

A Work Project, presented as part of the requirements for the Award of a Master's degree in Economics / Finance / Management from the Nova School of Business and Economics.

EQUITY RESEARCH ANALYSIS ON PHILIP MORRIS INTERNATIONAL

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**Abstract**

This Work Project consists on an Equity Research Analysis to Philip Morris International. The valuation is based on the analysis of the company's financials and strategy as well as the definition of the drivers of its growth. The usual financial valuation techniques of discounted cash-flows and multiples' analysis derive in a recommendation for investors to sell, hold or buy this equity.

**Keywords:** Philip Morris International, Tobacco, Reduced-Risk Products, IQOS

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**PHILIP MORRIS INTERNATIONAL**

**COMPANY REPORT**

CONSUMER GOODS: TOBACCO INDUSTRY

3 JANUARY 2019

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**Delivering a Smoke-Free Future**

*An opportunity for value in the tobacco market*

- We recommend a **BUY** position on Philip Morris International, given our FY20 price target of **112.71\$** against the current price of **85.09\$**, corresponding to an overall upside of **37.9%**.
- This report considers that the market underestimates Philip Morris' value as it overweighs the decrease in cigarettes shipment volumes, without compensating with the increase in sales of reduced-risk products, which are subject to lower taxation regimes and therefore will have a major impact on net revenues.
- Philip Morris International strategy for future years is to lead the way in shifting the tobacco industry from combustible tobacco products to potentially less harmful heat-not-burn products.
- Asia, forecasted to be the world's growth motor this century will also be the fuel for PMI revenues growth with a CAGR of almost 4% forecasted for the next decade.
- In 2019 the stock has gained around 30%, above the 20% earned by the S&P500. However, volatility has proved one more year to be present in the moves of its price achieving an annualized value of 22%, well above that of the index.

**Company description**

Philip Morris International is one of the worldwide giants in the tobacco market with presence in 180 countries. The company is focused in leading the way to a smoke-free future by shifting tobacco consumption from combustibles to reduced-risk products.

**Recommendation: BUY**

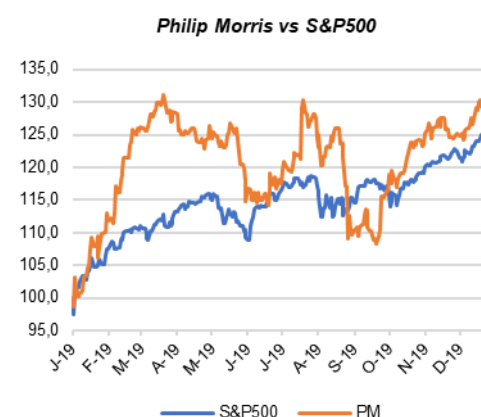
**Price Target FY20: 112.71 \$**

**Price (as of 31-Dec-2019) 85.09 \$**

Reuters: PM.N, Bloomberg: PM:US

52-week range (\$)	65.69 – 92.74
Market Cap (\$m)	133,960
Outstanding Shares (m)	1,566

Source: Bloomberg Terminals



Cumulative returns on PM and S&P500 on a 100 basis, 2019

(Values in USD millions)	2018	2019E	2020F
Revenues	79,823	80,948	82,808
EBITDA	12,325	12,830	13,093
NOPLAT	8,760	8,346	8,517

Source: Company Report

**THIS REPORT WAS PREPARED EXCLUSIVELY FOR ACADEMIC PURPOSES BY FILIPE AIRES AND LORENZO REPETTI, A MASTER IN FINANCE STUDENT OF THE NOVA SCHOOL OF BUSINESS AND ECONOMICS. THE REPORT WAS SUPERVISED BY A NOVA SBE FACULTY MEMBER, ACTING IN A MERE ACADEMIC CAPACITY, WHO REVIEWED THE VALUATION METHODOLOGY AND THE FINANCIAL MODEL. (PLEASE REFER TO THE DISCLOSURES AND DISCLAIMERS AT END OF THE DOCUMENT)**

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## Executive summary

Philip Morris International is one of the world leading tobacco companies, operating in 180 markets and producing the number one cigarette brand in the globe per market share: Marlboro. Combustibles are not the only core business product since the end of 2014, when the company introduced Reduced-Risk Products (RRPs), led by IQOS, to the markets.

### The Company's strategy

Even though the company's combustibles shipment volumes keep decreasing, due to the heavy regulatory framework surrounding tobacco and its health implications, net revenues keep increasing. This happens not only because of the addictive nature of cigarettes that lead to consumers' being the agents bearing the excise taxes' burden and price increases but also because of growing IQOS's sales and lower taxation on it. Therefore, PMI's strategy is to "deliver a smoke-free future", by increasing RRP's consumption.

- Evaluation

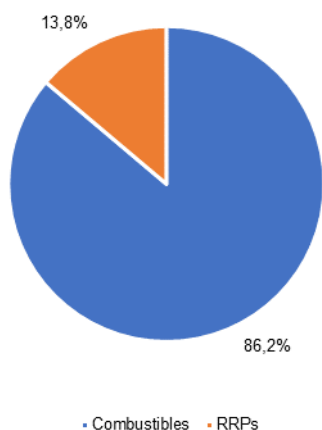
In order to assess the profitability of an investment in PMI, two main techniques were implemented. First, a multiples valuation, which combined with a comparables' analysis, shows a severe underestimation of the company's value by the market, resulting into a buy recommendation. Secondly, a discounted cash flows analysis based on the following value drivers: GDP, unemployment, shipments of combustibles and shipments of RRP's. The result was very similar, with the same buy recommendation.

Based on the discounted cash flows technique, the average return of an investor buying PMI will be equal to 37.9% in the next year and an opportunity to create value from a solid and well-installed company that is leading the innovation in its industry.

## Company overview

Exhibit 1 – Revenues' split between combustibles and RRP's

Core Business Revenue split



Source: Company Report

### Company description

Philip Morris International Inc. (hereinafter referred to as “PMI”) is a leading international tobacco company: it counts more than 180 markets and is a leading company per market share worldwide. The company counts six cigarette brands in the top 15 per market share, including the world’s most notorious, Marlboro, which holds the number one spot.

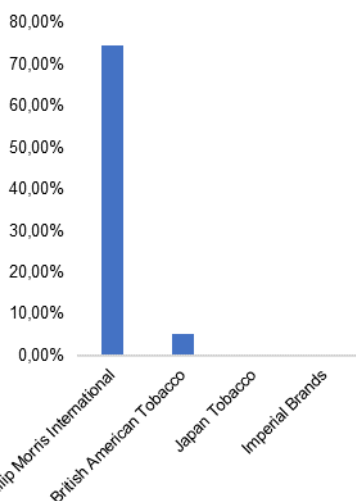
With 46 production facilities spread around the globe, PMI employs more than 77,000 people, satisfying the demand of over 150 million customers.

What distinguishes PMI from the majority of its competitors, is the turning point for its business model since 2008: since then, the company invested more than 6 billion dollars into the development and research of smoke free products, hiring more than 400 scientists and engineers to do so. Since 2015, the reduced-risk products (RRPs) are commercialized and represent a growing portion of PMI’s revenues.

Therefore, the company’s core business of the last four years is divided in two categories: combustible products and RRP’s. From 2015 until today, the share of the latter grew to 13.8% of the net revenues, as shown in Exhibit 1.

Exhibit 2 - % of float held by institutions

% of Float held by institutions



Source: Yahoo Finance

### Shareholder structure

Mutual fund holders together with other institutional investors hold around 75% of the floating of PMI (The Vanguard Group and BlackRock Fund stand with the highest percentages, with around 8.0% and 6.24%, respectively) while individual shareholders account for less than 0.5% of it.

When comparing PMI’s shareholder structure with that of other companies in the industry one realizes how high is the interest of external investors in the company (relatively to PMI’s peers). Up to some extent, this can be interpreted in the sense that the market recognizes the opportunities and potential of PMI.

- Dividends Policy

Dividends Policy is a main topic of interest for shareholders and Philip Morris International is committed to maintain its growth as a priority. However, apart from assuring dividend growth the company also focuses on its stability. Then, a continuous growth in dividends is expected even though it will tend to stabilize slightly above 1% as we tend to the perpetuity terminal growth.

	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Dividend per share \$	4,59	4,70	4,90	4,90	4,99	5,00	5,09	5,16	5,22	5,30
Dividend Growth		2,4%	4,2%	0,0%	1,8%	0,1%	1,7%	1,4%	1,1%	1,5%

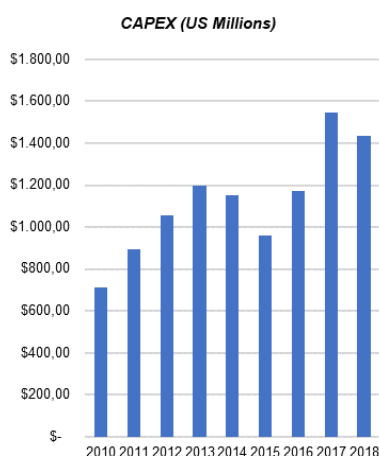
Exhibit 3 – Dividend's forecasts

## Brands

PMI holds a wide portfolio of brands commercialized worldwide, divided in the two categories mentioned before. Belonging to the first and more traditional one, combustibles, for which the leading brand is Marlboro, the most sold in the world, representing alone 9.7% of the volume in the international industry and 34% of PMI's cigarette shipment volume. L&M and Chesterfield follow with a 5.5% market share altogether. Overall, the combustible products commercialized by the company represented 28.1%, 27.9% and 28.4% of the whole industry in 2016, 2017 and 2018, respectively, showing a solid and notorious presence of the company in the market.

Reduced-risk products are potentially less harmful products than the traditional combustible ones. The factor characterizing all these products is the lack of combustion, replaced by generation of an aerosol (vapor), still containing nicotine. Moreover, RRP's can be divided in two sub-categories: electronic cigarettes and heated tobacco products. The first group consists into electronic devices which warm up specific liquids turning them into vapor. The second category is also characterized by electronic devices, but instead of heating liquids, they heat proper tobacco. PMI claims to have a wide range of different RRP's in various stages of development and commercialization: concretely, IQOS (I Quit Ordinary Smoking), belonging to the heated tobacco products, is the only one sold worldwide and at the moment it amounts to the total of the revenues from RRP's. The rest of them do not contribute to revenues yet, they are under development and can be identified in increases in capital expenditure in the reformulated cash flows map. Therefore, the RRP's portfolio is led by IQOS and its tobacco units Heets. As of 2018, IQOS is available for sale in 44 markets and Heets market share equals 1.6% of the total tobacco industry, which is remarkable considering that currently there are more than 321 cigarette brands in the world and this new product was introduced to the markets four years ago.

Exhibit 4 – CAPEX of PMI (in millions of US dollars)



Source: Analyst Estimates – Equity Research report

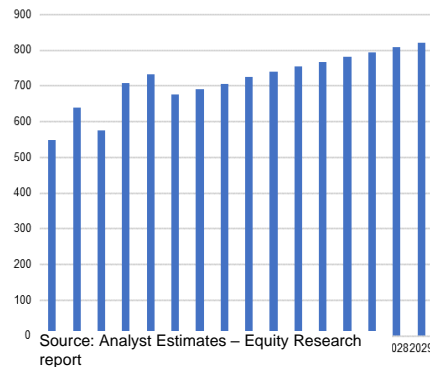
## Strategy

The company is going through what it defines “the biggest shift in the history of Philip Morris International”. The strategy for the coming years is the transformation announced in 2017, which had already started years before, with the initial investments in R&D and with the vision to “deliver a smoke-free future”. In 2018 those R&D investments reached \$6 bn since 2008, and our analysis forecasts them to grow by 2% every year in the coming decade. This also reflects PMI’s goal, which is to reach 2025 by achieving 38% net revenues coming from RRP’s and eventually to totally replace cigarettes with smoke-free products. The company’s choice to start the shift in its production focusing on heated tobacco products rather than electronic cigarettes has a reasonable explanation: both choices require an initial investment (capex) and R&D costs to develop the electronic devices creating vapor. Nevertheless, by producing heated tobacco products PMI can still employ its tobacco production network, without having to explore a new field, as these products still require tobacco sticks similar to cigarettes for production costs and materials. Consequently, after the initial investment, the company continues to take advantage from its economies of scale. Besides, the targeted customers are unchanged. In fact, it consists on smokers willing to shift to a less harmful product, still very similar to a cigarette. On the other side, our valuation considers the negative consequence that this choice has on combustibles’ sales: in particular, targeting the same customer for both combustibles and RRP’s results into cannibalization – in the next sections it will be explained how PMI is working on having a sustainable shift from one to another product line.

While the tobacco units produced by the company, Heets, do not represent a substantial change in production for their similarity with cigarettes, the electronic machine required to vaporize them, IQOS, is a whole different thing. PMI had to invest in the development of its electronic devices and to develop a different strategy than the one for cigarettes. In fact, talking only about IQOS and excluding Heets for a moment, there is no regulatory framework establishing the place to sell the device, its price, or taxes other than the VAT. The company designed IQOS so that it would look minimal and modern, leaving to the customer the choice on customizations. Every year so far it has released a new model - we are now at IQOS 3.0 and special editions; in substance the product is very similar when looking at its technologic parts, but it is slightly redesigned, and its battery gets improved. This kind of approach on the market is comparable to the one of the smartphone industry. Moreover, PMI created “IQOS embassies”, stores fully dedicated to the sale of this RRP where the customer can buy it and

Exhibit 5 – Marketing and selling expenses

Marketing and selling



receive assistance. Besides that, IQOS can be bought in tobacco shops and duty-free shops at airports. In Europe, its initial price starts just below 100€ and within one year it stabilizes around 60€. This means that PMI invests into marketing in order not only to attract new customers, but also to lead the existing ones to buy the new model of its product. This explains the growth of the marketing and selling expenditure we forecasted: in 2014 it was equal to \$549m, while we predict it to be closer to \$820m in 2029.

PMI’s objective to “deliver a smoke-free future”, which translates into producing only heated tobacco products, may seem unlikely to reach, considering that in 2018 the total revenues coming from RRP’s were barely above 5%. Nevertheless, two factors play a major role here: emerging markets and excise taxes. The strong presence of PMI in the emerging markets, especially in Asia, is one of the aspects that differentiate it from its competitors. Precisely in Asia, revenues in 2018 from non-combustible products represent 11% of the total alone. Secondly, excise taxes are over 99% concentrated on cigarettes; this implies the fact that, considering net revenues instead of total revenues, RRP’s already represented 13.8% of net revenues in 2018, after three years of its launch. In these terms, the goal of 38% does not seem unachievable anymore.

On another note, the World Health Organization estimates that in 2025 the number of smokers will remain on the same level as today, around 1.1 billion people. PMI is planning to beat the competition by attracting customers of other cigarette brands to its smoke-free products. This will not be entirely possible without converting some of its own customers from combustibles to RRP’s, but if the company manages to keep its leadership in the heated tobacco product, customer acquisition can overcome cannibalization.

## Segment analysis

In this section, PMI’s regional performance will be analysed, for both combustibles and reduced-risk products. Past data of revenues and shipment volumes will be presented in order to better understand the forecasts until 2029.

In 2018, PMI created two new reporting geographic segments by separating Eastern Europe from Middle East & Africa and by dividing Asia in two macro groups. We believe that, for evaluation purposes, this new division does not add extra value to the analysis, as it separates geographic areas in which the industry follows the same trends. Therefore, the regions have been re-aggregated in the following study.

## The European Union Region

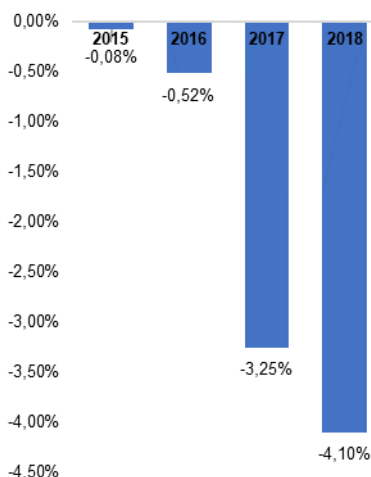
The European Union Region has a wide range of policies for tobacco control, since it is the region with the highest relative number of smokers (41% of men and 22% of women according to the WHO Europe survey *Who is smoking?*, 2016). These policies cover different factors and have the goal to decrease the percentage of tobacco users. During the past decade, their severity has been intensified with higher taxes, which resulted in price increases, advertisement bans, health-related warnings on packages and higher age requirements. In 2014, the EU adopted a new version of the Tobacco Products Directive, which has been transposed to law by all members of the Union. This Directive increases the size of the health-related warnings on packages, even allowing the Member States to introduce plain packages, bans flavoured tobacco products and provides a framework for the regulation of all tobacco related products, therefore affecting RRP's too. Member States had to implement the Directive by May 2016.

In this context, a decrease in the total shipment volume of PMI's combustibles between 2016 and 2017 was predictable: it went down by around 3.2%, and the following year by 4.1%. In 2018, the decrease in cigarettes sales was partly offset by the increase in the shipment of Heets (tobacco sticks for IQOS), which were more than triplicated. Overall, the total shipment volume went down by 1.9%.

Nonetheless, this volume reduction did not translate into a revenue reduction. In fact, revenues still increased by 4.7%. This is due to a favourable pricing variance and volume mix. Moreover, the excise taxes increase of last year mostly affected combustible products: the increase in revenues for the RRP's completely eliminated its effect. In 2018, net revenues amounted to a total of \$9,298 million, to which Heets contributed with \$865 million.

Looking at the coming years, the developed model forecasts a stable and gradual decrease in cigarettes shipment, in line with the trend of the past years and the efforts of the governments' policies to reduce the number of smokers. On the other side, we predict an equally solid growth in the shipment of heated tobacco products. Even though the forecast does not predict a number of Heets equal to cigarettes by 2029, as can be seen in Exhibit 7, one must keep in mind that revenues on Heets are higher than the ones on cigarettes, as they have a similar manufacturing cost but lower taxes associated. Consequently, the European Union can be expected to be a profitable segment for PMI's future operations.

Exhibit 6 – Decrease (%) of the Shipment of Combustibles in the EU



■ Shipment Combustibles % decrease  
Source: Company Report

European Union	2019E	2020E	2021E	2022E	2023E	2024E	2025E	2026E	2027E	2028E	2029E
<b>Shipment Volume</b>	184025	181225	178425	175625	172825	170025	167225	164425	161625	158824	156024
<b>Shipment Combustibles</b>	177238	172526	167815	163103	158391	153680	148968	144256	139544	134833	130121
<b>Shipment Heets</b>	6787	8699	10610	12522	14434	16345	18257	20169	22080	23992	25903

Exhibit 7 – EU Shipment volumes forecasts

## Eastern Europe, Middle East and Africa

Middle East and Africa are the only regions left in the world in which analysts estimate a substantial growth in the number of smokers for the coming years. Reasons to this can be found in the weak policies regulating the market, low cigarette prices and often absence of health-related warnings on the packages. Most of the governments did not steadily raise taxes year by year and countries like South Africa have tax rates at 40% of the retail price of most cigarette brands, which is 30 p.p. inferior to the recommended level by the World Health Organization<sup>1</sup>.

In these regions, PMI experienced a very low variance in the shipment volumes for 2018, because of the decline of demand in Saudi Arabia and the United Arab Emirates, almost completely offset by the increased demand in Turkey.

In principle, Eastern Europe would have a similar political and economic framework surrounding the tobacco industry. Prices and taxes are low, there is a high number of smokers and policy makers often neglect the recommendations of the WHO. Despite that, in 2018 PMI suffered a loss in the shipment of cigarettes in the region, especially in Ukraine and Russia, only partially offset by the increase in heated tobacco products shipment.

The decrease in cigarettes shipment volumes compared to the ones of 2017 did not damage PMI's net revenues in EEMEA, which increased by 5% in 2018. The reason is mainly identifiable in the favourable pricing variance in Russia and Ukraine, which compensated the decreased demand for those countries, and in the increased sales of RRP's. In 2018 the shipment of Heets in this region went beyond the ones in Europe by 2.4 billion units, reaching a total of 8.38 billion units in 2018, four times the shipment of the previous year.

The forecasting model is in accordance with the analysis above. Shipment of cigarettes are expected to decrease slightly: this is not the result of a fall in the market size, which is supposed to get even larger, as stated in the above paragraph. It is instead the result of cannibalization, as the rapid increase of Heets shipment is likely to reduce the amount of cigarette smokers in general, including smokers of PMI's brands.

Eastern Europe, Middle East and Africa		2019E	2020E	2021E	2022E	2023E	2024E	2025E	2026E	2027E	2028E	2029E
Shipment Volume		262264	259368	256472	253577	250681	247786	244890	241994	239099	236203	233307
	Shipment Combustibles	253092	247535	241977	236419	230862	225304	219746	214188	208631	203073	197515
	Shipment Heets	9171	11833	14495	17157	19820	22482	25144	27806	30468	33130	35792

Exhibit 8 – EEMEA Shipment volumes forecasts

<sup>1</sup> Bloomberg, The editors, *Stop Rising Tobacco Use in Africa and the Middle East: Editorial*, June 26<sup>th</sup> 2018

## Asia and Australia

Asia is the continent with the highest number of smokers and its south eastern region alone contains 10% of the smokers of the whole globe<sup>2</sup>. The reason is again to be found in the political, legal, and socio-economic environment. Differently from the previously analysed region, here the World Health Organization's measures against tobacco are more commonly translated into law. The problem is that often they still do not get implemented for a variety of reasons, first of which lack of funds and political commitment. Moreover, tobacco products taxation is not as efficient as it could be, and it results in sporadic and minimal cigarette price increases. A key factor that gives the industry more influence in the region is the lack of structured policies against tobacco advertisement: this gave PMI the chance to promote its IQOS and Heets, which gained a high popularity shortly after their introduction in the market.

On the other side, Australia's tobacco industry is more like the European one from a regulatory perspective. The country became a party in the World Health Organization Framework Convention on Tobacco Control in 2015. The regulations started improving already in the 1990s, after a tobacco industry scandal which started with the leaks of previously confidential documents of British American Tobacco, in which the company, among other topics, also explained its strategy to induce teenagers to smoke<sup>3</sup>. Events of this kind and claims against tobacco companies are factors increasing the volatility of their share value.

In this region, the shipment volume went down by 2% since 2017; the favourable conditions in South and Southeast Asia, where the volumes increased by 4%, were not high enough to compensate the severe volume decrease in East Asia and Australia, where shipment went down by 13%. PMI suffered major losses in Australia and Japan, because of higher excise taxes introduced by the governments.

The revenues suffered a small loss too, equal to 1.5% in total. When looking at the revenues coming from Heets only though, they decreased from 3,310\$ million to 2,600\$ million, losing 21.5%. This represents the biggest loss of the year and André Calantzopoulos, PMI's Chief Executive Office attributed it to a lower than anticipated IQOS customer acquisition. One can blame the overconfidence of PMI in the estimate of the future IQOS customer acquisition in the region, led by

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<sup>2</sup> Southeast Asian Tobacco Control Alliance, *Tobacco Companies Making a Fortune in Southeast Asia, March 13<sup>th</sup> 2018*

<sup>3</sup> <https://www.tobaccoinaustralia.org.au/chapter-10-tobacco-industry/10-10-the-tobacco-industry-exposed-tobacco-industr>

the great success of the product in the first three years of commercialization. Nonetheless, Asia remains the continent in which PMI has the biggest number of customers of heated tobacco products.

The forecasts for the next years remain positive concerning Heets shipment, also because of a rapid rise in the customer base of the region. Concerning cigarettes, again we forecast a decrease in the shipment of combustibles which is not entirely dependent on a drop in demand; it is as well a consequence of cannibalization.

Asia and Australia	2019E	2020E	2021E	2022E	2023E	2024E	2025E	2026E	2027E	2028E	2029E
<b>Shipment Volume</b>	256159	250157	244154	238152	232149	226147	220144	214142	208140	202137	196135
<b>Shipment Combustibles</b>	213135	196626	180117	163608	147099	130590	114081	97572	81064	64555	48046
<b>Shipment Heets</b>	43024	53531	64037	74544	85050	95557	106063	116570	127076	137582	148089

Exhibit 9 – Asia and Australia shipment volumes forecasts

### Latin America and Canada

Latin America is the region striding the most against the tobacco industry in the last two years, according to the WHO, making the greatest progress in decreasing the rate of smokers. Especially Argentina and Chile have implemented taxes in complete agreement with the levels recommended by the WHO, while Brazil and Peru are putting their efforts into creating a framework for controls of heated tobacco products. In many South American countries, the sale of alternatives to cigarettes is illegal, while consumption is allowed.

Canada is also a party to the WHO Framework Convention on Tobacco Control since 2005. Consequently, tobacco advertising and promotion are generally prohibited, and health warning images occupy 75% of the packages. Moreover, in this country the competition of PMI is particularly strong, with Imperial Tobacco Canada detaining 49% of the market alone.

This is the least profitable region for PMI, with low shipments and revenues. Shipment volume since 2017 went down by 4%, mostly due to the lower Argentinian and Colombian markets. Nonetheless, the total revenues slightly increased by 2.2% thanks to the favourable pricing variance across the region.

The number of smokers in Latin America and Canada is expected to decrease in the coming years, following the trend of the past decade, and so is PMI's shipment volume of combustibles. The difference with the previously analysed regions is that here this decrease will not be supported by a strong increase in the shipment of Heets. Reason to this is the severe regulatory framework surging around every alternative product to cigarettes. Even electronic cigarettes and liquid vaporizers never found success here: it seems unlikely to expect a different scenario evolution for IQOS. In these conditions, the Latin America and Canada

region represents the least profitable region for PMI, contributing minimally to the overall growth forecasted for the coming years.

Latin America and Canada	2019E	2020E	2021E	2022E	2023E	2024E	2025E	2026E	2027E	2028E	2029E
Shipment Volume	87025	86721	86417	86112	85808	85503	85199	84894	84590	84286	83981
Shipment Combustibles	86894	86558	86222	85885	85549	85212	84876	84539	84203	83866	83530
Shipment Heets	131	163	195	227	259	291	323	355	387	419	451

Exhibit 10 – Latin America and Canada shipment volume forecasts

## The Sector

In this section, the tobacco industry will be analysed as a whole. After an overview of the macroeconomic environment for the industry, a study on the competition of the company will follow.

### Macroeconomic environment of the tobacco industry

The tobacco industry represents a peculiar category of the retail and customer goods sector. Tobacco has been produced and consumed by men for thousands of years, since 5000-3000BC. In more recent times some of the producers started shifting their production to different types of products, other than cigarettes. Therefore, before diving into PMI’s financials, one must keep in mind the factors that affect the tobacco market from a broader perspective.

- Political and regulatory factors

Local policies have a great impact on tobacco sales and can be divided into two major groups: taxes and restrictions to smoking.

Starting by excise taxes, these represent the typical nature of imposition on tobacco products. By definition, excise taxes should be paid mostly by producers, not by customers. This does not happen in PMI’s case, because the demand of cigarettes, which are scientifically proven to be addictive, is inelastic. Consequently, the company increases cigarette prices and the actual part bearing the burden of the excise taxes is the customer.

Moreover, the highest percentage of excise taxes is applied to combustible products. Heated tobacco products produce vapour instead of smoke and are consequently subject to a smaller portion of excise taxes. Therefore, since the company is planning a shift in the production to a greater amount of RRP’s, excise taxes in real terms will be lower – keeping the assumption that these products will be regarded as less harmful and taxed accordingly.

On the other side, concerning the restrictions, they come as a consequence of the harmful nature of products of tobacco and can have different natures. An

example is age restrictions - laws defining a minimum age below which it is forbidden to consume products of tobacco. These have a negative impact on the revenues of tobacco companies especially when the limits become more restrictive: for instance, from 2015 until today PMI's combustibles shipment volume in the European Union has decreased by 4.6%. Apart from the introduction of RRP's, one of the reasons is that by European law, since the 1<sup>st</sup> of January of 2015 the minimum age to buy cigarettes increased from 16 to 18.

Another kind of restriction concerns marketing and brand advertising. In most developed countries, PMI and its competitors cannot advertise their brands. One should not be too quick to judge the effect that these restrictions have though. In fact, while on one side this limits the chances to acquire new customers, on the other side it makes it almost impossible for new businesses to enter the market. The sector is therefore characterized by high entry barriers and for some aspects can be considered close to an oligopoly.

- **Social factors**

From a social perspective, the tobacco industry has a very bad reputation due to a wide range of reasons. Most importantly, cigarettes are heavily harmful not only for the smoker, but also for people nearby. Furthermore, smoking pollutes the environment and the filter tips, in particular, are not biodegradable. All of these characteristics are defined as negative externalities: they represent a cost for the society, and this is one of the reasons governments tax cigarettes with excise taxes.

As explained above, this is not enough to stop the industry. It only slows it down, mainly because of the addictive nature of the product. This is the aspect that keeps PMI in a relatively safe spot, being also reflected in a relatively low beta. All these characteristics lead to our expectation of a growing focus on RRP's by PMI, which we forecast to lose shipment volume in cigarettes and to increase it in RRP's.

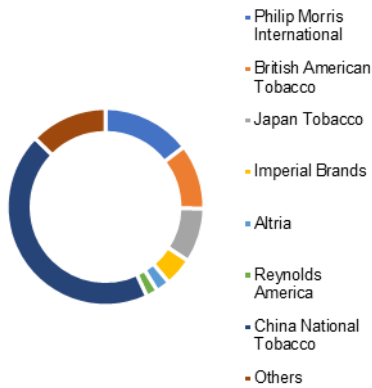
## Competitive Landscape

The tobacco industry is formed of a reduced number of very large firms that operate internationally in most countries and sell in all continents. For the purpose of this competition analysis we exclude China, responsible for roughly 40% of the world's tobacco consumption, as in that country the industry is state owned. It is also important to mention that PMI is not operating in the US, as it is its sister company Altria competing there.

Currently, Philip Morris International's core competitors, the firms in the same industry operating in a similar large scale, whose moves will impact PMI are

Exhibit 12 – World Market Share of Tobacco

World Market Share of Tobacco



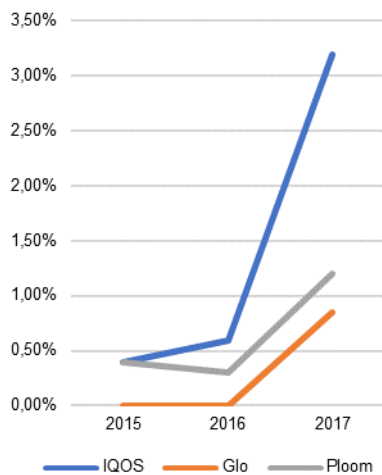
Source: Euromonitor International

Japan Tobacco, British American Tobacco, Imperial Brands and Reynolds America. These firms alone stand for more than 85% of the worldwide market share of tobacco – Exhibit 12. In terms of scale and financial soundness, PMI is in a privileged position compared to all the mentioned competitors.

Regarding traditional smoking, it is no novelty and it has been referred in this report that PMI takes the lead. For now, combustible products are still driving the tobacco industry but will not be the focus of the companies competing at this scale in the coming years. Their eyes will be on maximizing the sales of new generation products while balancing a gradual decrease of sales in combustibles. Doing a good balancing will be key and represents a true risk of losing both markets should a company fail on it. Up to the moment, PMI has kept its position in the industry of combustibles and is also standing in front of the market for RRP's.

Exhibit 13 – Market share of heated tobacco brands in Japan

Market share of heated tobacco brands in Japan



Source: BMJ Journal

Since the future of the industry on the eyes of all these companies passes by promoting a “smoke free future” where smoking will be done through new generation products, potentially less harmful, analysing the competition landscape implies understanding how firms are positioning on this market. Currently, PMI’s IQOS, British American Tobacco’s Glo, Japan Tobacco’s Ploom and Imperial Brands’ Pulze are the heated-tobacco products ahead. Heated tobacco is a trend that is being pushed by both the industry and the consumers, both looking to shift to safer alternatives to combustible tobacco products.

Japan is currently, and by far, the country with the highest percentage of heated-tobacco products smokers while the rest of countries still have less significant percentages of smokers in this products line. Therefore, it might be useful to understand the market in Japan as one can expect the pattern to be similar in other countries should PMI and its peers keep their strategies. In that country, IQOS is significantly ahead of its rivals, followed by Glo and Ploom – see Exhibit 13.

Since its creation, electronic cigarettes have been what can be considered a substitute to tobacco consumption, either of combustibles or heated tobacco. These products also contain nicotine but not tobacco and are becoming a trend, especially in the developed countries. In this context, PMI is currently lagging and there are companies who have aggressively invested in the last years that are surging and getting well established. Not competing harshly in this sector might represent a risk should RRP's finally be considered not so harmless on a later stage implying a potential move of consumers to vaping (non-tobacco products). However, as PMI has always been more focused on products containing tobacco, focusing on those might be beneficial and decrease the exposure to the

risk of being competing in another product which could lead to increased costs and loss of focus on the products that form the DNA of the firm.

## Valuation

In this section PMI will be quantitatively valued according to several widely used models in the financial industry.

Discounted Cash Flows valuation - followed by a correspondent sensitivity analysis - will be the first valuation technique applied. Then, the company will be subject to a Multiples Valuation, where multiples of its peers together with metrics of PMI will determine its value.

### DCF Valuation

One of the most widespread valuation methods is the Discounted Cash Flows method, which values a company by discounting future (forecasted) cash flows at the current weighted average cost of capital (WACC).

Please refer to the section 'Financials' sub-section 'Value Drivers Forecasting Methodology' for a comprehensive view on the definition of the factors affecting the forecasted future cash flows and the methodology followed.

To discount those forecasted cash flows, the average cost of capital has been used. The several components of WACC were computed or achieved as follows.

In order to get the Cost of Equity (Re):

1. The risk-free rate was assumed to be equal to the yield of US Treasury Bonds with 10 years maturity – 1.938%.
2. The Market Risk Premium was assumed to be 5.6% - as according to data from Statista this was the average MRP in the US in 2019 (the country where the company reports). This metric has been moving between the tight range of 5.3% and 5.7% since 2011; Also, this is certainly a value broadly accepted by the investment industry.
3. The beta of equity for Philip Morris was computed using the unlevered and debt betas:
  - a. The unlevered beta (0.67) is the result of the average of the median unlevered beta of the industry and the unlevered beta resulting from the stock's correlation with the S&P500 index.

- b. The beta of debt (0.23) was calculated using a 2019 bond with 10 years maturity and a YTM of 3.375%. Through the Moody's average corporate debt recovery rates, one finally gets the  $R_d$  and consequently the beta of debt using  $R_f$  and the MRP previously stated.

Finally, putting the Cost of Capital and the Cost of Debt weighted at the weight of Equity and Debt in the company's capital structure as well as the US federal tax rate of 21% to consider the Tax Shield, one gets a WACC of 5.50% (2020).

The last step consisted of summing the forecasted Enterprise Value for FY 2020 and the Unlevered Operational FCF and discount that sum by the WACC.

Summing up the Enterprise Value and the Non-Core Value of PMI and subtracting the Net Debt, the Equity value is achieved. Considering the 1,556 million shares outstanding, 112.71\$ is the targeted price for the share. This means a total return of 37.9% by accounting the forecasted dividend of 4.59\$, representing a great opportunity of investment for FY 2020.

## Sensitivity Analysis

The discounted cash flows method used to forecast the share price relies on several assumptions. Two key variables are the terminal growth rate, which is decisive in the computation of the terminal value, and the WACC which is used to discount the future cash flows forecasted. Testing the changes in the output as a consequence of changes in these two variables will give one a sense of what is at stake when these inputs suffer changes. To test it we will analyse the changes in the stock price when terminal growth and WACC move in a range of  $\pm 25\%$  and  $\pm 5\%$ , respectively.

One can see that the forecasted price goes from as low as 96.15\$ to as high as 135.31\$ in the most extreme cases of moves in the terminal growth rate and WACC in the ranges defined above. Those ranges are not so restrictive when terminal growth is predicted as of ten years in the future and depends on innumerable factors as new competition, monetary and fiscal policy or even structural changes in society affecting the industry and structural changes that might be done in the company. WACC is also subject to significant variations as for example to the interest rate target of Central Banks, which can move up or down depending on the economic conditions, leading to a move in investors demand for return for the same level of risk, *ceteris paribus*.

One should then be careful and consider that small variations in these two variables could lead to significant changes in the value predicted for PMI.

		Growth (g) - %							
	\$ 112,71	1,22%	1,35%	1,49%	1,62%	1,76%	1,89%	2,03%	
	5,22%	\$ 109,24	\$ 114,15	\$ 116,35	\$ 119,61	\$ 123,60	\$ 128,68	\$ 135,31	
	5,31%	\$ 104,76	\$ 112,51	\$ 114,09	\$ 117,24	\$ 121,05	\$ 125,88	\$ 132,18	
	5,40%	\$ 103,01	\$ 110,44	\$ 111,95	\$ 114,96	\$ 118,60	\$ 123,19	\$ 129,18	
WACC - %	5,49%	\$ 101,27	\$ 108,39	\$ 109,84	\$ 112,71	\$ 116,18	\$ 120,56	\$ 126,24	
	5,59%	\$ 99,55	\$ 106,37	\$ 107,75	\$ 110,50	\$ 113,80	\$ 117,97	\$ 123,36	
	5,68%	\$ 97,84	\$ 104,37	\$ 105,69	\$ 108,31	\$ 111,46	\$ 115,42	\$ 120,54	
	5,77%	\$ 96,15	\$ 102,40	\$ 103,66	\$ 106,16	\$ 109,16	\$ 112,93	\$ 117,78	

Exhibit 14 – Sensitivity analysis for the share price forecasted using a DCF Valuation

## Comparable Firms and Multiples Analysis

The focus is now to select the criteria defining the comparable firms. PMI leads the sector when it comes to Market Capitalization, surpassing 130 billion dollars by December 2019 and followed by British American Tobacco at a relatively low value of around 98 billion dollars. For this reason, EBITDA margin is a preferable criterion over market capitalization, to find similar companies. Furthermore, EBITDA allows an investor to strip out the companies’ taxes, depreciation/amortization, and interest without losing focus on operating profitability. Geographic diversification and a strong presence at a global scale are other important criteria, as we want to compare PMI with companies that play on the global league of the tobacco market. Another essential factor is that the companies are dedicated to the same core activity: the production and sale of tobacco products, namely combustibles and heated tobacco.

For their reasonable similarity in terms of core activities, EBITDA, EBITDA Margin and global presence, British American Tobacco (BATS), Imperial Brands (IB) and Japan Tobacco Inc. (JTI), have been selected to perform a comparables’ analysis for Philipp Morris.

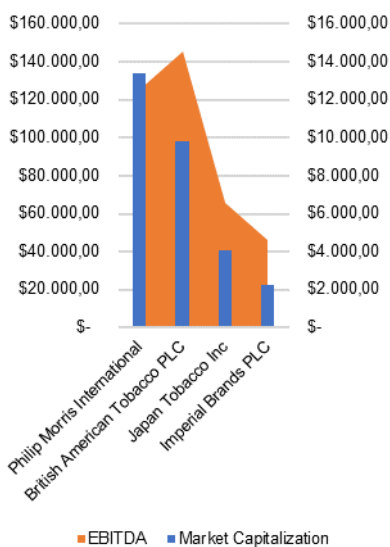
### ▪ Multiples Valuation

As per the rationale given before, British American Tobacco, Japan Tobacco and Imperial Brands will be the peers considered for the analysis. The significant similarities between these companies and PMI will allow us to get a share price for PMI based on the multiples built and the key statistics used.

Before entering the explicit multiples’ valuation, let us highlight some key points that help us build the framework and understand how PMI and its peers are currently positioned in the market according to their financials:

- Philip Morris has the highest market capitalization of the four companies and its total enterprise value amounts to \$161 billion: that is \$3.7 billion higher than British American Tobacco, which detains the second place, 3.3x bigger than Japan Tobacco and 4.3x bigger than Imperial Brands.

Exhibit 15: EBITDA and Market Capitalization of the comparable firms and PMI



Source: Bloomberg

Exhibit 16 – Multiples of PMI and comparable firms

	P/E	EV/EBITDA
PMI	16,9	12,9
BAT	12,2	10,8
JT	11,6	7,4
IB	17,7	8,1

Source: Analyst Estimates – Equity Research report

Exhibit 17 – Implied share price by the Multiples Valuation



Source: Analyst Estimates – Equity Research report

- Concerning EBITDA, the first place belongs to British American Tobacco, with more than \$14 billion versus PMI's \$12.5 billion. Japan Tobacco and Imperial Brands come next, respectively with \$6.6 billion and \$4.6 billion.
- Even though the difference in EBITDA between PMI and British American Tobacco is substantial, it actually shrinks to around \$137,000 when looking at net income. This happens as a consequence of the 80% market share of heated tobacco products of PMI, which presents higher profit margins than cigarettes due to lower taxation. On the other side, British American Tobacco's heated tobacco product (Glo) is relatively new to the markets, as in 2018 it was sold only in 7 countries.

Now we are able to dive into deeper detail and perform a quantitative multiples' valuation.

In terms of methodology, the data for the peers and PMI for deriving the multiples used – Price to Earnings ratio and Enterprise Value to EBITDA ratio – is taken from Bloomberg for the period 2016 – 2019. The minimum, mean and maximum values of both multiples for the peers is determined. Last, we apply those multiples to PMI's financials, weighting the multiples according to the inverse of the weight of the difference between the Market Capitalization of PMI and the other companies – then, the weights are BAT (59%), JT (22%) and IB (19%). This adjustment using a weighted average allows us to give more weight the more similar each peer is to PMI and the less weight the less similar the peer is to PMI. According to this methodology, the results are as follows:

- Price to Earnings ratio gives a mean implied share price for PMI of 103.84\$, that could range from 44.28\$ to 110.04\$.

Philip Morris has the highest Earnings Per Share among its competitors; nevertheless, this measure should not be compared between companies, as it depends on the number of shares outstanding. What really matters is the Price to Earnings ratio (P/E). PMI presents the second highest P/E. Here the analysis can be tricky, as a high P/E has multiple interpretations. The negative part would be that PMI's stock is systematically overvalued, and it would consequently drop sooner or later. The forecasted model shows how the company's share is expected to substantially grow in the coming years. Therefore, the interpretation to PMI's high P/E has to be identified in the high growth rates investors expect for the future, which will translate into higher dividends and an appreciating stock.

- Enterprise Value to EBITDA ratio, attributes PMI a mean implied share price of 109.14\$, moving in a range from 41.78\$ to 143.41\$. The company has an

EV/EBITDA multiple of 12.9, the highest among its peers and therefore above the average of those. Again, this might mean that the company is trading at an overvalued price but might also represent investors' growth expectations for the firm which they are already discounting when trading the stock – we stand for the latter. Furthermore, looking at the period 2014 – 2018, PMI had an average annual multiple of 13.8 which is higher than the current one meaning the company is now creating more value by company unit of value than before.

The results shown in Exhibit 17 are in accordance with the final price obtained with the DCF valuation.

## Financials

In this section the investor will get the insights on the financials of the company. The focus will be on the methodology and drivers used to come up with the forecasts of future financials, including the future free cash flows necessary to perform the DCF valuation.

The DCF valuation is divided into two segments of time: forecasted future Cash Flows for each year until 2028 and the terminal value achieved afterwards.

The first step is consequently to forecast the future cash flows, for which we used revenues as a reference. This was attained by regressing the Net Revenues (including Excise Taxes) of the company into four factors considered to be the value drivers of those – namely, GDP, unemployment, shipment of combustible products and shipment of RRP. From here, one got to the other items composing the financials of the enterprise, allowing us to reach the predicted future free cash flows. The values were then summed to achieve the forecasted total net revenues (including excise taxes) of PMI. A moving average of 5 years was used to forecast the excise taxes rate for future years, which were subtracted from the previous metric, allowing one to obtain the net revenues (excluding excise taxes).

Most items of both the Balance Sheet and the Income Statement were then forecasted by multiplying those net revenues by the average ratio of that item to net revenues for the period 2014 – 2018. Several items, for which we will give further detail below, have been computed through ratios with a different denominator than net revenues.

## Value Drivers and Forecasting Methodology

The methodology to forecast the future free cash flows started by regressing the Net Revenues (including Excise Taxes) of each region on four value drivers (also for each region): Gross Domestic Product, Unemployment, Shipment of Combustible Products and Shipment of RRP.

### Economic Value Drivers: GDP and Unemployment

GDP is one of the most common indicators used to measure economic performance. Even though tobacco is an addictive good with an inelastic demand, according to the literature, the business cycles surely affect tobacco consumption as it is not a primary good. Moreover, GDP represents a good proxy for the overall income in a region and the demand for tobacco products depends on it.

Downturns in economic cycles also lead to increased unemployment reducing the disposable income of the consumers. For that reason, the unemployment rate of the regions has been used as one of the regressors in order to evaluate its relationship with the tobacco consumption.

### Business specific Value Drivers: Shipment of Combustibles and Shipment of RRP

When calculating revenues of PMI, that depend mostly on the sale of cigarettes, one of the main aspects to be considered is certainly the shipment of those. A positive trend in the shipment would mean more cigarettes sold and therefore equal or higher Net Revenues (including excise taxes) assuming no price decreases.

Combustibles are the traditional cigarettes and responsible for most of the shipment of PMI. However, RRP are now their star product and the one they want to sell progressively more in the future. Cannibalization of shipment (and revenues) will necessarily take place, which is possible to consider in the regression by having both shipments as explanatory variables.

### Analysis of the main financial items

- Net Revenues (excluding Excise Taxes)

The output of the regressions predicts a growth of the Net Revenues around 2% until 2024 that then tends to stabilize at 1.4% until 2029.

Asia is by far the region that will sustain a solid growth for Philip Morris, growing around 5% the next three years and stabilizing well above 3%. A fast-paced

rising population that is in a trend of seeing its poverty level disposal income significantly grow year after year will make the continent the source of revenues' growth for PMI.

In contrast, the region that englobes Eastern Europe, Middle East & Africa shows up few growth perspectives for PMI considering the evolution of unemployment, GDP and shipment in this region.

The European Union will be growing below 2% and stabilize at around 0.5% growth rate. Latin America and Canada will grow at a reasonable 3% to stabilize around 0.6%.

- **Excise Taxes**

Excise taxes, whose nature has been previously explained depend mostly on political decisions and are therefore hard to be forecasted considering how subjective it can be. Therefore, for each FY, Excise Taxes are the average ratio of the five previous periods multiplied by the current year's Net Revenues (including Excise Taxes).

- **Costs**

In terms of costs, the cost of sales will keep increasing accompanying revenues and it is assumed that these will be kept at around 36% of Net Revenues (excluding Excise Taxes) as the sell of IQOS will mainly follow the same distribution channels and processes as Combustibles, implying no significant changes.

Administration costs and Marketing, Advertising and Rent expenses are forecasted as a percentage of net revenues and are expected to grow as the introduction of a new product that is still at an early stage tends to affect these items.

Finally, in terms of R&D expenses, also forecasted as a ratio of net revenues, the trend is that these will rise. IQOS and less harmful tobacco products, the future of PMI according to its strategy, implies keeping up with technology and research in order to be the number one brand of these new type of products on a world-wide scale.

- **CAPEX**

Average Capital Expenditures are forecasted to grow at an average rate of 2% during 2020 – 2029 reflecting PMI's strategy of growing and exploring new projects in the development of innovative tobacco products. The shift from combustibles to RRP's expected for the future will be reflected on the need to

adjust the physical assets and processes to the new products. However, due to the similarities in the production and distribution processes, CAPEX will grow at modest rates.

### Analysis of key metrics: growth rate, reinvestment rate and RONIC

The reinvestment rate of Philip Morris International is forecasted to be steady at 11%, meaning that the firm will continue plowing back money in the business as to follow their strategy of keeping-up with the development of new smoking ideas and products. Lower returns on new invested capital will cause the RONIC to move in a down-trend until it reaches around 15% at terminal valuation. These two inputs put the growth rate into downward pressure during the forecasted period achieving a terminal value of 1.6%.

Despite that, RONIC still surpasses the 5.49% terminal WACC forecasted, standing for the premise that PMI will keep generating value. The solid position of the firm not only financially but reputationally and its demonstrated perspicacity to shape the industry and take profit of all surging opportunities, allow one to see a lasting advantage that allied with an industry in a maturity stage with high entry barriers can be seen as a source of potential value creation.

## Final considerations and investment risks

The results of our evaluation are highly positive with a Buy recommendation from both the DCF and the Multiples' Valuation. We believe that the current share price is heavily under-priced by the market. The reason is the great uncertainty surrounding not only PMI, but the whole tobacco industry. In fact, the future developments of the financial results of companies operating in this sector does not entirely depend on their activity. There are many exogenous factors, besides the value drivers, that will have a major impact on PMI's results in the coming year. First of them, regulatory requirement changes due to governmental actions aiming to decrease the overall tobacco consumption. This kind of changes are not only unpredictable, but also heavily diversified per geographic area, as explained above. More specifically, regulation concerning RRP is not well defined yet and there is no clear framework as the one established for cigarettes. PMI is currently succeeding in the differentiation of heated tobacco products from cigarettes with respect to taxation. Nonetheless, it is quite uncertain whether the situation will remain unchanged, especially because it mostly depends on the health implications RRP have and a scientific assessment will require time.

Another risk to consider that can have a negative impact on the forecasts is the foreign exchange risk, to which PMI is highly exposed. The company reports in US dollars, without even operating in the United States because of its separation from the Altria Group. Moreover, US dollars represent the first source of financing for PMI, followed by Euros and Swiss francs, as shown in the annual reports. In addition to this, PMI has a strong presence in emerging markets, where currency fluctuations are more common. Under these circumstances, even the shock to one of these numerous currencies can have a significant impact and the hedging techniques employed by the company may not suffice to cover it - an example is the year 2018, in which PMI lost \$103 million because of unfavourable currency rate changes.

# Appendix

## Financial Statements

### Income Statement

Reformulated Income Statement	2014	2015	2016	2017	2018	2019F	2020F	2021F	2022F	2023F	2024F	2025F	2026F	2027F	2028F	2029F
<b>Core Activity</b>																
<b>Net Revenues</b>																
Total revenue from Combustible products	\$ -	\$ 66	\$ 739	\$ 3,793	\$ 4,252	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Total PMI revenues	\$ 80.106	\$ 73.908	\$ 74.953	\$ 78.098	\$ 79.823	\$ 80.948	\$ 82.808	\$ 84.388	\$ 86.151	\$ 87.918	\$ 89.892	\$ 91.171	\$ 92.470	\$ 93.791	\$ 95.136	\$ 96.508
<b>Excise taxes</b>																
European Union	\$ -21.370	\$ -18.495	\$ -18.987	\$ -19.262	\$ -19.675	\$ -20.034	\$ -20.206	\$ -20.421	\$ -20.688	\$ -20.963	\$ -21.465	\$ -21.510	\$ -21.592	\$ -21.679	\$ -21.775	\$ -21.883
Eastern Europe, Middle East & Africa	\$ -11.855	\$ -10.964	\$ -11.286	\$ -11.346	\$ -11.653	\$ -12.232	\$ -12.531	\$ -12.536	\$ -12.481	\$ -12.378	\$ -12.322	\$ -12.350	\$ -12.342	\$ -12.327	\$ -12.313	\$ -12.312
Asia	\$ -10.527	\$ -11.266	\$ -11.850	\$ -11.845	\$ -12.125	\$ -13.211	\$ -13.836	\$ -14.331	\$ -14.812	\$ -15.564	\$ -16.237	\$ -16.844	\$ -17.442	\$ -18.067	\$ -18.732	\$ -19.378
Latin America & Canada	\$ -6.587	\$ -6.389	\$ -6.165	\$ -6.897	\$ -6.745	\$ -6.605	\$ -6.756	\$ -6.951	\$ -6.156	\$ -6.318	\$ -6.485	\$ -6.528	\$ -6.567	\$ -6.602	\$ -6.637	\$ -6.679
Total Excise Taxes	\$ -50.339	\$ -47.114	\$ -48.268	\$ -49.350	\$ -50.198	\$ -51.081	\$ -52.329	\$ -53.238	\$ -54.137	\$ -55.223	\$ -56.508	\$ -57.232	\$ -57.944	\$ -58.675	\$ -59.458	\$ -60.251
Total net revenues minus excise taxes	\$ 29.767	\$ 26.794	\$ 26.685	\$ 28.748	\$ 29.625	\$ 29.867	\$ 30.479	\$ 31.150	\$ 32.014	\$ 32.696	\$ 33.384	\$ 33.939	\$ 34.526	\$ 35.116	\$ 35.678	\$ 36.256
Cost of sales	\$10.436.00	\$ 9.365.00	\$ 9.391.00	\$10.432.00	\$10.758.00	\$10.621.03	\$10.838.56	\$11.077.27	\$11.384.29	\$11.626.83	\$11.871.64	\$12.069.12	\$12.277.85	\$12.487.44	\$12.687.50	\$12.893.05
Gross profit	\$ 19.331	\$ 17.429	\$ 17.294	\$ 18.316	\$ 18.867	\$ 19.246	\$ 19.640	\$ 20.073	\$ 20.629	\$ 21.069	\$ 21.512	\$ 21.870	\$ 22.248	\$ 22.628	\$ 22.991	\$ 23.363
Administration costs and Marketing	\$ -4.997.00	\$ -4.827.00	\$ -4.618.00	\$ -4.342.00	\$ -4.851.00	\$ -5.013.13	\$ -5.115.80	\$ -5.228.47	\$ -5.373.39	\$ -5.467.87	\$ -5.603.42	\$ -5.696.63	\$ -5.795.15	\$ -5.894.08	\$ -5.998.50	\$ -6.085.52
Advertising expenses	\$ -439.00	\$ -448.00	\$ -405.00	\$ -390.00	\$ -896.00	\$ -631.76	\$ 644.70	\$ -658.90	\$ -677.16	\$ -691.59	\$ -706.15	\$ -717.89	\$ -730.31	\$ -742.78	\$ -754.68	\$ -766.90
Rent expenses	\$ -336.00	\$ -286.00	\$ -284.00	\$ -313.00	\$ -312.00	\$ -322.71	\$ -329.32	\$ -336.57	\$ -345.90	\$ -353.27	\$ -360.71	\$ -366.71	\$ -373.05	\$ -379.42	\$ -385.49	\$ -391.74
R&D expenses	\$ -433.00	\$ -423.00	\$ -429.00	\$ -453.00	\$ -383.00	\$ -448.58	\$ -457.77	\$ -467.85	\$ -480.82	\$ -491.06	\$ -501.40	\$ -509.74	\$ -518.56	\$ -527.41	\$ -535.86	\$ -544.54
EBITDA	\$ 13.126	\$ 11.445	\$ 11.558	\$ 12.378	\$ 12.325	\$ 12.830	\$ 13.093	\$ 13.381	\$ 13.752	\$ 14.045	\$ 14.341	\$ 14.579	\$ 14.831	\$ 15.085	\$ 15.236	\$ 15.574
Amortization of intangibles	\$ -93.00	\$ -82.00	\$ -74.00	\$ -88.00	\$ -82.00	\$ -88.91	\$ -90.73	\$ -92.72	\$ -95.29	\$ -97.32	\$ -99.37	\$ -101.03	\$ -102.77	\$ -104.53	\$ -106.20	\$ -107.92
Depreciation	\$ -796.00	\$ -672.00	\$ -669.00	\$ -787.00	\$ -907.00	\$ -808.26	\$ -824.81	\$ -842.98	\$ -866.34	\$ -884.80	\$ -903.43	\$ -918.46	\$ -934.34	\$ -950.29	\$ -965.52	\$ -981.16
EBIT (Operating income)	\$ 12.237	\$ 10.691	\$ 10.815	\$ 11.503	\$ 11.336	\$ 11.933	\$ 12.177	\$ 12.445	\$ 12.790	\$ 13.063	\$ 13.338	\$ 13.594	\$ 13.794	\$ 14.030	\$ 14.254	\$ 14.485
Recurrent Operational taxes	\$ 3,000.15	\$ 2,559.21	\$ 2,534.83	\$ 2,734.19	\$ 2,519.28	\$ 2,834.18	\$ 2,892.22	\$ 2,955.92	\$ 3,037.85	\$ 3,127.57	\$ 3,167.90	\$ 3,220.59	\$ 3,276.29	\$ 3,332.22	\$ 3,385.61	\$ 3,440.46
Non-recurrent operational taxes	\$ 562.29	\$ 505.39	\$ 545.02	\$ 1,892.69	\$ 2,519.28	\$ 752.15	\$ 767.56	\$ 784.46	\$ 806.21	\$ 823.38	\$ 840.72	\$ 854.70	\$ 869.48	\$ 884.33	\$ 898.49	\$ 913.05
NOPLAT	\$ 8.585	\$ 7.626	\$ 7.735	\$ 6.876	\$ 8.760	\$ 8.346	\$ 8.517	\$ 8.705	\$ 8.946	\$ 9.137	\$ 9.329	\$ 9.484	\$ 9.648	\$ 9.813	\$ 9.970	\$ 10.132
<b>Non-Core Activity</b>																
Asset Impairment and exit costs	\$ -535.00	\$ -68.00	\$ -	\$ -	\$ -	\$ -122.52	\$ -125.03	\$ -127.78	\$ -131.32	\$ -134.12	\$ -136.95	\$ -139.22	\$ -141.63	\$ -144.05	\$ -146.36	\$ -148.73
Interest expense, net (derivatives not designated as hedging instruments)	\$ -	\$ -1.00	\$ -24.00	\$ -60.00	\$ 62.00	\$ -5.56	\$ -5.68	\$ -5.80	\$ -5.96	\$ -6.09	\$ -6.22	\$ -6.32	\$ -6.43	\$ -6.54	\$ -6.64	\$ -6.75
Non-core Activity before taxes	\$ -535.00	\$ -69.00	\$ -24.00	\$ -60.00	\$ 62.00	\$ -128.08	\$ -131.71	\$ -134.58	\$ -137.28	\$ -140.21	\$ -143.17	\$ -146.14	\$ -149.18	\$ -152.15	\$ -155.13	\$ -158.15
Advertising expenses	\$ 187.00	\$ 24.00	\$ 3.00	\$ 21.00	\$ -22.00	\$ 44.59	\$ 45.51	\$ 46.51	\$ 47.80	\$ 48.92	\$ 49.85	\$ 50.67	\$ 51.55	\$ 52.43	\$ 53.27	\$ 54.13
Non-core Activity after taxes	\$ -348.00	\$ -45.00	\$ -16.00	\$ -39.00	\$ 40.00	\$ -83.49	\$ -86.20	\$ -88.07	\$ -89.48	\$ -91.29	\$ -93.32	\$ -95.47	\$ -97.63	\$ -99.78	\$ -101.90	\$ -104.02
Equity income/loss in unconsolidated subsidiaries, net	\$ 105.00	\$ 105.00	\$ 94.00	\$ 59.00	\$ 60.00	\$ 89.88	\$ 91.72	\$ 93.74	\$ 96.34	\$ 98.39	\$ 100.46	\$ 102.13	\$ 103.90	\$ 105.67	\$ 107.37	\$ 109.11
Other comprehensive income:																
Change in currency transaction adjustments	\$ -1,751.00	\$ -2,249.00	\$ -9.00	\$ 328.00	\$ -812.00	\$ -950.36	\$ -969.82	\$ -991.18	\$ -1,018.65	\$ -1,040.35	\$ -1,062.26	\$ -1,079.93	\$ -1,098.61	\$ -1,117.36	\$ -1,135.26	\$ -1,153.65
Change in net loss and prior service cost	\$ -875.00	\$ -309.00	\$ -236.00	\$ 751.00	\$ -828.00	\$ -328.28	\$ -335.00	\$ -342.38	\$ -351.87	\$ -359.37	\$ -366.93	\$ -373.04	\$ -379.49	\$ -385.97	\$ -392.15	\$ -398.50
Change in fair value of derivatives accounted for as hedges	\$ 60.00	\$ -64.00	\$ 38.00	\$ -55.00	\$ -7.00	\$ -6.56	\$ -6.70	\$ -6.84	\$ -7.03	\$ -7.18	\$ -7.33	\$ -7.46	\$ -7.58	\$ -7.71	\$ -7.84	\$ -7.96
Non-core result	\$ -2,909	\$ -2,562	\$ -129	\$ 1,044	\$ -1,547	\$ -1,279	\$ -1,305	\$ -1,334	\$ -1,371	\$ -1,400	\$ -1,429	\$ -1,453	\$ -1,478	\$ -1,504	\$ -1,528	\$ -1,552
<b>Financial</b>																
Interest expense, net (derivatives not designated as hedging instruments)	\$ -1,052.00	\$ -1,007.00	\$ -867.00	\$ -854.00	\$ -727.00	\$ -960.53	\$ -980.20	\$ -1,001.79	\$ -1,029.55	\$ -1,051.49	\$ -1,073.63	\$ -1,091.48	\$ -1,110.36	\$ -1,129.32	\$ -1,147.41	\$ -1,166.00
Interest Tax Shield	\$ 368.20	\$ 352.45	\$ 303.45	\$ 298.90	\$ 152.67	\$ 313.28	\$ 319.70	\$ 326.74	\$ 335.79	\$ 342.95	\$ 350.17	\$ 355.99	\$ 362.15	\$ 368.33	\$ 374.23	\$ 380.30
Financial result	\$ -684	\$ -655	\$ -564	\$ -555	\$ -574	\$ -647	\$ -661	\$ -675	\$ -694	\$ -709	\$ -723	\$ -735	\$ -748	\$ -761	\$ -773	\$ -786
Total Comprehensive Income	\$ 4.992	\$ 4.410	\$ 7.043	\$ 7.385	\$ 6.639	\$ 6.420	\$ 6.552	\$ 6.696	\$ 6.882	\$ 7.028	\$ 7.176	\$ 7.296	\$ 7.422	\$ 7.549	\$ 7.670	\$ 7.794

### Balance Sheet

Reformulated Balance Sheet	2014	2015	2016	2017	2018	2019F	2020F	2021F	2022	2023	2024	2025	2026	2027	2028	2029
<b>Core Activity</b>																
<b>Operating Assets</b>																
Operating cash	\$ 595	\$ 536	\$ 534	\$ 575	\$ 593	\$ 597	\$ 610	\$ 623	\$ 640	\$ 654	\$ 668	\$ 679	\$ 691	\$ 702	\$ 714	\$ 725
Receivables, net	\$ 3,497	\$ 2,614	\$ 3,210	\$ 3,380	\$ 3,256	\$ 3,362	\$ 3,431	\$ 3,506	\$ 3,604	\$ 3,680	\$ 3,758	\$ 3,820	\$ 3,886	\$ 3,953	\$ 4,016	\$ 4,081
Inventories	\$ 8,592	\$ 8,473	\$ 9,017	\$ 8,806	\$ 8,804	\$ 9,237	\$ 9,426	\$ 9,633	\$ 9,900	\$ 10,111	\$ 10,324	\$ 10,496	\$ 10,677	\$ 10,860	\$ 11,034	\$ 11,212
Other current assets	\$ 391	\$ 340	\$ 485	\$ 497	\$ 360	\$ 439	\$ 448	\$ 458	\$ 470	\$ 480	\$ 490	\$ 498	\$ 507	\$ 516	\$ 524	\$ 533
Property, plant and equipment	\$ 6,071	\$ 5,721	\$ 6,064	\$ 7,271	\$ 7,201	\$ 6,814	\$ 6,953	\$ 7,107	\$ 7,304	\$ 7,459	\$ 7,616	\$ 7,743	\$ 7,877	\$ 8,011	\$ 8,140	\$ 8,272
Goodwill	\$ 8,388	\$ 7,415	\$ 7,324	\$ 7,666	\$ 7,189	\$ 6,931	\$ 6,881	\$ 6,441	\$ 6,210	\$ 5,986	\$ 5,771	\$ 5,564	\$ 5,364	\$ 5,171	\$ 4,985	\$ 4,806
Other intangible assets	\$ 2,985	\$ 2,623	\$ 2,470	\$ 2,432	\$ 2,278	\$ 2,701	\$ 2,757	\$ 2,817	\$ 2,895	\$ 2,957	\$ 3,019	\$ 3,074	\$ 3,123	\$ 3,176	\$ 3,227	\$ 3,279
Deferred income taxes	\$ 533	\$ 488	\$ 859	\$ 1,007	\$ 977	\$ 814	\$ 831	\$ 849	\$ 873	\$ 891	\$ 910	\$ 925	\$ 941	\$ 957	\$ 973	\$ 988
Other assets	\$ 1,010	\$ 1,190	\$ 1,037	\$ 1,843	\$ 1,309	\$ 1,347	\$ 1,375	\$ 1,405	\$ 1,444	\$ 1,475	\$ 1,506	\$ 1,531	\$ 1,557	\$ 1,584	\$ 1,609	\$ 1,635
Total operating assets	\$ 32,062	\$ 29,400	\$ 31,000	\$ 33,477	\$ 31,967	\$ 32,242	\$ 32,511	\$ 32,840	\$ 33,340	\$ 33,694	\$ 34,063	\$ 34,326	\$ 34,623	\$ 34,930	\$ 35,221	\$ 35,531
<b>Operating Liabilities</b>																
Accounts payable	\$ 1,242	\$ 1,289	\$ 1,666	\$ 2,242	\$ 2,068	\$ 1,792	\$ 1,829	\$ 1,869	\$ 1,921	\$ 1,962	\$ 2,003	\$ 2,037	\$ 2,072	\$ 2,107	\$ 2,141	\$ 2,176
Accrued liabilities:																
Marketing and selling	\$ 549	\$ 640	\$ 575	\$ 708	\$ 732	\$ 676	\$ 690	\$ 705	\$ 725	\$ 740	\$ 756	\$ 768	\$ 782	\$ 795	\$ 808	\$ 821
Taxes, except income taxes	\$ 5,490	\$ 5,121	\$ 6,204	\$ 5,324	\$ 5,088	\$ 5,764	\$ 5,882	\$ 6,012	\$ 6,179	\$ 6,310	\$ 6,443	\$ 6,550	\$ 6,663	\$ 6,777	\$ 6,886	\$ 6,997
Employment costs	\$ 1,070	\$ 871	\$ 767	\$ 820	\$ 764	\$ 905	\$ 924	\$ 944	\$ 970	\$ 991	\$ 1,012	\$ 1,028	\$ 1,046	\$ 1,064	\$ 1,081	\$ 1,099
Other:																
Warranty obligations	\$ -	\$ -	\$ -	\$ 71	\$ 67	\$ 28	\$ 29	\$ 29	\$ 30	\$ 31	\$ 32	\$ 32	\$ 33	\$ 33	\$ 34	\$ 34
Other	\$ 1,249	\$ 1,383	\$ 1,426	\$ 1,041	\$ 1,206	\$ 1,338	\$ 1,365	\$ 1,395	\$ 1,434	\$ 1,464	\$ 1,495	\$ 1,520	\$ 1,546	\$ 1,573	\$ 1,598	\$ 1,624
Income taxes	\$ 1,078	\$ 970	\$ 832	\$ 812	\$ 576	\$ 904	\$ 922	\$ 943	\$ 969	\$ 989	\$ 1,010	\$ 1,027	\$ 1,045	\$ 1,062	\$ 1,080	\$ 1,097
Deferred income taxes	\$ 1,707	\$ 1,749	\$ 1,897	\$ 799	\$ 898	\$ 1,504	\$ 1,535	\$ 1,569	\$ 1,612	\$ 1,647	\$ 1,681	\$ 1,709	\$ 1,739	\$ 1,769	\$ 1,797	\$ 1,826
Employment costs	\$ 633	\$ 658	\$ 643	\$ 582	\$ 603	\$ 660	\$ 674	\$ 689	\$ 708	\$ 723	\$ 738	\$ 750	\$ 763			

Cash Flows

Cash Flows	2015	2016	2017	2018	2019F	2020F	2021F	2022F	2023F	2024F	2025F	2026F	2027F	2028F	2029F
<b>Core Business</b>															
EBIT	\$ 10,691	\$ 10,815	\$ 11,503	\$ 11,336	\$ 11,933	\$ 12,177	\$ 12,445	\$ 12,790	\$ 13,063	\$ 13,338	\$ 13,560	\$ 13,794	\$ 14,030	\$ 14,254	\$ 14,485
Recurrent taxes	\$ -2,559	\$ -2,535	\$ -2,734	\$ -2,519	\$ -2,834	\$ -2,892	\$ -2,956	\$ -3,038	\$ -3,103	\$ -3,168	\$ -3,221	\$ -3,276	\$ -3,332	\$ -3,386	\$ -3,440
Non-recurrent taxes	\$ -505	\$ -545	\$ -1,893	\$ -56	\$ -752	\$ -768	\$ -784	\$ -806	\$ -823	\$ -841	\$ -855	\$ -869	\$ -884	\$ -898	\$ -913
NOPLAT	\$ 7,626	\$ 7,735	\$ 6,876	\$ 8,760	\$ 8,346	\$ 8,517	\$ 8,705	\$ 8,946	\$ 9,137	\$ 9,329	\$ 9,484	\$ 9,648	\$ 9,813	\$ 9,970	\$ 10,132
D&A	\$ 754	\$ 743	\$ 875	\$ 989	\$ 897	\$ 916	\$ 936	\$ 962	\$ 982	\$ 1,003	\$ 1,019	\$ 1,037	\$ 1,055	\$ 1,072	\$ 1,089
Operational Cash Flow	\$ 8,380	\$ 8,478	\$ 7,751	\$ 9,749	\$ 9,244	\$ 9,433	\$ 9,641	\$ 9,908	\$ 10,119	\$ 10,332	\$ 10,504	\$ 10,686	\$ 10,868	\$ 11,042	\$ 11,221
Net CAPEX	\$ -404	\$ -1,086	\$ -2,082	\$ -919	\$ -510	\$ -1,055	\$ -1,089	\$ -1,159	\$ -1,138	\$ -1,160	\$ -1,146	\$ -1,171	\$ -1,189	\$ -1,200	\$ -1,221
CF change from NWC	\$ 708	\$ -87	\$ -464	\$ -272	\$ 285	\$ -46	\$ -50	\$ -64	\$ -51	\$ -51	\$ -41	\$ -44	\$ -44	\$ -42	\$ -43
CF change from other operating assets	\$ 1,200	\$ 26	\$ -1,258	\$ 1,195	\$ -40	\$ 150	\$ 131	\$ 91	\$ 112	\$ 103	\$ 117	\$ 104	\$ 97	\$ 94	\$ 85
CF change from other operating liabilities	\$ 57	\$ 363	\$ 79	\$ 37	\$ -57	\$ 68	\$ 74	\$ 95	\$ 75	\$ 76	\$ 61	\$ 65	\$ 65	\$ 62	\$ 64
Investment Cash Flow	\$ 1,561	\$ -784	\$ -3,725	\$ 41	\$ -323	\$ -884	\$ -934	\$ -1,037	\$ -1,001	\$ -1,032	\$ -1,009	\$ -1,046	\$ -1,071	\$ -1,086	\$ -1,115
<b>Unlevered Operational Free Cash Flow</b>	<b>\$ 9,942</b>	<b>\$ 7,694</b>	<b>\$ 4,026</b>	<b>\$ 9,791</b>	<b>\$ 8,921</b>	<b>\$ 8,549</b>	<b>\$ 8,707</b>	<b>\$ 8,871</b>	<b>\$ 9,118</b>	<b>\$ 9,300</b>	<b>\$ 9,495</b>	<b>\$ 9,640</b>	<b>\$ 9,797</b>	<b>\$ 9,957</b>	<b>\$ 10,106</b>
<b>Non-Core Business</b>															
Operational Cash Flow	\$ -2,562	\$ -129	\$ 1,044	\$ -1,547	\$ -1,279	\$ -1,305	\$ -1,334	\$ -1,371	\$ -1,400	\$ -1,429	\$ -1,453	\$ -1,478	\$ -1,504	\$ -1,528	\$ -1,552
Investment Cash Flow	\$ 391	\$ -680	\$ 1,492	\$ -712	\$ -216	\$ -87	\$ -91	\$ -92	\$ -101	\$ -107	\$ -115	\$ -120	\$ -127	\$ -134	\$ -141
<b>Non-Operational Free Cash Flow</b>	<b>\$ -2,171</b>	<b>\$ -809</b>	<b>\$ 2,536</b>	<b>\$ -2,259</b>	<b>\$ -1,495</b>	<b>\$ -1,392</b>	<b>\$ -1,424</b>	<b>\$ -1,463</b>	<b>\$ -1,501</b>	<b>\$ -1,536</b>	<b>\$ -1,568</b>	<b>\$ -1,599</b>	<b>\$ -1,631</b>	<b>\$ -1,662</b>	<b>\$ -1,694</b>
<b>Total Free Cash Flow</b>	<b>\$ 7,771</b>	<b>\$ 6,885</b>	<b>\$ 6,562</b>	<b>\$ 7,532</b>	<b>\$ 7,426</b>	<b>\$ 7,158</b>	<b>\$ 7,283</b>	<b>\$ 7,408</b>	<b>\$ 7,617</b>	<b>\$ 7,764</b>	<b>\$ 7,927</b>	<b>\$ 8,041</b>	<b>\$ 8,166</b>	<b>\$ 8,295</b>	<b>\$ 8,412</b>
<b>Financial</b>															
Financial Result	\$ -1,007	\$ -867	\$ -854	\$ -727	\$ -961	\$ -980	\$ -1,002	\$ -1,030	\$ -1,051	\$ -1,074	\$ -1,091	\$ -1,110	\$ -1,129	\$ -1,147	\$ -1,166
Tax Shield	\$ 352	\$ 303	\$ 299	\$ 153	\$ 313	\$ 320	\$ 327	\$ 336	\$ 343	\$ 350	\$ 356	\$ 362	\$ 368	\$ 374	\$ 380
Investment in Net Financial Assets	\$ -2,121	\$ 133	\$ 708	\$ -59	\$ 1,668	\$ 648	\$ 711	\$ 915	\$ 723	\$ 730	\$ 589	\$ 622	\$ 625	\$ 596	\$ 613
Change in Equity cash	\$ -4,995	\$ -6,455	\$ -6,715	\$ -6,898	\$ -8,447	\$ -7,145	\$ -7,319	\$ -7,629	\$ -7,631	\$ -7,770	\$ -7,780	\$ -7,915	\$ -8,030	\$ -8,118	\$ -8,239
<b>Financial Free Cash Flow</b>	<b>\$ -7,771</b>	<b>\$ -6,885</b>	<b>\$ -6,562</b>	<b>\$ -7,532</b>	<b>\$ -7,426</b>	<b>\$ -7,158</b>	<b>\$ -7,283</b>	<b>\$ -7,408</b>	<b>\$ -7,617</b>	<b>\$ -7,764</b>	<b>\$ -7,927</b>	<b>\$ -8,041</b>	<b>\$ -8,166</b>	<b>\$ -8,295</b>	<b>\$ -8,412</b>

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<b>Buy</b>	Expected total return (including expected capital gains and expected dividend yield) of more than 10% over a 12-month period.
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A Work Project, presented as part of the requirements for the Award of a Master's degree in Economics / Finance / Management from the Nova School of Business and Economics.

## THE EFFECTIVENESS OF TOBACCO RESTRICTION POLICIES

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**Abstract**

This paper serves the purpose of studying the effectiveness of the main legal frameworks applied by governments around the world to try to control the consumption of tobacco products by their citizens. The significance and magnitude that usual control policies (such as Excise Taxation, Advertisement and Promotion bans to tobacco products and Help Services to quit smoking) have on the reduction of the share of smokers will be assessed.

**Keywords:** Excise taxes, Tobacco industry, Advertisement bans, Quit smoking services

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Tobacco is to blame for more than 8 million deaths yearly, according to the World Health Organization – 7 million as a result of direct tobacco and around 1.2 million as a result of non-smokers exposure to smoke.

The same organization estimates that tobacco consumption total economic cost (including health expenditure, productivity loss and other consequences) is roughly 1.4 trillion US dollars each year, which corresponds to almost 2% of the world GDP.

The harmful nature of tobacco products has been known for a long time and its above mentioned main negative consequences have made it a become an industry subject to all forms of government controls – mainly under the form of taxation, bans on advertisement and consumption, and helping quit smoking services.

From the literature and empirical data, it is clear that the more developed economies are leading the way in applying stricter regulatory frameworks for the consumption of these products. It is hard to argue that higher taxation which results in higher priced tobacco as the tax burden is almost always mostly supported by the consumer and bans to the promotion of tobacco as well as support to smokers who want to quit do not have an effect on reducing smoking prevalence. However, it might be interesting for one to better understand which of these policies are more effective. The more effective policies will potentially be the ones applied in the future when governments of developing economies apply similar tobacco control frameworks as well as the way forward for the developed countries reforms of legal basis. Therefore, investors of Philip Morris International should pay special attention to the topic and

understand what will be the star measures of governments in the coming years to try to decrease tobacco consumption – as well as its consequences for the valuation of the company, since it is an heavily regulated market.

In order to assess the effectiveness of those policies, one can consider regressing the difference in the share of smokers between 2000 and 2014 (y) in each country, in each country’s respective explanatory variables: Total taxes as a % of cigarette price (x\_1), Enforce bans on tobacco advertising (1 to 5, with stricter bans if 5) (x\_2) and Help offered to quit tobacco (1 to 5, with more and better quality help offered if 5) (x\_3).

The regression is conducted with data for 94 countries available at *Our World in Data*.

T-testing at 90% significance suggests one should not include the bans on tobacco advertising in the regression. Therefore, a new regression has been put in place with the two other explanatory variables only. The results are presented in Exhibit 1.

*Exhibit 1 – Regression to assess the significance and magnitude of tobacco consumption control policies on the decrease of the share of smokers (2000 - 2014)*

		Offer help to quit tobacco use	Taxes as a % of cigarette price	Beta
R1	Coefficients	-0,016	-0,069	0,041
	Standard errors	0,009	0,033	0,034
	R <sup>2</sup> /Sev	0,121		
	F/df	6		
	T test	-1,845411	-2,0881787	

Interpreting the results leads to the following conclusions:

The regression has a low significance of 12.1% (measured through the R squared), which is normal as the explained variable which we use as a measure of tobacco consumption in the countries is explained by a lot of

other factors apart from the control policies. Some examples could be the income, education, and consciousness of tobacco nature which affect how many people have started and quitted smoking in the 14 years period of study.

Taxes on cigarretes and offer to quit smoking programs are statistically significant in defining the prevalence of smoking in a society, at a 90% significance level. The regression is also jointly significant by performing an F test at a 90% significance level which rejects the null hypothesis that the explanatory variables’ coefficients are all zero. The equation would then be:

$$y = 0.041 - 0.069x_1 - 0.016x_3 \qquad \text{Equation (1)}$$

Analyzing the meaning of the coefficients, in a society with no taxes on tobacco and no services to help quit smoking, the share of smokers would be 4.10 percentual points (i.e. p.p.) higher in 2014 than in 2000. As in the last 14 years a significant share of the world population has left poverty and, in general, the income per person has been increasing (specially in developing countries), this is an expectable result as with more income the tobacco consumption should rise, especially with no control policies in place.

The coefficient of the variable “Offer help to quit tobacco use” is -0.016, meaning that for each one-unit increase (from 1 to 5) in this variable, the smoking population would be 1.6 (p.p.) less in 2014 than in 2000.

The coefficient of the variable “Taxes as a % of cigarette price” is -.069, which also means that the higher the tax rate the bigger the (negative) difference between the smoking prevalence in 2014 and 2000.

Exhibit 2 provides the change in the share of smoking population (2000 - 2014) for different values of the explanatory variables and considering the 4.1 (p.p.) increase of the regression beta.

*Exhibit 2 – Combined effect of different levels of the explanatory variables in the reduction of the share of tobacco smokers according to the results of the regression in Exhibit 1.*

		Offer help to quit tobacco use				
		1	2	3	4	5
Taxes as a % of cigarette price	10%	1,8%	0,1%	-1,5%	-3,1%	-4,8%
	20%	1,1%	-0,6%	-2,2%	-3,8%	-5,5%
	30%	0,4%	-1,3%	-2,9%	-4,5%	-6,1%
	40%	-0,3%	-1,9%	-3,6%	-5,2%	-6,8%
	50%	-1,0%	-2,6%	-4,3%	-5,9%	-7,5%
	60%	-1,7%	-3,3%	-5,0%	-6,6%	-8,2%
	70%	-2,4%	-4,0%	-5,6%	-7,3%	-8,9%
	80%	-3,1%	-4,7%	-6,3%	-8,0%	-9,6%
	90%	-3,8%	-5,4%	-7,0%	-8,7%	-10,3%

While a country with 10% taxation and level 1 quitting service would have seen its smoking population increase in 1.8 p.p., one with 90% taxation and level 5 quitting service would have seen the prevalence of smoking 10.3 p.p. below in 2014 compared to 2000.

The main conclusions from this analysis are that Taxation of tobacco and Offer help to quit smoking are two statistically significant variables when it comes to reducing the smoking population of a country. The former with more significance and bigger magnitude (coefficient) on the explained variable. Tobacco advertisement bans were found (with this data) not statistically significant in explaining the difference in the share of smoking population between 2000 and 2014. However, an investor

should not disregard this type of measures completely, as the promotion of IQOS in Asia has led to higher customer acquisition to RRPs than in other regions where advertisement was not allowed.

The trend seems to be that in the coming years, and as countries develop, governments will adopt stricter policies on tobacco consumption and use higher taxation as its main measure, since it appears to be the policy having a bigger impact in combating the industry of tobacco. Offer help to quit smoking would also be interesting to apply should this study be considered. As hard as it might be to forecast exactly the moves of governments in this field, investors should consider these factors as extremely important to evaluate the future of companies in the tobacco industry, as is the case of Philip Morris International. However, the shift that the big players are making to potentially less harmful products might also be seen as a way the industry is investing into to face the trend of rising government controls to traditional tobacco consumption and might end-up being a way for these companies to enter a new era of less regulated tobacco products – which would be brand new land for opportunities in this market.