy implications.

2. Literature review

The literature review delves into key factors influencing birth tourism, ranging from economic indicators like GDP and CPI to healthcare metrics such as infant mortality rates, and even currency exchange dynamics. These insights shed light on the complex interplay of socioeconomic and healthcare factors driving birth tourism decisions, underscoring the importance of empirical investigation. By bridging theoretical concepts with practical considerations, the literature review not only enriches our understanding of birth tourism but also lays the groundwork for the methodological and empirical analyses to follow.

2.1. Gross domestic product and birth tourism

Citizens in countries with higher average GDP often have better economic conditions and higher disposable incomes (Mooneeapen et al., 2022). Birth tourism can be an expensive venture, comprising costs such as travel, medical fees, and lodging. Parents from richer countries are more likely to be able to afford these costs, making birth tourism a viable choice for them. Furthermore, birth tourism is frequently motivated by a desire to have access to modern healthcare facilities and services that are not easily accessible or of poor quality in tourists' native countries. Furthermore, countries with higher GDP may have stronger diplomatic ties and preferential visa policies with certain tourism destinations (Fernandez, 2021). This could make it easier for expectant parents to travel to and stay in the target country for the period of labour and recovery.

Furthermore, countries with higher GDP often have superior educational systems and greater knowledge of global opportunities (World Bank, 2023). Expectant parents in these countries may be more informed about the benefits of birth tourism, such as access to advanced medical treatment and prospective child benefits, leading to a greater willingness to participate in this activity in other countries (Choi & Lai, 2022). This awareness could contribute to a greater inclination to engage in birth tourism in other countries. The research conducted on Chinese maternity tourism to Hong Kong indicates that economic factors such as income growth and the appreciation of the Chinese yuan have led to an increased demand for giving birth in Hong Kong, which provides the right of abode for Chinese babies born there (Cheng, 2016). Additionally, the implementation of the Individual Visit Scheme for Mainland Chinese tourists has also influenced this trend.

Another study focusing on Chinese women who travel to the United States to give birth highlights that these women are seeking a more positive childbirth experience and are motivated by the desire to secure a better future for their children (Jaramillo et al., 2019). The study's findings reveal that these women perceive childbirth in the United States as superior and believe that it will provide their children with future opportunities. This suggests that the decision to participate in birth tourism is not only influenced by immediate medical care benefits but also by long-term considerations for their offspring's well-being and prospects.

Additionally, residents of higher-income nations may have better access to foreign travel and be more used to exploring possibilities overseas. The global mobility attitude may lead people to explore birth tourism to offer their kids potential benefits like dual citizenship or better educational prospects in the destination country (Kardaszewicz, 2019). Higher-income countries typically have stronger technology infrastructure and internet usage, increasing access to information regarding birth tourism alternatives in various countries (World Bank, 2023). The ease with which birth

tourism organisations and services may be found may contribute to the favourable link between average GDP and birth tourism.

2.2. Consumer price index (CPI) and birth tourism

The effect of the CPI on the expenses associated with healthcare services in a host country is subject to variation, contingent upon the prevailing inflation rates and overall economic circumstances. The presence of a high CPI and a concurrent upward trend in inflation rates can have the consequence of escalating medical costs, thereby rendering medical tourism destinations (Zolfagharian et al., 2018) comparatively less financially accessible for prospective patients. In contrast, it is worth noting that a decrease in the CPI could potentially lead to heightened competitiveness in healthcare expenses. Also, a decrease in the CPI could potentially enhance the financial viability of the target location for individuals seeking medical treatment abroad. Consequently, this could render the destination more appealing to individuals seeking cost-efficient medical treatments, thereby attracting a greater number of tourists (Arshad et al., 2023).

In addition, it is notable that medical tourists frequently consider the perceived quality and value of healthcare services as crucial factors in their decision-making process when selecting a specific destination (Loureiro, 2017). The CPI possesses the potential to exert an indirect influence on the decision-making process regarding medical tourism. A positive correlation may exist between a higher CPI and the presence of superior facilities, infrastructure, and medical expertise within a given region. As CPI increases, it signifies an increase in consumer expenditure on goods and services (Agag & Eid, 2020; Sun et al., 2018). This heightened spending has the potential to stimulate economic activity and make a positive contribution to different sectors such as the health sector as well as overall economic development. Nevertheless, a lower CPI could potentially indicate a more favourable cost-effectiveness ratio, particularly when considering the perceived level of satisfaction with the quality of medical care (Agag & Eid, 2020; Bartolomé et al., 2009).

In relation to birth tourism, CPI holds the potential to have an impact on the comprehensive expenditure incurred by birth tourists throughout their stay. The perceived affordability of giving birth in a foreign country can be influenced by a high CPI and inflation. Contrarily, a decreased CPI could potentially enhance the attractiveness of a particular destination for birth tourists, particularly if it provides a favourable amalgamation of healthcare quality and affordability.

2.3. Infant mortality and birth tourism

In regions characterised by underdeveloped healthcare systems, limited access to high-quality pre-natal and neonatal care, and higher rates of infant mortality, expecting parents can demonstrate a tendency to explore alternative childbirth options (Boachie et al., 2020). Birth tourism is an increasingly attractive option for individuals seeking to secure improved healthcare services and enhance the likelihood of survival for their newborns. The presence of increased infant mortality rates can potentially act as a catalyst, prompting parents to partake in birth tourism.

Conversely, birth tourism itself may potentially result in implications for the rates of infant mortality in the countries that serve as destinations for such activities. The trend of pregnant women choosing to give birth in countries with lower infant mortality rates has the potential to exert pressure on the healthcare system and available resources (Boachie et al., 2020). Consequently, this may pose challenges in ensuring sufficient care for both domestically born infants and those born to foreign-born parents. The present circumstances possess the potential to exert an influence on the collective infant mortality rates within the designated country.

An extensive investigation was conducted by Lim et al. (2022) to explore the occurrence of birth tourism in a country that is distinguished by relatively low rates of infant mortality. The findings derived from their comprehensive investigation suggest that birth tourism does not appear to have any relationship with infant mortality. The research study placed considerable emphasis on

the importance of close monitoring and efficiently managing healthcare resources to ensure the provision of high-quality care for infants, irrespective of their nationality.

In a contrasting perspective, the investigation conducted by Ji and Bates (2018) delved into the intricate connection between birth tourism and inequality in health resource distribution. The research findings suggest that the influx of pregnant women engaging in birth tourism has resulted in a burden on the healthcare system. This situation has raised concerns regarding the ability to deliver sufficient care for both domestically born infants and those born to foreign nationals. The observed circumstances have indicated the potential presence of a correlation between birth tourism and elevated rates of infant mortality within the given context.

2.4. Exchange rate and birth tourism

Previous studies (e.g. Sharma & Pal, 2019) have established that interest rate has a significant impact on tourism demand. As such, the significance of exchange rates in shaping the attractiveness of a host country for birth tourism cannot be overstated. These rates indicate the relative value of one currency in comparison to another (Lee et al., 2021) consequently influencing the decision-making process of potential birth tourism. The relationship between birth tourism and currency exchange rates can be analysed from a variety of angles. First, it is essential to acknowledge the significant impact of economic factors. Yang et al. (2022) highlighted the affordability factor as a potential incentive for individuals to partake in birth tourism.

Additionally, currency fluctuations can influence birth tourism. Multiple economic factors, including interest rates, inflation, trade balances, and market sentiment, can cause fluctuations in exchange rates (Yang et al., 2022). The observed fluctuations may have an impact on the financial implications of birth tourism. The impact of a depreciating currency in the destination country may result in a relative increase in birth tourist expenses (Cheng, 2016), as the diminished value of their home currency reduces their purchasing power. Conversely, the attraction of birth tourism may be heightened by a strengthening currency in the host country, as individuals engaging in this would benefit from the increased purchasing power of their domestic currency. Considering this observation, an unfavourable exchange rate has the potential to further increase the financial burden associated with travel and healthcare expenditures for individuals engaging in medical tourism (Bahadori et al., 2009). Consequently, this circumstance may conceivably act as a deterrent, influencing their decision-making process regarding the selection of a specific destination. In such scenarios, birth tourism could create greater interest in countries that possess more advantageous currency exchange rates.

3. Methodology: model, estimation techniques, and data

Building upon the theoretical insights garnered from the literature review, this study aims to empirically investigate the determinants of birth tourism in New Zealand. The methodology adopts the standard tourism demand approach, treating birth tourism as a normal good influenced by consumers' income and the price to access maternity tourism, along with other pertinent factors. In addition to economic indicators such as GDP and CPI, variables including infant mortality rate (IFM) and bilateral exchange rate (EXR) are incorporated to capture health and monetary aspects affecting birth tourism. The methodology also accounts for the impact of the Citizenship Amendment Act of 2005, which altered birthright citizenship rules in New Zealand. Data sources for each variable are specified, and summary statistics are provided to facilitate a comprehensive understanding of the dataset. The literature review not only informs the selection of variables and modelling framework but also underscores the significance of the empirical analysis in advancing our understanding of birth tourism dynamics. The estimation technique involves applying the autoregressive distributed lag (ARDL) modelling technique, with a preference for the dynamic version (DARDL) due to its robustness with smaller sample sizes and flexibility in interpretation. Diagnostic tests ensure

the consistency, stability, and reliability of the model, thereby enhancing the credibility of the empirical findings.

3.1 Modelling the determinants of birth tourism

The primary objective of this study is to model the determinants of demand for birth tourism in New Zealand. Following the existing protocols in the extant literature including Cheng (2016) and Tang and Lau (2017), this study employs the standard tourism demand approach to model the demand function for birth tourism in New Zealand. The model is based on the theory of consumer behaviour and it assumes that tourism is like any normal good and as such the demand for maternity tourism is modelled as a function of consumers' income, and the price to access maternity tourism. The extension of the model in this paper is the focus on birth tourism, unlike other papers that have concentrated on other forms of tourism activities. Mathematically, the demand function for maternity tourism is specified as follows:

$$BT = f(Y, P, Z^+) \quad (1)$$

where BT represents maternity tourism, Y represents the income of the maternity tourists, P represents the price of accessing maternity tourism, and Z^+ captures all other possible factors including health-related factors such as infant mortality rate and monetary-related factors such as exchange rate that could affect the demand for maternity tourism.

In stochastic form, equation 1 is transformed as follows:

$$BT_t = \alpha_0 + \alpha_1 Y_t + \alpha_2 P_t + \alpha_3 Z_t^+ + \varepsilon_t \quad (2)$$

where α_0 is the intercept term and the remaining α_s are the unknown estimable parameters. ε is the error term and t is the time series notation which is yearly in this case. In this study, income is proxied by gross domestic product (GDP), and the price of maternity tourism is captured by the consumer price index (CPI). Z^+ is used to incorporate other regressors including infant mortality (IFM), and exchange rate (EXR). Thus, the expanded form of equation (2) is expressed as follows:

$$BT_t = \alpha_0 + \alpha_1 GDP_t + \alpha_2 CPI_t + \alpha_3 IFM_t + \alpha_4 EXR_t + \varepsilon_t \quad (3)$$

Relying on existing practice in the literature including Cheng (2016), we have used the number of new-born babies in New Zealand to foreigners.

Regarding the independent variable, we used the log of real GDP per capita (constant 2015 USD) as a proxy for the real income of maternity tourists. The marketing activities of Tourism New Zealand (which is the country's parastatal responsible for marketing tourism to the globe) are focused on high-value consumers in 15 key markets including Australia, China, USA, Canada, UK, and Germany. Others are Japan, South Korea, Singapore, Malaysia, India, Argentina, Brazil, Indonesia, and the Philippines. Thus, in line with Tang and Lau (2017), we have used the unweighted averages of the real GDP per capita across the 15 countries to proxy the real income of tourists. This proxy depicts the level of affluence and well-being of individual tourists. An increase in income in the source country has a positive impact on outbound tourism from the source country and a positive impact on inbound tourism in the destination country. A rise in GDP per capita, which is synonymous with a higher income intensifies the possibility of tourists realising their relaxation and escape, desire for social interaction, health and fitness, and adventure. Mothers usually require adequate rest during the post-childbirth period, and this can be accomplished by giving birth in a distant location including across borders. Assuming that maternity tourism is a normal good/service, the coefficient of real GDP is expected to be positive depicting that higher income will likely result in higher maternity tourism.

The consumer price index (*CPI*) is used to proxy the price of maternity tourism in New Zealand. It measures the monthly change in prices paid by New Zealanders on goods and services. It is calculated as the ratio of the cost of the market basket in the current period over a chosen base period multiplied by 100 such that the *CPI* for the base period returns the value of 100. Since the *CPI* reflects the cost of assessing maternity tourism, it is expected to have an inverse relationship with birth tourism in accordance with the law of demand which says the higher the price the lower the quantity demanded. The cost of travel is part of the several factors that constitute hindrances from moving from the origin country to the destination. Price is a resistance variable as many tourists often have limited incomes, particularly in relation to their daily needs (Frechtling, 2001). Thus, the coefficient of *CPI* in the model is expected to be negative.

IFM is the log of the number of infant deaths from birth and under one year of age in New Zealand every year. This is used as a measure of the infant mortality rate and can gauge the level of confidence the maternity tourists have in the survival of their newborns. Destination attractiveness is one of the factors that determine inbound tourism (Frechtling, 2001). In the case of birth tourism, health indicators can be used to represent destination attractiveness. This is because the quantity and quality of the health system in the host country suggest the extent of preparedness of such destination to draw tourists for different forms of medical tourism including birth tourism. Infant mortality is a health index that showcases the quality of health in the home country and affects total tourism arrivals including birth tourism. Advanced nations with superior healthcare facilities have reduced infant mortality (World Bank, 2023). The higher the quality of health facilities, the smaller the infant mortality and the higher the birth tourism arrivals. In terms of *a-priori* expectation, the infant mortality rate is expected to be inversely correlated with maternity tourism suggesting that the higher the number of infant deaths the lower the willingness of tourists to travel to New Zealand just for the sole aim of giving birth to new babies. Thus, the coefficient of *IFM* in the model is expected to be negative.

Another variable that has been incorporated into the model is the bilateral exchange rate (*EXR*) of New Zealand dollars (*NZD*) relative to the United States dollars (*USD*). Prices and real exchange rates are significant determinants of tourism inflows (Husein & Kara, 2020). The bilateral exchange rate measures the cost of acquiring the *NZD* using the *USD* by the maternity tourists. A higher exchange rate implies that more *NZD* can be acquired with a unit of *USD*, thereby increasing maternity tourism's affordability. Thus, a positive coefficient of the *EXR* is expected to increase maternity tourism since the appreciation of the *USD* relative to *NZD* implies a lower cost of assessing maternity tourism while a negative coefficient of the *EXR* is expected to reduce maternity tourism since the depreciation of the *USD* relative to *NZD* implies a higher cost of assessing maternity tourism.

The baseline model in equation (3) did not account for the potential impact of the Citizenship Amendment Act of 2005 on tourism maternity. In 2005, the New Zealand government enacted an act that repealed the common law principle that a person was a citizen of New Zealand simply by virtue of being born there. It became necessary for the applicant to have a parent who was at the time either a citizen or a permanent resident of New Zealand. The general perception was that the amendment was adopted to stop temporary immigrants from giving birth to children in New Zealand to permanently stay in New Zealand. If maternity tourists are driven purely by the intention to acquire birthright citizenship, then not accounting for this act will bias the result of the model in equation (3). In order to account for this, we estimated another equation that accounts for the Citizenship Amendment Act of 2005 to see whether the baseline model results will alter significantly. Consequently, equation (4) is specified as follows:

$$BT_t = b_0 + b_1GDP_t + b_2CPI_t + b_3NIFD_t + b_4EXR_t + b_5CAAD + \mu_t \quad (4)$$

where *CAAD* represents the dummy variable for the Citizenship Amendment Act of 2005, b_s represents the estimable parameters, μ is the stochastic error term, and all other variables remained as defined earlier. In principle, if maternity tourists are driven purely by the intention to acquire birthright citizenship, its coefficient will be negative, otherwise, it will be positive.

Table 1. Variable description and data sources.

Variable	Description	Source
<i>BT</i>	Birth Tourism (logged)	Authors
<i>GDP</i>	Average real GDP per capita (logged)	WDI
<i>CPI</i>	Consumer Price Index ($CPI_t = C_t/C_0 * 100$)	WDI
<i>IFM</i>	Number of Infant Deaths (logged)	WDI
<i>EXR</i>	Bilateral exchange rate of USD to NZD (ratio)	WDI
<i>CAAD</i>	The dummy variable represents the enactment of the Citizenship Act of 2005. Since the act became operational in 2006, we set the value 0 for the years before 2006 and the value 1 for the year 2006 afterward.	Authors

3.2. Data description and sources

In Table 1, we have provided a summarised description of the variables in the model and the data sources for each variable. Birth tourism is proxied by the number of newborn babies in New Zealand by parents who are neither New Zealand citizens nor permanent residents at the time of their birth. The data for birth tourism has been sourced from the International Travel and Migration Statistics of New Zealand. The real GDP series was sourced from world development indicators of the World Bank (2023) and it includes the average of the real GDP of the 15 countries that serve as key markets for tourism in New Zealand. Similarly, the datasets on the consumer price index (CPI), exchange rate, and the number of infant deaths have all been sourced from the world development indicators of the World Bank (2023). Lastly, the dummy variable capturing the Citizen Amendment Act, 2005 was computed by setting the value of zeros for the years preceding 2006 before the act became operational and setting the values of ones after 2006 when the Act became fully operational.

Table 2 shows the summary statistics of the variables in their raw forms. It is seen that computed real GDP per capita varies from a maximum value of US\$29,268.59 to a minimum value of US\$12,190.84. The mean GDP value stood at S\$20,759.48 while the median value is reported to be US\$21,087.04 indicating that median and mean values are close. This pattern is also reflected in the other series indicating that there is not much variation in the series and all the series have positive standard deviations. In terms of skewness, all variables are positively skewed apart from *GDP* and *CPI* which are negatively skewed. All the variables are also observed to be normally distributed as shown by the probability values of the Jarque-Bera statistics except for the *BT* variable which is seen not to be normally distributed. However, a logarithm transformation of the series made it to be normally distributed.

3.3. Estimation technique

Several econometrics techniques Johansen (1991) have been applied to investigate the dynamic interrelationships among variables. However, Pesaran et al.'s (2001) autoregressive distributed lag (ARDL) modelling technique is arguably the most preferred method due to its

Table 2. Summary statistics.

Statistic.	Variable				
	<i>BT</i>	<i>GDP</i>	<i>CPI</i>	<i>IFM</i>	<i>EXR</i>
Mean	160.929	20759.48	78.515	399.31	1.583
Median	117	21087.04	78.009	336	1.521
Maximum	495	29268.59	120.779	652	2.379
Minimum	42	12190.84	23.466	207	1.027
Std. Dev.	113.819	5589.646	26.695	129.234	0.290
Skewness	1.458	-0.047	-0.372	0.555	0.675
Kurtosis	4.359	1.636	2.244	1.940	3.313
Jarque-Bera	18.118	3.269	1.971	4.122	3.361
Probability	(0.0001)	(0.195)	(0.373)	(0.127)	(0.186)
Observations	42	42	42	42	42

many enviable qualities. Chief among these qualities is the fact that it is invariant to a mixed order of integrations among the variables. This implies that it allows the researcher to combine variables with different integrating orders in the same model – a leeway that is not obtainable with other techniques. The only proviso, however, is that none of the variables must be integrated of an order greater than 1 which will ensure that the series is not explosive and does not contain seasonal unit roots. In other words, if d is the integrating order, then the condition $d < 1$ must hold for ARDL to be applicable. Furthermore, Pesaran et al. (2001) have also argued that while producing consistent estimates with small sample sizes, estimates from the ARDL method are unbiased in the face of challenges posed by endogeneity as the short-run and long-run coefficients are simultaneously estimated through the error correction model (ECM).

Following Pesaran et al. (2001), the ARDL specifications for the baseline model in Equation (3) and the citizenship birthright adjusted model in equation (4) are respectively rendered as follows:

$$\begin{aligned} \Delta \ln BT_t &= \alpha_0 + \alpha_1 \ln BT_{t-1} + \alpha_2 \ln GDP_{t-1} + \alpha_3 CPl_{t-1} + \alpha_4 \ln NIFD_{t-1} + \alpha_5 EXR_{t-1} \\ &+ \sum_{k=1}^a \alpha_6 \Delta \ln BT_{t-k} + \sum_{k=1}^b \alpha_7 \Delta \ln GDP_{t-k} + \sum_{k=1}^c \alpha_8 \Delta CPl_{t-k} + \sum_{k=1}^d \alpha_9 \Delta \ln NIFD_{t-k} \\ &+ \sum_{k=1}^e \alpha_{10} \Delta EXR_{t-k} + \varepsilon_t \\ \Delta \ln BT_t &= b_0 + b_1 \ln BT_{t-1} + b_2 \ln GDP_{t-1} + b_3 CPl_{t-1} + b_4 \ln NIFD_{t-1} + b_5 EXR_{t-1} \\ &+ b_6 CAAD_{t-1} + \sum_{k=1}^a b_7 \Delta \ln BT_{t-k} + \sum_{k=1}^b b_8 \Delta \ln GDP_{t-k} + \sum_{k=1}^c b_9 \Delta CPl_{t-k} \\ &+ \sum_{k=1}^d b_{10} \Delta \ln NIFD_{t-k} + \sum_{k=1}^e b_{11} \Delta EXR_{t-k} + \sum_{k=1}^f b_{12} \Delta CAAD_{t-k} + \mu_t \end{aligned}$$

To establish cointegration, the contrasting null and alternative hypotheses of the existence or otherwise of cointegration in the combined significance of the lagged level estimates in Equations (5) and (6) are tested. In this instance, the calculated *F-statistics* are observed across two categories of critical values including the lower and upper critical bounds. Only when the calculated *F-statistics* are higher than the upper critical bound is cointegration proven to exist. The model is then put through a few diagnostic tests to determine its consistency and stability including the Breush and Godfrey Lagrange Multiplier (LM) test, the Jarque-Bera statistical test, and the ARCH and White tests which are respectively used to examine the model's serial correlation, normal distribution, and homoscedasticity. Finally, the model's stability is confirmed by looking at the plots of the cumulative sum and its squares.

Notwithstanding the admirable properties of the ARDL method relative to other estimation techniques, the dynamic version (DARDL) developed by Philips (2018) has proven to be a superior estimation technique for several reasons. First, Philips (2018) has shown that the conventional ARDL method is conservative when the sample size used for the analysis is less than 80 points. In other words, the DARDL estimation technique produces estimates that are superiorly robust for smaller data points of 80 or less. Secondly, the ARDL model is also said to be generally complex due to the inclusion of multiple lags, first differences, and lag first differences, which may make it difficult to interpret the impact of changes in the regressors on the regressand. In contrast, the DARDL is characteristically flexible and enables the simulation of multiple ARDL models before selecting the optimal model. Thirdly, as opposed to the approach of testing the hypothesis on the estimable parameters used in the ordinary ARDL technique, the dynamic simulation of the ARDL model employs a system of counterfactual scenarios to obtain the main results. Thus, dynamic simulation is an alternative approach that can simulate, estimate, and plot the counterfactual effects of the explanatory variables on the explained variable. The present study extends the

application of the dynamic ARDL simulation to explore the determinants of maternity tourism in New Zealand.

Consistent with Jordan and Phillips (2018), the error correction forms of the DARDL for the base-line model and the citizenship birthright adjusted model are stated respectively in equations (7) and (8) as thus:

$$\begin{aligned}\Delta \ln BT_t &= \alpha_0 + \alpha_1 \ln BT_{t-1} + \alpha_2 \Delta \ln GDP_t + \alpha_3 \ln GDP_{t-1} + \alpha_4 \Delta CPI_t \\ &+ \alpha_5 CPI_{t-1} + \alpha_6 \Delta \ln IFM_t + \alpha_7 \ln IFM_{t-1} + \alpha_8 \Delta EXR_t + \alpha_9 EXR_{t-1} + \varepsilon_t \\ \Delta \ln BT_t &= b_0 + b_1 \ln BT_{t-1} + b_2 \Delta \ln GDP_t + b_3 \ln GDP_{t-1} + b_4 \Delta CPI_t + b_5 CPI_{t-1} \\ &+ b_6 \Delta \ln IFM_t + b_7 \ln IFM_{t-1} + b_8 \Delta EXR_t + b_9 EXR_{t-1} + b_{10} \Delta CAAD_t + b_{11} CAAD_{t-1} + \mu_t\end{aligned}$$

The procedure is then implemented through a thousand repeated simulations. Three conditions must be satisfied for the estimated parameters generated through the DARDL to be valid. First, the dependent variable must be strictly integrated of an order of 1. The second condition is that none of the other remaining variables in the model must have an integrating order exceeding one. These conditions are validated through a reliable test of stationarity. The third condition for the simulation of the DARDL required that variables have long-run cointegrating relationships as established by the bounds test.

4. Empirical results, analysis, and discussion

In this section of the study, the empirical findings, analysis, and discussion are presented, focusing on key aspects of the research methodology and results. This section is divided into several subsections to systematically explore the unit root test results, long-run bounds test outcomes, dynamic ARDL simulation findings, and the simulated effect of counterfactual shocks of the Citizenship Amendment Act on the demand for birth tourism. Each subsection provides valuable insights into the stationarity properties of the time series data, the existence of long-run relationships among variables, the dynamic effects of explanatory factors on birth tourism demand, and the potential impact of legislative changes on this phenomenon.

4.1 Unit root test

We begin the report and discussion of the empirical exercise with the results of the unit root test. Like every other time series model, the dynamic ARDL is highly sensitive to the stationarity attributes of the series. First, the dynamic ARDL requires that the dependent variable must be strictly integrated into order 1 i.e. $I(1)$. Secondly, while a mixed integrating order of the variables is permissible, none of the variables must be integrated in an order exceeding 1. Conventional unit root tests such as the Augmented Dickey-Fuller (ADF) test and Phillips-Perron (PP) test have been widely used in the literature, but these tests may produce spurious results as they fail to account for breakpoints in the series.¹ Thus, we have adopted a unit root test with breakpoints to increase the power of the test and prevent any spurious results. The results of the breakpoint unit root test are presented in Table 3. The test is based on two specifications including the innovation outlier and the additive outlier. The innovation outlier specification results presented in panel A of Table 3 show that *BT* and *IFM* are integrated of order while the variables *GDP*, *CPI*, and *EXR* attained stationarity both at levels and after first differencing. However, the additive outlier specification presented in panel B of Table 3 shows that all variables attained stationarity only after the first difference except for only *GDP* which attained stationarity at both levels and after the first differencing. Importantly, it is noted that for both specifications, the dependent variable *BT* is strictly an $I(1)$ variable as stationarity is only attained after the differencing, and while mixed order of integration is reported in both the innovation outlier and additive outlier specifications, the maximum order of integration is 1. Thus, all conditions for the simulation of the dynamic ARDL procedure are satisfied.

Table 3. Breakpoint Unit Root Test: Dickey-Fuller min-t method.

Panel A: Innovation Outlier					
Variable	Level		First Difference		Stationarity Decision
	ADF test statistics	Break Date	ADF test statistics	Break Date	
<i>BT</i>	−3.871	2009[7]	−6.873 ^x	2000[1]	<i>I</i> (1)
<i>GDP</i>	−4.591 ^y	2006[0]	−7.345 ^x	1985[0]	<i>I</i> (0) & <i>I</i> (1)
<i>CPI</i>	−4.680 ^z	1984[0]	−4.671 ^z	1984[0]	<i>I</i> (0) & <i>I</i> (1)
<i>IFM</i>	−3.627	2021[2]	−5.240 ^x	2021[3]	<i>I</i> (1)
<i>EXR</i>	−4.279 ^z	2001[1]	−4.508 ^z	1998[0]	<i>I</i> (0) & <i>I</i> (1)

Panel B: Additive Outlier					
Variable	Level		First Difference		Stationarity Decision
	ADF test statistics	Break Date	ADF test statistics	Break Date	
<i>BT</i>	−3.711	2006[1]	−7.148 ^x	1998[1]	<i>I</i> (1)
<i>GDP</i>	−4.614 ^y	2006[0]	−7.577 ^x	1986[0]	<i>I</i> (0) & <i>I</i> (1)
<i>CPI</i>	−4.229	1984[0]	−4.910 ^y	1987[0]	<i>I</i> (1)
<i>IFM</i>	−3.233	2019[3]	−4.790 ^y	2021[3]	<i>I</i> (1)
<i>EXR</i>	−4.312	1999[1]	−4.594 ^y	1988[0]	<i>I</i> (1)

x, *y* and *z* represent significance at 1%, 5% and 10% level respectively. The maximum lag is set at 9 and the figures in brackets are the selected optimal lag length based on the Schwarz criterion.

4.2 Long-run bounds test results

The results of the bounds test undertaken to determine the possible existence of long-run relationships among the variables are shown in Table 4. To conclude on the existence or otherwise of a long-run relationship, the decision rule is that the computed *F-statistics* for the joined significant of all the lagged level variables is greater than the upper critical bounds known as the *I*(1). As shown in Table 4, the computed *F-statistics* of 4.823 exceeded the upper critical bound of 4.570 at the 5% level of significance, thus confirming that the variables have long-run cointegrating relationships. The diagnostics tests inclusive of the CUSUM and CUSUMSQ tests in Figures 1 and 2 show that the model is good and stable.

4.3 Results of the dynamic ARDL simulation

Following the confirmation of the existence of long-run cointegrating dynamics as established by the bounds test result in Table 4, the dynamic ARDL model is then simulated, and the results are presented in column A of Table 5. Beginning with the baseline model, the short-run dynamics show that the parameter estimates for *GDP*, *CPI*, *IFM*, and *EXR* are respectively 3.042, −0.099,

Table 4. Summary of bound test cointegration results.

Model: $F_{mt}(\text{BT/GDP, CPI, IFM, EXR})$		
Optimal lags	(4, 4, 3, 2, 1)	
<i>F-Statistics</i>	4.823 ^y	
Lower bound <i>I</i> (0)	3.470	
Upper bound <i>I</i> (1)	4.570	
Level of significant	5%	
R^2	0.94	
Adjusted- R^2	0.84	
Diagnostic tests		
Jarque-Bera	0.3624	[0.834]
Breusch-Godfrey LM Test:	0.3945	[0.681]
Breusch-Pagan-Godfrey:	0.7383	[0.744]
ARCH	0.9987	[0.325]
White	1.0233	[0.486]
Harvey	1.1942	[0.359]

Notes: The optimal lag length is based on the Akaike Information Criterion. The specified model is unrestricted constant and unrestricted trend. $K = 4$. *y* represents a 5% level of significance.

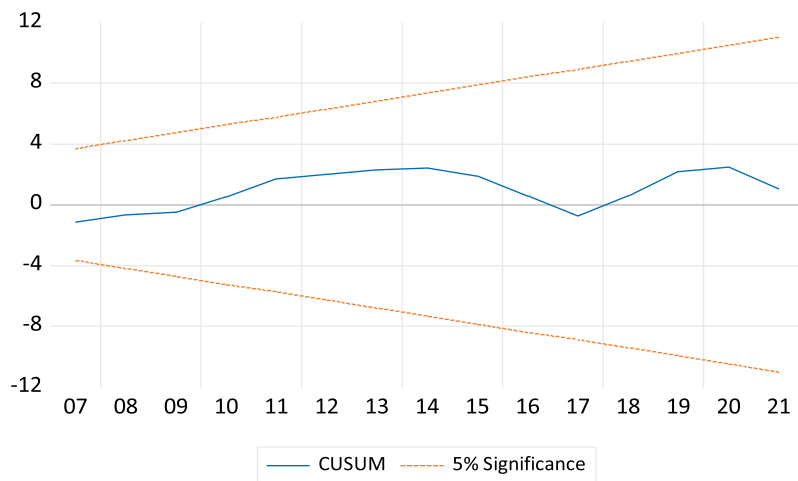


Figure. 1. Plots of the cumulative sum (CUSUM).

–1.476, and –0.111. The regressors except *EXR* have signs that conform with the *a-priori* expectation. However, in the long-run, the parameter estimates are found not only to be significant, but their signs also conform with *a-priori* expectations. The only exception to this is *IFM* whose sign is in variance with expectation. This result implies that *GDP*, *IFM*, and *EXR* have long-run positive effects on *BT* while the impact of *CPI* on *BT* is negative. This result is consistent with rational expectations as an increased *GDP* implies enhanced purchasing power of maternity tourists which increased their ability to afford the cost of medical tourism. Similarly, *CPI* is a cost factor such that an increased *CPI* implies an increase in the cost of medical tourism which makes it less affordable for maternity tourists to assess maternity tourism. *EXR* represents how much New Zealand dollars can be obtained per USD, thus the higher the amount of New Zealand dollars that can be obtained per USD the more affordable maternity tourism will be for maternity tourists, thus the significantly positive estimate of *EXR* is consistent with *a-priori* expectation. *IFM* is the number of infant deaths and is hypothetically expected to have a negative impact on maternity tourism as maternity tourists are expected to be

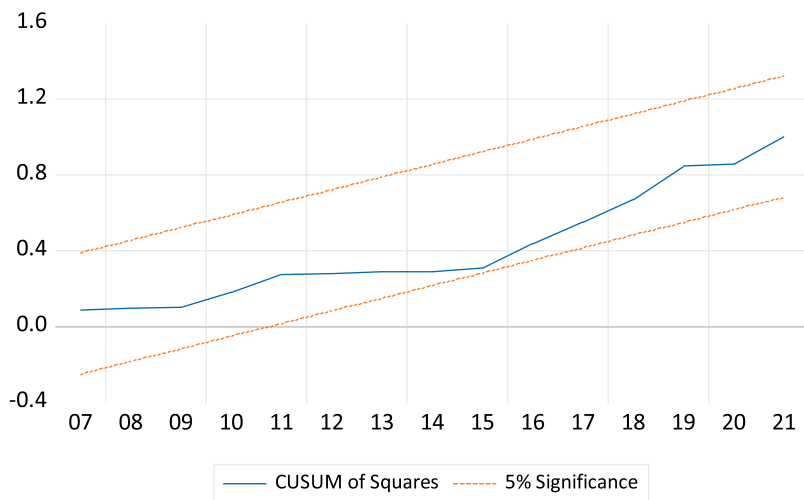


Figure 2. Plots of the cumulative sum of squares (CUSUMSQ).

Table 5. Results of dynamic ARDL simulation.

Explanatory variables	A	B
	Baseline model	Citizenship Amendment Act adjusted model
	Short-run	Short-run
$\Delta \ln GDP_t$	3.042 [1.14]	2.534 [0.92]
ΔCPI_t	-0.099 ^x [-2.58]	-0.101 ^y [2.52]
$\Delta \ln NIFD_t$	-1.476 [-0.37]	-2.830 [-0.67]
ΔEXR_t	-0.111 [-0.33]	-2.203 [-0.58]
$\Delta CAAD_t$	-	0.245 [0.65]
	Long-run	Long-run
$\ln MT_{t-1}$	-0.344 ^x [-2.59]	-0.351 ^y [-2.27]
$\ln GDP_{t-1}$	6.062 ^z [1.86]	6.885 ^z [1.81]
CPI_{t-1}	-0.038 ^z [-1.83]	-0.041 ^z [-1.89]
$\ln NIFD_{t-1}$	2.320 [1.63]	2.731 [1.66]
EXR_{t-1}	0.636 ^x [2.69]	0.629 ^y [2.53]
$\Delta CAAD_t$	-	-0.079 [-0.27]
Constant	-70.014 ^z [-1.8]	-80.297 ^z [-1.78]

Notes: Bracketed figures are the t-statistics. x signifies a 1% significant level; y signifies a 5% significant level, and z signifies a 10% significant level. The model is simulated 5000 times across 42 time points.

discouraged if a high number of infant deaths is reported in a potential tourism destination. However, contrary to *a-priori* expectation, a negative coefficient is reported for *IFM*, although this is found to be insignificant implying that tourists do not consider infant mortality as a strong factor when making the decision on maternity tourism. Income, price, and cost are more important factors of consideration when making decisions on maternity tourism.

In 2005, the New Zealand government introduced the Citizenship Amendment Act 2005. Consequently, a Citizenship Amendment Act 2005 adjusted model has been estimated to account for the possible effect of the Citizenship Amendment Act 2005 on the estimates generated from the baseline model, and the generated results are presented in column B of Table 5. Beginning with the short-run analysis, we see that the results are not materially different from the results of the baseline model. It is noted that of all the regressors, only *CPI* has a statistically significant effect on *BT* in the short run. However, the result of the dummy for the Citizenship Amendment Act 2005 is not significant and did not alter the behaviours of the parameters in the baseline model.

In the same vein, the long-run dynamics in the Citizenship Amendment Act 2005 adjusted model is not materially different from the baseline model. It is also noted that the *GDP*, *CPI*, and *EXR* are all statistically significant with expected signs while *IFM* reported a sign different from *a-priori* expectation but it's generally non-significant. Importantly, the coefficient of the dummy for the Citizenship Amendment Act 2005 turns out to be insignificant.

4.4 Simulated effect of counterfactual shocks of the Citizenship Amendment Act on the demand for birth tourism

A profound attribute of the dynamic ARDL procedure is its capacity to project the predicted effects of the counterfactual shocks to an independent variable of interest on the dependent variable. In this instance, our interest is to determine the counterfactual effects of the child amendment act on the demand for maternity tourism in New Zealand. The non-significant effect of the Citizenship Amendment Act on the demand for maternity tourism in New Zealand is further expatiated by the result of the predicted effect of its counterfactual shocks on maternity tourism which is presented in Figures 3 and 4. The figures show the positive and negative impacts of a unit standard deviation shock of the Citizenship Amendment Act on the demand for maternity tourism in New Zealand. From the plots in Figures 3 and 4, it is seen that the respective positive and negative shocks of the Citizenship Adjustment Act occurring at point 27 only caused a slight nudge in the dependent variable which almost immediately settled to a long-run equilibrium without any substantial alteration to its trajectory path.

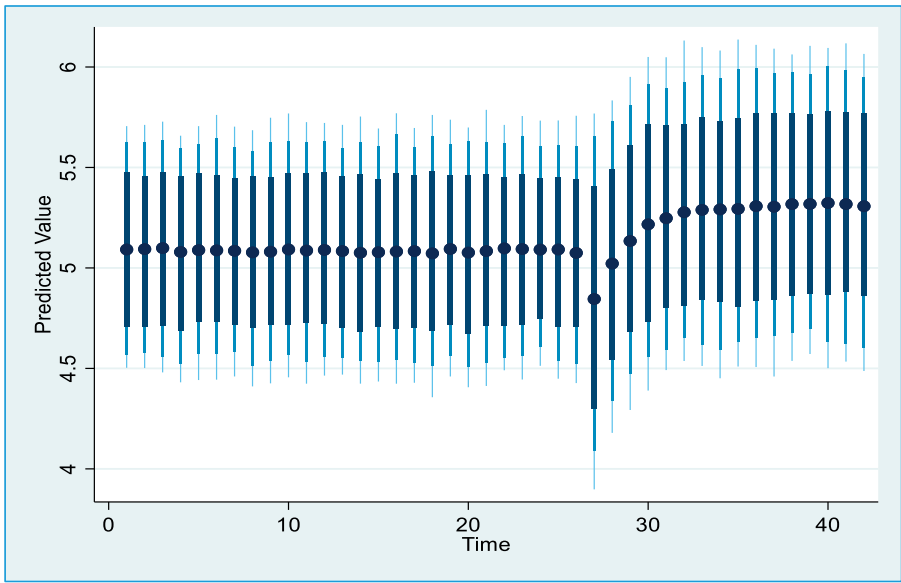


Figure 3. The predicted positive impact of one standard deviation counterfactual shock to Citizenship Amendment Act at $t = 27$. The dark-blue dotted spots are the values of the predicted mean. The 95%, 90%, and 75% confidence intervals are represented by the blue lines from light to dark.

5. Discussion of the results

The foregoing results suggest that income which is proxied by GDP exerts a significant and positive impact on the demand for maternity tourism in New Zealand. This implies that all things remaining constant, an increase in the income of maternity tourists will promote maternity tourism in New

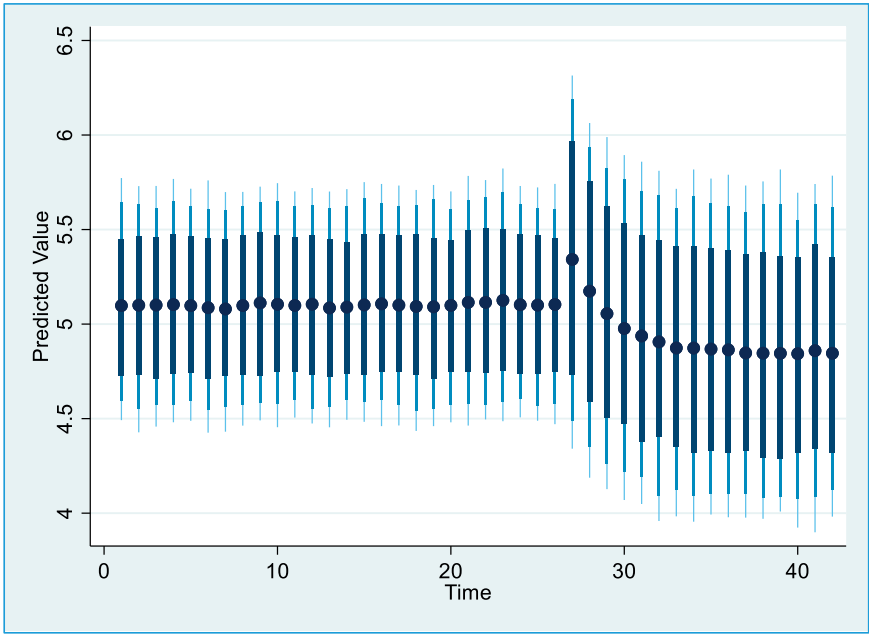


Figure 4. The predicted negative impact of one standard deviation counterfactual shock to the Citizenship Amendment Act at $t = 27$. Check [Figure 3](#) for other details.

Zealand. The results are not surprising as they agree with the outcomes of some extant empirical studies on tourism literature including Choi and Lai (2022). One possible rationale to explain the observed impact of GDP on maternity tourism is its nature as a normal good. Maternity tourism is seen as any normal good whose demand is a positive function of income such that the higher the income, the higher the purchasing power which ultimately transfers to higher demand. Many of the major source countries in New Zealand are either high-income countries including Australia and Singapore, or upper-middle-income countries such as China and Malaysia. It is thus unsurprising that an increase in GDP will have a strong positive effect on the demand for maternity tourism in New Zealand. Prior to the breakout of the Covid-19 pandemic, tourism was the largest export industry in New Zealand (Tourism New Zealand, 2023). This explains why major marketing activities in tourism are targeted at these high-income countries to boost the country's tourism industry, which by extension impacts maternity tourism positively.

While GDP is reported to have significant and direct interaction with maternity tourism, CPI, on the other hand, is reported to be inversely related to maternity tourism. This suggests that all things being equal, an increase in CPI in New Zealand will result in a decrease in maternity tourism. Again, this result also conforms with *a-priori* expectations as CPI is treated as the price or cost of maternity tourism such that an increase in CPI will increase the cost of assessing maternity tourism which will then lead to a reduction in demand. The demand for maternity tourism is a function of affordability such that an increase in cost will reduce the affordability for consumers. The result is generally in agreement with extant tourism studies such as Arshad et al. (2023).

With regards to the IFM, the outcome is at variance with *a-priori* expectations. It is normally expected that an increase in infant mortality should deter foreigners from coming to New Zealand for maternity tourism, and as such a negative relationship is expected instead of the reported positive relationship. It is however noticed that this relationship is largely not significant. The probable explanation for this is that the rate of infant mortality in New Zealand has been experiencing a constant decline over the past four decades. Within the sample frame of the current study, the number of reported infant deaths per year in New Zealand has declined by more than two-thirds from 652 in 1980 to 207 in 2021. Thus, tourists are not bothered to have their babies in New Zealand as the probability of losing their newborns is rare. The empirical findings also suggest that favourable exchange from the viewpoints of the tourists will improve the level of maternity tourism. Again, this is to be expected as the higher the exchange rate relative to the US dollars, the higher the amount of New Zealand dollars that can be obtained by tourists per US dollar. This implies that the more the New Zealand Dollars that can be obtained per US dollar, the greater the ability of foreigners to afford the cost of maternity care in New Zealand.

The results also suggest that the introduction of the Citizenship Adjust Act in 2005 does not have any significant influence on the demand for maternity tourism in New Zealand. The implication of the Act is that children born to parents who are neither citizens nor permanent residents in New Zealand could no longer enjoy the full birthright citizenship that used to be in place before the enactment of the act. One reason for this is that what motivates foreigners to have their newborn babies is not primarily because of citizenship acquired by birthright. The reason for this is not far-fetched as the major sources of tourism market for New Zealand are from countries in the categories of high-income and upper-middle income countries. Citizens of these countries are comfortable and are not interested in acquiring citizenship in another country. Rather monetary and financial considerations such as income, price, and cost are the primary factors that determine the demand for maternity tourism in New Zealand.

6. Conclusion

The current study seeks to underpin the root cause for the demand for birth tourism in New Zealand. Using a standard tourism demand framework, we have considered factors such as average income of visitors, price level, exchange rate, infant mortality and the introduction of the Citizenship

Amendment Act 2005 in New Zealand. With the use of a recently introduced dynamic ARDL simulation estimation method, the results show that rising income of visitors and exchange rate boost birth tourism while rising price reduces birth tourism. Rising income of visitors appears to be the strongest factor for birth tourism in New Zealand, which indicates that demand-side factors appear to be stronger than supply-side factors. The empirical findings are largely consistent with the results in Choi and Lai (2022), which is the sole paper that is observed to have focussed on the determinants of birth tourism. The result of the simulated counterfactual shock also shows that the implementation of the Citizenship Amendment Act 2005 has no significant effect on birth tourism. The Citizenship Act of 2005 governs New Zealand citizenship acquisition. The Act prioritises citizenship by birth, descent, adoption, and naturalisation, but it also addresses birth tourism and maternal citizenship. The New Zealand economy has also suffered from maternity tourism. Concerns over birthright citizenship misuse have drawn attention to this practice in several countries, notably New Zealand. New Zealanders born in the country immediately become citizens under the Citizenship Act of 2005. *Jus soli*, or citizenship by birthright, applies in New Zealand, so those born there are usually citizens regardless of their parents' citizenship status. The Citizenship Act limits birthright citizenship abuse by discouraging birth tourism. A child born in New Zealand must have at least one parent who is a citizen or permanent resident to automatically become a citizen under the Act. The condition prevents birthright citizenship from being used primarily for New Zealand citizenship.

The Act also addresses the fraudulent acquisition of citizenship by misrepresentation or deception. These rules protect New Zealand's citizenship process and prevent abuse. The Citizenship Act of 2005 in New Zealand maintains birthright citizenship but contains provisions to avoid birth tourism and fraudulent citizenship acquisition. These laws balance New Zealand's citizenship principles of inclusion with integrity. Therefore, the development of birth tourism in New Zealand, especially since the Citizenship Amendment Act 2005 can be partly considered to have been a planned action.

From a policy perspective, the present study affirms the assertion that birth or maternity tourism is a normal good. This proposition is corroborated as income level measured by GDP increases demand for maternity tourism from a potential mother. Furthermore, the plausible logic for this outcome is that a higher income level in foreign countries is required for the demand for maternity tourism in New Zealand to increase. Marketing efforts focusing on countries with higher income should yield greater birth tourism and possibly add to the possibility of achieving an objective of the *New Zealand-Aotearoa Government Tourism Strategy* of 2019. The price to access maternity tourism shows an inverse relationship with demand for birth tourism. These results imply the need for more affordable services in birth tourism.

The results on the effect of infant mortality suggest the health indicator is not sufficient to deter potential mother to New Zealand. Thus, there is a need for stakeholders to focus on a healthcare ecosystem that supports balance in sustainable healthcare in line with the United Nations Sustainable Development Goals (UN-SDGs-3). The impact of the Citizenship Act in 2005 failed to distort the demand for birth tourism. Thus, there might be a need to revisit the act in view as it remains inelastic with the current New Zealand dynamics.

In summary, the present study revisits the tourism-demand model while deviating from the conventional tourism demand model. The present study modelled the maternity tourism demand in New Zealand while accounting for key determinants of tourism such as exchange rate, price proxied by CPI and mainly accounting for governmental act or regulation to tourism demand. In the represent study case the role of the Citizenship Act of 2005 is to demand tourism in the study area. The key findings are highlighted as: Maternal or birth tourism is a normal good as increase in both consumer price and income level increases the demand of birth tourism flow into the country. While exchange rate and infant mortality did not serve as limiting factors to birth tourism in New Zealand.

Finally, the study submits that both monetary and health-related indices play a pertinent role as drivers for maternal tourism in New Zealand over the period investigated while leveraging on the

standard tourism demand ideology. From the study results there is a need for a revamp of the New Zealand immigration policies, healthcare management, and other immigration strategies as the updated Citizenship Act fails to support the assertion that potential mothers solely pursue birth tourism for nationality purposes. Although, the present study explored determinants of birth tourism for New Zealand as it captures both health and monetary-related factors in a simple demand function. There is a need to capture other indices not accounted for in the present study such as institutional indices like the rule of law, and administrative red tape among others for future studies as a direction for other scholars on the theme to either refute or validate our study position. Nevertheless, the results of this study can be generalised to other birth tourism destinations in the world, especially the developed countries. This is because, like New Zealand, birth tourism is still low relative to the contribution of other forms of tourism (such as business tourism and educational tourism) in many developed countries. Similar to the situation New Zealand, some developed countries have updated their citizenship laws in the first and second decades of the twenty-first century, following the 11 September 2001 attacks on the United States.

Building on the findings of this study, future research could explore various avenues to deepen our understanding of birth tourism dynamics and inform policy and business decisions. One potential direction is to investigate the influence of additional socio-demographic factors, such as education level, marital status, and cultural preferences, on birth tourism demand. This would provide a comprehensive understanding of consumer behaviour in this niche market by uncovering the nuanced motivations behind birth tourism. Additionally, conducting comparative studies across different countries could shed light on variations in birth tourism trends and identify commonalities or differences in determinants across diverse socio-economic contexts. By undertaking longitudinal studies, researchers could track changes in birth tourism patterns over time and assess the long-term impact of policy interventions and economic fluctuations on birth tourism demand. Complementing quantitative analyses with qualitative research methods, such as interviews and focus groups, would allow for a deeper exploration of the motivations and experiences of birth tourists and stakeholders in the tourism and healthcare sectors. Finally, evaluating the effectiveness of existing policies and regulations governing birth tourism would provide valuable insights into areas for improvement and inform evidence-based policy reforms aimed at managing this phenomenon more effectively.

Note

1. We have not reported the results of the conventional unit root test in order to conserve space.

Disclosure statement

No potential conflict of interest was reported by the author(s).

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