



Research Article

Estimating the Economic Impact of the Office for Competition on the Maltese Economy

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Abstract. The Office for Competition in Malta is the leading administrative competition authority responsible for promoting sound competitive practices for attaining and maintaining well-functioning markets. This study quantifies the economic benefits on the Maltese economy via an economic impact assessment for the designated roles of the Office for Competition. Through an application of time-series econometrics, input-output modelling framework and the OECD's guidelines to conduct such assessments, this study explores the direct and indirect multiplier effects that accrued on the Maltese economy as a result of the Office's control of concentrations activities between 2014 and 2018. This study finds that the estimated financial benefit to the Maltese economy in terms of GDP averaged €10.2 million per year, €7.1 million in direct effects and €3.1 million in indirect benefits. This equates to a direct benefit-to-costs ratio of 30.4:1. This study should aid Maltese authorities in gauging the rate of return from the annual budget allocated to the Office for Competition and increase awareness of the benefits of competition law and policy.

Keywords: competition, input-output, economic impact, Malta

1 Introduction

By preserving a sound competitive environment, competition policy leads to many benefits for society – lower consumer prices, allocative and productive efficiency, product variety, better quality, and entrepreneurial innovation. These benefits do not arise because firms are altruistic benefactors but rather because of their pursuit of profit maximisation within a competitive environment. The presence of rival undertakings in the same market striving for the same goal leads them to develop and produce products that customers want to buy while attaining cost

efficiency. These benefits are often attributed to the utopian paradigm of perfect competition, wherein many small firms are subject to market-imposed conditions. Sometimes, even a limited number of market players can attain such benefits as long as no adverse practices undermine competition. Even in highly concentrated contestable markets, the threat of 'hit-and-run' market entrants is enough to prevent firms from increasing their prices. Competition should therefore be regarded as a means to increase consumer welfare.

Although competition law is rarely contested, it is not straightforward to demonstrate how and to what extent competition policy contributes to the welfare of society. Although competition can be a positive-sum game, there are instances where competition makes a consumer or a producer worse off. On the demand side, not all consumers may be served by competitive markets for reasons of affordability or negotiation power. On the supply side, the market's playing field is rarely level, and while market opportunities for aspiring entrepreneurs exist, these are usually gobbled up by large companies enjoying economies of scale and better access to finance who are usually first entrants.

While the fate suffered by losers is unpleasant, competition policy aims to protect and promote sound competitive practices, not individual competitors. Competition authorities that over-emphasise the importance of fair play may mislead small businesses and consumers into thinking that competition policy ensures a level playing field and a fair market outcome. Rather, the aim of competition authorities is to promote sound competitive practices to further the attainment and maintenance of well-functioning markets for the benefit of consumers and economic operators.

Against this background, this study estimates the return ratio for Malta's Office for Competition (hereinafter referred to as "the Office") in terms of its contribution

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to the Maltese economy during the 2014–2018 period for its control of concentrations activities. The return ratio relates to the implementation of competition law and policy as administered by the Office for Competition and not to the Office for Competition *per se*. The return ratio is based on direct and indirect output multipliers in an input-output modelling framework. Similar exercises have been carried out by the Competition and Markets Authority (CMA) in the UK to justify the budget allocated to it for competition policy.

This article is organised in five sections as follows. Section 2, which follows this introduction, briefly reviews the literature and presents the context of this study, particularly the work conducted by the Office between 2014 and 2018. Section 3 provides a detailed description of the methodology adopted. Section 4 presents the estimated impacts. Section 5 concludes by presenting the key learning outcomes and the caveats of the study.

2 Literature Review

The effect of competition policy on macroeconomic performance can be conceptualised in terms of changes in allocative, productive, and dynamic efficiency (Ilzkovitz & Dierx, 2015). First, a successful competition regime facilitates the entry of new firms and the exit of the least efficient firms, thus restraining the market power of incumbents through the presence of more efficient firms (allocative efficiency). Second, firms are compelled to utilise their resources most efficiently to thrive and survive the price and cost competitive pressures, ultimately constraining firms to operate at the minimum point of their long-run average cost curves (productive efficiency). Third, competition stimulates firms to differentiate themselves in the marketplace through innovation and the development of new products, hence maintaining their competitive edge (dynamic efficiency). The latter positive spill-over effects are generally contested because firms are unlikely to invest in research and development if they are prevented from protecting the returns to their investment through, for example, the imposition of barriers to entry.

Studies on competition authorities distinguish between tangible and intangible effects (García-Verdugo et al., 2017; Ilzkovitz & Dierx, 2015). Tangible effects refer to interventions by authorities, such as concentration controls, which prevent situations from arising that would substantially reduce competition, such as higher prices because of fewer firms operating in the market. The effects of interventions focus on specific cases, activities, and industries. The results are generally published as a two- or three-year moving average in order to smooth out the high volatility of low and high prices between years. Intangible effects are generally composed of productivity, innovation

and growth effects, and the deterrent effects associated with interventions by the authorities.

The operation of competition authorities not only safeguards competitive markets with trickle-down effects on consumers but also discourages other companies from committing infringement or abuse of market power. For example, competition law has been found *inter alia* (i) to increase the number of firms and lower the mark-up in the market (Kee & Hoekman, 2007); (ii) to enhance total factor productivity (Borrell & Tolosa, 2008; Buccirossi et al., 2008, 2013) with some finding inconclusive effects (Ma, 2011; Voigt, 2006, 2009); and (iii) to boost GDP (Clougherty, 2010; Gutmann & Voigt, 2014; Petersen, 2013). Though the literature underlines that intangible effects associated with cartel enforcement far outweigh the tangible benefits, the literature has not yet provided precise estimates of the effect of anti-cartel policies. Yet, there are reasonable grounds for believing that good cartel enforcement might deter more than 50% of the potential harm for cartels (Competition & Markets Authority, 2015, 2017). While the existing literature acknowledges the significant deterrent effects of competition policy enforcement, no established methodologies for measuring intangible effects exist. An overarching consensus is that direct impact assessments underestimate the overall effectiveness of competition authorities.

Competition authorities conducting impact assessments do so for different reasons, quantifying the value of their work to present to the public and the Government as the most cited advantage. Usually, these impact assessments are also included in the annual reports. In April 2014, the OECD (2014) published guidance on assessing the expected impact of activities undertaken by competition authorities. The OECD recommended that to be comprehensive, an impact assessment should (i) include the impact of all decisions relating to blocked mergers, mergers approved with remedies and cartels, (ii) cover all the decisions listed above taken over the course of the previous year/s, and (iii) account for the benefits accrued to consumers.

3 Context

The Malta Competition and Consumer Affairs Authority Act (Chapter 510 of the Laws of Malta) prescribes a number of duties to be carried out by the Office. Some of the key responsibilities include: investigating anti-competitive conduct and instituting court proceedings before the Civil Court; examining and controlling concentrations between undertakings in terms of their effect on the structure of competition on the market; studying markets and recommending action where necessary; encouraging undertakings to comply with competition law and promoting sound

competitive practices; and providing advocacy to the Government of Malta on matters related to competition law.

During 2014 and 2018, the Office undertook several investigations and recorded a number of concentration decisions. Based on the Annual Reports for these years, the Office undertook the following:

- Twenty-nine (29) concentration decisions, of which one proposed concentration was terminated after the involved parties were unable to propose commitments that satisfy the MCCA's requirements;
- Five enforcement decisions, including interim measures on companies operating within the insurance sector and issued a commitment decision in the school uniforms retail market;
- Two investigations, one on school transport fees and one on the fuel sector;
- Acted as an advocate of competition law on five different occasions;
- Conducted a sector inquiry on the interest rates charged on loans to small- and medium-sized enterprises; and
- Assisted the Civil Court in proceedings involving competition matters.

Looking at sectoral data (Figure 1), the sector that featured the most in the Office's work is wholesale and retail trade, repair of motor vehicles and motorcycles, transportation and storage, accommodation, and food services activities sector. It accounted for nearly one-fourth of all the Office's decisions during the period under consideration, which is broadly the share of the sector of total Gross Value Added (GVA) in Malta. The second highest is the professional, scientific, and technical activities, administrative and support services activities sector at 22.8%, followed by the financial and insurance activities sector at 14.8%. The arts, entertainment and recreation sector accounted for the lowest share (4.6%) of the Office's decisions, while no cases involved parties within the agriculture and fishing sector, the construction sector, mining and quarrying, or the utility sector.

4 Methodology

Many competition authorities often publish assessments of the overall impact of their decisions. The objective of these assessments is to quantify in a simple and concise manner the expected benefits from the decisions on mergers and antitrust infringements, amongst others. These assessments differ from an ex-post evaluation of decisions that some competition authorities also undertake. An ex-post evaluation involves an assessment of the actual effects observed after the decision has been made. Since competition decisions usually require some time to produce the desired results, this implies that ex-post eval-

uations can identify and assess the actual effects they generate. On the other hand, it should be noted that impact assessments are undertaken after the decision has been made. As a result, the magnitude of their estimated impact will be highly contingent on the assumptions employed.

4.1 Results

In line with the OECD recommendations and to produce estimates of the economic impact in terms of Gross Value Added (GVA) from both the direct and indirect role of the Office, this study employs the input-output modelling framework. The input-output modelling framework enabled the authors to decompose the total economic impact between the direct and indirect effects.

The input-output modelling framework used in this study is the Leontief demand-driven model (Miller & Blair, 2009) based on the symmetric input-output table (SIOT) for Malta published by the NSO in 2016 for the reference year 2010. This study employs a 17-sector-by-sector SIOT, following the NACE Rev. 2 industry classification.¹ By breaking down the economy into finer units (sectors), input-output techniques are able to trace out undetected effects in traditional macroeconomic analysis that relate to the changes of aggregate variables rather than the effect of these changes on the composition, across the various sectors of the aggregate variable.

The solution to the Leontief demand-driven model, expressed in matrix algebra notation, is expressed below in equation (1):

$$\vec{x} = (I - A)^{-1} \cdot \vec{f} \quad (1)$$

where \vec{x} is a column vector representing the level of output for each n sector in the economy, $(I - A)^{-1}$ is the Leontief inverse and \vec{f} is a column vector representing the level of final demand for each n sector in the economy.

The elements within the Leontief inverse matrix incorporate the notion that increases in final demand have a larger impact on the production of output than solely the initial additional output produced (direct production effects) required to supply the exogenous increase in fi-

¹The 17 sectors are the following: (1) Agriculture, Forestry and Fishing; (2) Manufacturing; (3) Electricity, Gas, Water Supply and Waste Management; (4) Mining, Quarrying and Construction; (5) Wholesale and retail trade; repair of motor vehicles and motorcycles; (6) Transportation and Storage; (7) Accommodation and Food Service Activities; (8) Information and Communication; (9) Financial and Insurance Activities; (10) Real estate activities; (11) Professional, scientific and technical activities, and administrative and support service activities; (12) Public Administration and Defence; (13) Education; (14) Human Health and Social Work Activities; (15) Arts, Entertainment and Recreation; (16) Other Service Activities; and (17) Households as employers and activities of extraterritorial organisations.

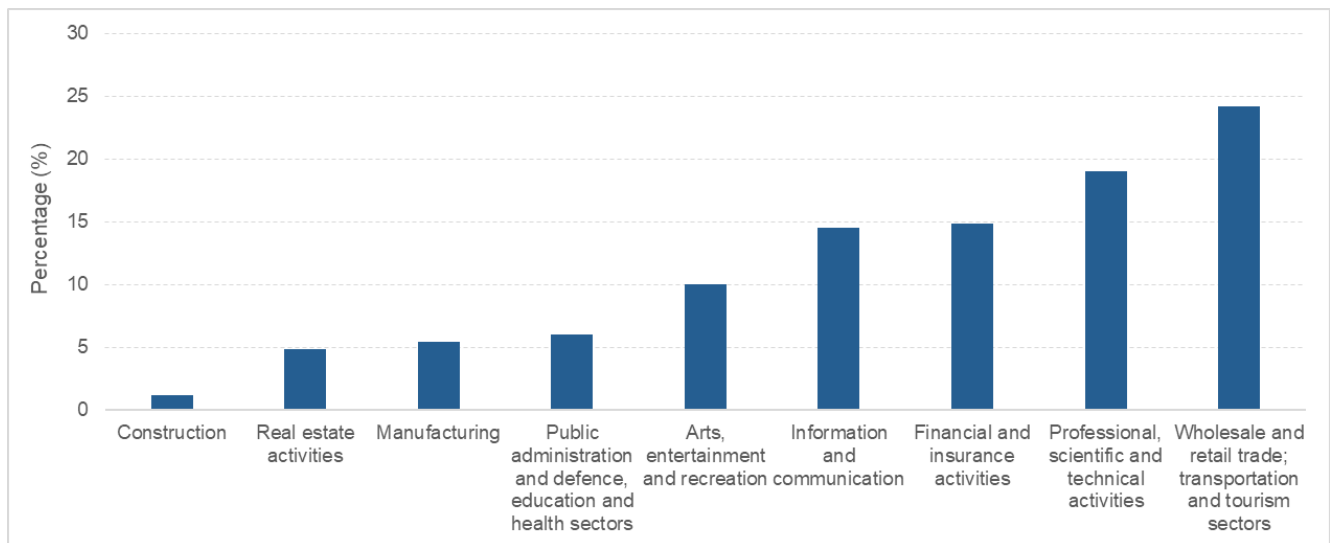


Figure 1: Decisions of the Office for Competition by Sector - January 2014 to December 2018. Source: MCCA; Authors' Calculations.

nal demand. The Leontief inverse thus incorporates the concept that the production process required to produce a unit of output for use by final demand, also requires the production of output by other industries for use as intermediate inputs. Furthermore, the production of these additional intermediate inputs requires subsequent increased rounds of production since output has to be produced to satisfy the second round of input requirements. All these rounds of additional increases in output are referred to as the indirect production effects of an exogenous increase in final demand on total output production.

Given that the aim of this study is to assess the economic impact of the Office on the Maltese economy, value-added multipliers were derived as these put forward a more representative measure of the economic impact effects on GDP. The value-added multipliers for the respective n sectors in the economy were obtained following 2, (expressed in matrix algebra):

$$\bar{s}\bar{v}' = \bar{u}' \cdot (I - A)^{-1} \quad (2)$$

where $\bar{s}\bar{v}'$ is a row vector of sectoral simple value-added multipliers, $\bar{s}\bar{v}'$ is a $(1 \times n)$ row vector of value-added / output coefficients (the amount of value-added generated per euro of output produced), and $(I - A)^{-1}$ is an $n \times n$ matrix representing the Leontief inverse.

The resulting simple value-added multipliers illustrate the effect of an additional euro of final demand for the output of the respective sector, when all of the direct and indirect effects in the production process are converted into a euro estimate of new value-added generated.

Simple value-added multipliers, reflect only direct and indirect effects on value-added caused by exogenous

changes to final demand. These estimates, however, omit the notion that increased production requires more labour input which in turn increases household income which further increases demand and consequently, more production. Households' income-expenditure behaviour is thus not endogenised within the derivation of these multiplier estimates. Within input-output literature, total output multipliers are generally referred to as multipliers obtained from a closed Leontief demand-driven model (Cassar & Rapa, 2018). The term *closed* relates to the fact that the technical coefficients matrix is closed with respect to household income-expenditure, and behaviour is endogenised within the economic system. Total multipliers capture the inter-relationships between revenue, income, and expenditure flows made by households and the productive sector. These multiplier estimates acknowledge the fact that an increase in demand for a sector's output has a greater impact on the economy than just the direct effects since there are wider knock-on effects on other industries.

In simple terms, this means that if there is an increase in the final demand for a particular product, we can assume that there will be an increase in the output of that product, as producers react to meet the increased demand (direct effect). As these producers increase their output, there will also be an increase in demand on their suppliers and so on down the supply chain (indirect effect). As a result of the direct and indirect effects, the level of household income throughout the economy will increase mostly due to increased employment. A proportion of this increased income will be re-spent on final goods and services (induced effect). The ability to quantify these multiplier effects is important as it allows economic impact analysis

to be carried out. The resulting total value-added multipliers illustrated in equation (3) below, now also include the induced effects:

$$\vec{t}V' = \vec{u}' \cdot (I - H)^{-1} \quad (3)$$

where $\vec{t}V'$ is a $(1 \times n)$ row vector of sectoral total value-added multipliers, \vec{u}' is a $(1 \times n)$ row vector of value-added / output coefficients, and $(I - H)^{-1}$ is an $(n \times n)$ Leontief inverse for the n productive sectors obtained following the endogenization of household income-expenditure behaviour. It is noteworthy that Oosterhaven, Piek and Stedler (1986) assert that a realistic estimate of the effective multiplier effect of a sector lies approximately halfway between the simple and total multipliers. This assertion was put forward on the basis that generally, simple multipliers tend to underestimate the economic impacts (since they omit labour income and household activities), whilst total multipliers tend to overestimate these impacts due to the rigid assumptions employed regarding the behaviour of household income-expenditure patterns. Given the underlying scope and goals of this study, the estimation of the impact on value-added arising from the operations of the Office shall be taken as the average between the simple and the total value-added multiplier effects (Oosterhaven et al., 1986). The average value-added multipliers employed for this study were obtained by following equation (4):

$$\vec{a}V' = (\vec{t}V' + \vec{s}V')/2 \quad (4)$$

where $\vec{a}V'$ is a row vector of the average value-added multipliers.

4.2 The Direct Economic Effects

Due to various underlying data constraints, only concentration decisions were considered for estimating the direct economic impact of the Office. The disclosure of confidential data by the Office enabled the authors to allocate each concentration decision to a particular economic sector and obtain an estimate of the total turnover of the concentration decision.

The following assumptions were employed to determine the estimate of the direct economic benefit resulting from each concentration decision:

- the concentration decision has an initial impact only on the NACE sector of the acquiring party²,
- the growth in market turnover of the acquiring party (aggregate turnover) for the year the concentration decision was undertaken and the following two years

²Concentration cases which involved financial intermediaries acquiring firms operating in the real economy retained their respective NACE allocation.

(for 2014, 2015 and 2016)³ is assumed to be the direct benefit of the concentration decision undertaken by the Office,

- the growth of the entire NACE sector is applied as a proxy for the growth rate in the aggregate turnover of the respective acquiring party, and
- the change in sectoral market turnover is assumed to be completely allocated to final demand.

On the basis of the following assumptions, the direct economic effect is equated to be equal to the change in aggregate market turnover of the acquiring party (dMA). In turn, this is equal to the market aggregate turnover of the acquiring party (TR_a) multiplied by the average sectoral growth rate over the years (year when the decision was taken plus two years after) (Gr_{avg}) (equation (5)).⁴ This exercise was undertaken for each concentration decision between 2014 and 2018.

$$dMa = TR_a \cdot Gr_{avg} \quad (5)$$

The final step involves multiplying the annual assumed change in the market turnover of each specific sector by the sectors' own average value-added multiplier (equation (4)) as shown in equation (6):

$$DIR_t = \sum_{i=1}^n dM_i \cdot av_i \quad (6)$$

where DIR_t is the impact in terms of value added of the direct effect of the Office for the respective year t , dM_i is the change in aggregate market turnover of the i th sector, and av_i is the average value-added multiplier of the i th sector.

Repeating this calculation across all the sectors which were affected by the Office's operations in that year and summing the resulting effects would yield the yearly estimate of the benefit to the economy in terms of GVA as a result of the direct interventions of the Office.

4.3 The Indirect Economic Effects

Apart from the direct economic benefits attributed to the operations of a competition watchdog, there are also indirect benefits arising from deterrence effects, i.e., the existence of a competition authority deters companies from engaging in anti-competitive behaviour that they would have otherwise engaged in. This leads to an increase in the number of competing firms, lower mark-ups and boosts total factor productivity and economic growth.

³It is common in the literature for the benefits of merger/concentration decisions to be assumed to persist longer than one year, for reference see Garcia-Verdugo et. al. (2017).

⁴For 2017, the average growth rate was calculated based on the average between 2017 and 2018, whilst for 2018 the growth rate applied was solely that observed within the same year.

To the authors' knowledge, similar assessment studies of competition authorities have solely focused on estimating the direct economic benefits that accrue from the existence of a competition watchdog. The omission of indirect effects from such assessments has two important implications: (a) assessments which fail to account for deterrence effects would underestimate the return ratio of competition policy, (b) failing to account for such effects would mislead the competition authority when prioritising cases to investigate. In this sense, this study is novel as it attempts to quantify such indirect effects by applying various empirical methodologies and plausible assumptions. These indirect effects are intended to capture the deterrence effects of anti-competitive mergers and anti-competitive conduct, improvements in productivity and all the other duties of the Office apart from the control of concentrations.

The methodology employed by this study to capture the indirect effects of the Office is centred around the ad-hoc derivation of the share of aggregate Household Consumption attributable to the intangible effects of the Office over the 2014-2018 period. These intangible effects are proxied by the share of consumer sentiment (Eurobarometer, 2019) attributed to healthy competition. Subsequently, these annual aggregate levels are allocated across various NACE sectors in the economy and integrated into an input-output model in order to obtain the annual impact on GVA attributable to these indirect effects.

Resorting to Hendry's general-to-specific modelling, the Engle-Granger two-stage methodology was employed on quarterly Maltese national accounts data to quantify the effects of consumer sentiment on private consumption in Malta. An optimal regression analysis was carried out, followed by unit root testing. All variables were found to be I(1). After eliminating statistically insignificant variables at the 95% confidence level, the following parsimonious specification was used:

$$\begin{aligned} \Delta \log SC = & 0.3582 + 0.0236 \cdot SD + 0.1276 \cdot \Delta CSI_{-1} \\ & + 0.5263 \cdot \Delta \log SC_{-4} - 0.4015 \cdot [\log SC_{-1} \\ & - 0.2922 \cdot \frac{\log IFE_{-1} \cdot (1 - EFTR_{-1})}{SCP_{-1}} \\ & - 0.5947 \cdot \log SC_{-5}] \end{aligned} \quad (7)$$

$$\text{Adjusted } R\text{-squared} = 0.8398$$

$$\text{Durbin-Watson stat} = 1.72$$

$$\text{Prob}(F\text{-stat}) = 0.00$$

where SC is real private consumption expenditure, SD is a seasonal dummy variable, CSI is consumer sentiment

indicator, SC_{-4} is lagged real private consumption expenditure as a measure of habit persistence, IFE is the compensation of employees, $EFTR$ is the effective tax rate, SCP is private consumption expenditure deflator, $UNEMP$ is the unemployment rate, INT is the main refinancing operations rate, and FL is households' financial liabilities.

As can be seen from equation (7), the one-quarter lagged value of the consumer sentiment indicator is found to be a statistically significant predictor of real private consumption expenditure in Malta. Holding all the other variables constant, for a one-unit increase in the consumer sentiment indicator, real private consumption expenditure growth in Malta increases by 12.76%.

Consumer confidence cannot be solely attributed to non-economic factors. Ludvigson (2004) argues that roughly 80% of the total consumer confidence indicator is composed of future expectations and economic conditions, while the remaining share captures the indirect effects of non-observable factors. For the period under review, Eurobarometer surveys show that, on average, 66% of the respondents totally agree that competition encourages innovation and economic growth, while 32% totally agree that effective competition has an impact on consumption. If we proxy the effect of competition deterrence effects by deflating the share of consumer sentiment captured by indirect effects of non-observable factors (20%) by the share of respondents agreeing that competition encourages economic growth (71%) whilst further multiplying by the average share of private consumption expenditure to GDP over the period of study (27%), one will arrive at a share of 3.8%.

The indirect effect of the Office for Competition on consumption can be estimated by reducing the estimated consumer sentiment coefficient found in equation (7) by 3.8 percentage points, which is attributed to the perceived effect of effective competition on economic and consumption growth. Therefore, the consumption growth in the counterfactual scenario with no presence of the Office can be found by re-running equation (7) with the deflated coefficient. In addition, sensitivity tests were carried out to gauge the impact of the above assumptions on the results.

Multiplying the level of sector-specific household consumption (resulting from the indirect effects of Office) by the sectors' own average value-added multiplier, repeating this calculation across all the n sectors in the economy, and summing, would yield the annual estimate of the benefits to the economy in form of GVA due to the indirect effects specific to the Office.

4.4 The Total Economic Effects

The total economic effects were derived by summing each year's direct and indirect effects. To contextualise the estimates, the authors divided the total economic impact by the budget allocated to the Office to cover the costs of its operations between 2014 and 2018 to derive the return ratio, i.e., the return in terms of GVA to the Maltese economy for every Euro of budget allocated to the Office. These estimates allow for comparison with other Competition Authorities across the world as such estimates are very often estimated by the respective Authorities.

5 Results

The methodology employed by this study allows for the assessment of the impact resulting from the direct and indirect effects of the Office, in terms of GVA, at a sectoral level. The resulting estimates discussed in the section are based on the average value-added multipliers described in equation (4) which implicitly invoke the various assumptions surrounding the application of the Leontief Demand Driven model. From the sectoral analysis undertaken, various key findings can be highlighted. Firstly, it should be noted that the year-to-year impact that the Office has on the various sectors is highly influenced by the sectors affected by the concentration decisions, namely its direct effects. However, given the widespread nature and magnitude of the indirect effects and the resulting multiplier effects, on average, all sectors in the economy have been positively impacted in terms of value-added generated by the operations of the Office. The sectors affected most by the Office in terms of value-added generated between 2014 and 2018 have been the: (a) Information and Communication sector, (b) Wholesale and retail trade, repair of motor vehicles and motorcycles sector, (c) Transportation and Storage sector, (d) Accommodation and Food service activities sector, and (e) Real Estate Activities sector. In terms of indirect effects, three sectors stand out: (i) the accommodation and food service activities sector, (ii) the real estate activities sector, and the (iii) wholesale and retail trade, repair of motor vehicles and motorcycles sector. Figure 2 presents the total effect of the Office in terms of its benefit to the economy aggregated across all sectors, for each year considered in this assessment. Figure 2 also disaggregates the annualised figures between the direct and indirect effects of the Office. For ease of interpretation, results are also presented in Table 1.

Over the study period, 2017 followed by 2015, are the two years in which the benefit to the economy in terms of GVA attributable to the operations of the Office amounted to the highest values, at €13.7 million and €11.8 million, respectively. For each of the years assessed, the direct effects impact of the Office was always higher than

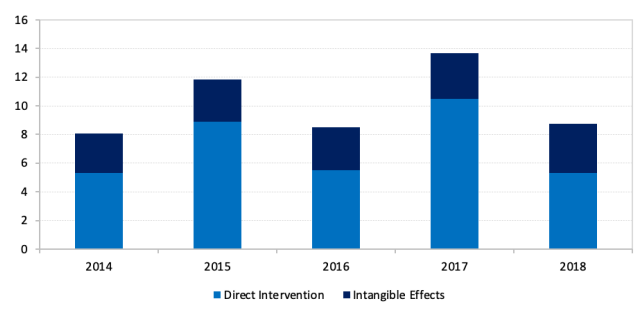


Figure 2: Direct, Indirect and Total Effects of Office in terms of GVA (Euro) between 2014 and 2018, EUR millions. *Source: Authors' Calculations.*

that from indirect effects. Indeed, the average contribution to GVA attributable to the direct effects, between 2014-2018 was €7.1 million per year, whilst that of the indirect effects amounted to €3.1 million per annum over the same period. This implies an average total benefit to the economy in terms of GVA attributable to the Office over the 2014-2018 period of €10.2 million per year.

The return ratio (Table 1) helps the policymaker and economic agents evaluate the benefit of further investing in the Office. The annual return ratio over the 2014-2018 period illustrates the benefit to the economy per euro of budget allocated to the Office, an average of 30.4. Over the time period considered, the minimum return ratio amounted to 24.5 in 2016, whilst the maximum was 41.2 in 2017.

6 Conclusion

It is becoming increasingly important for competition authorities to assess and explain the impact of their interventions on society. Several competition authorities carry out studies in this area to be able to put the budget allocated to them in perspective. While this study follows the same principles, the study adopts the input-output framework as a basis for quantifying the direct and indirect GVA effects emanating from the Office's activities between 2014 and 2018.

The average economic effects in terms of GVA in the period under review are estimated at an annual average of €10.2 million, of which €7.1 million is attributed to the direct intervention of the Office. The rest are attributed to indirect effects, interpreted by the authors as capturing deterrence effects of anti-competitive concentrations and anti-competitive conduct, improvements in productivity due to increased competitiveness and returns from other responsibilities carried out by the Office save for control of concentrations. These amounts equate to an average return ratio of 30:1 for every Euro allocated to the Office in terms of GVA. This ratio is high compared

	2014	2015	2016	2017	2018
Direct Effects	5,320,518	8,875,636	5,487,289	10,479,792	5,300,981
Indirect Effects	2,755,524	2,943,042	3,031,699	3,176,399	3,440,448
Total Effects	8,076,042	11,818,678	8,518,988	13,656,191	8,741,428
Budget Allocation of Office	314,859	340,469	346,862	331,633	336,379
Return Ratio	25.6	34.7	24.6	41.2	26.0

Table 1: Direct, Indirect and Total Effect of Office in terms of GVA (Euro) and Return Ratio between 2014 and 2018. *Source: Authors' Calculations*

to similar studies (e.g., for 2015 to 2018, the ratio of direct benefits to costs estimated by the UK Competition Authority was 17:1).

There are some important caveats to the study. Firstly, the robustness of the results depends to a high degree on the quality of the data compiled by the NSO. The results are dependent on the input-output table for 2015 published for the Maltese economy and, therefore subject to change as new input-output tables become available. Secondly, the Leontief demand-driven model is based on a number of key assumptions, particularly fixed-coefficient production functions (or fixed technical coefficients), hence input substitution is not allowed, no input constraints (supply of inputs assumed to be infinite), production in every industry is subject to constant returns to scale, output is a linear function of final demand, and each industry is assumed to produce one homogenous product. Thirdly, the indirect effects of competition policy are based on the Eurobarometer survey which methodology although informative and easy to apply, may realistically prove too simplistic to accurately disentangle the tangible effects of competition policy from intangibles (e.g., risk aversion and thrift habits). Furthermore, the assumption that changes in consumer sentiment are solely attributed to the activities of the Office may overstate the indirect economic multipliers inferred and erroneously attribute effects on consumers' sentiment which are driven by alien activities (e.g., trade and consumer policies in the EU, economic growth in the Maltese economy, governance) to the Office. Finally, because competition output is not directly observable, better indicators of consumers' perceptions on the intangible effects of the Office is needed. While competitive prices, lower mark-ups and higher consumer sentiment are uncontested channels through which competition policy affects the economy in general, further research is needed into how competition policy affects different income groups in society. It is often argued that the costs of anti-competitive practices are relatively higher for poorer households than for richer ones.

Notwithstanding these limitations, quantifying the benefits-to-cost ratio of competition authorities is a useful exercise that is very informative about the relevance of competition authorities, the results of their intervention and their evolution over time. This study has a number of policy implications: firstly, it helps the Office to put into perspective the budget allocated to it by the Government of Malta in perspective by gauging the rate of return. Secondly, these results could also motivate case priorities based on expected economic impacts.

Disclaimer

This article presents findings based on a study conducted for the Office for Competition within the Malta Competition and Consumer Affairs Authority. This study's ownership rights, and intellectual property remain exclusively vested in the Malta Competition and Consumer Affairs Authority. The authors were granted permission to publish this academic article. The views expressed in this article have been written under the authors' sole responsibility and should not be construed as representing the views of the Office for Competition, the Malta Competition and Consumer Affairs Authority, the University of Malta, and/or the Government of Malta. Any errors or omissions are the sole responsibility of the authors. The authors would like to thank the staff working at the Office for Competition for their assistance and collaboration.

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