ASSESSMENT OF THE EUROPEAN COMMISSION’S PRELIMINARY FINDINGS ON MERCHANTS’ COSTS OF CASH AND CARDS

PREPARED FOR
MasterCard

PREPARED BY
Lucia Bazzucchi, The Brattle Group
Daniele Condorelli, University of Essex
Francesco Lo Passo, The Brattle Group

April 2014
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ABSTRACT

On February 19, 2014, the European Commission (EC) presented the preliminary results of its survey on merchant payment costs, which it conducted in order to implement the merchant indifference test (MIT). The EC collected cost data on about 250 large merchants, representing a substantial share of retail sales in Europe. The MIT was executed using data on the marginal cost of one additional transaction performed with either card or cash payment. The results of the MIT are preliminary, primarily because small- and medium-sized merchants have been excluded from the analysis, and indicate test-compliant interchange fees of less than 0.2% of the transaction value for both debit and credit cards. In this note, we review the findings of the EC and discuss their methodology for collecting the data and implementing the merchant indifference test. We raise a number of concerns about the way in which the EC has decided to implement the test. In light of these concerns and of our previous work on the MIT using Italian data (where we identified MIT compliant interchange fees to be well above 1%) we conclude that the raw data on large merchants collected by the EC may be consistent with MIT compliant interchange fees for the entire population of merchants substantially above the 0.2%/0.3% thresholds, which now serve as basis for the current EC draft regulation. Ultimately, for these and other reasons we have discussed elsewhere, we don’t believe that the current results by the EC provide enough support to regulate the European card payment market - especially in light of the best practices so far adopted by the EC to intervene in other sectors.
EXECUTIVE SUMMARY

In the recent years, a number of important decisions have been made on multilateral interchange fees (henceforth also “MIFs”) by competition authorities and regulatory bodies; these decisions have substantially affected the competitive dynamics of the European card payment market. Following the 2007 MasterCard decision by the European Commission (henceforth also “EC”), total cross-border interchange revenue collected from MasterCard consumer debit and credit cards has been capped at 0.2% and 0.3%, respectively, of the value of processed transactions. Following decisions in 2010 and 2014, MIFs for Visa Europe, interchange revenue from consumer debit cards and credit cards has been capped at 0.2% and 0.3% respectively, both for cross-border transactions and for domestic transactions in various European countries. Beyond these EC cases, interchange fees have been under scrutiny in a number of jurisdictions across Europe.

Recently, the EC has proposed a draft regulation that would require four-party schemes to apply interchange fees equal to 0.2% and 0.3% of the transaction value to all debit and credit card transactions, respectively.1

According to the EC, both its competition decisions and the draft regulation have been based on the concept of the merchant indifference test (henceforth also “MIT”). Roughly speaking, interchange fees pass the MIT if the average merchant does not lose money when transactions are conducted with cards rather than cash, assuming that the transactions would take place regardless of payment method.2 The test advances the idea that consumers, who make payment decisions, must internalize the externality that they impose on merchants. The test was proposed in Rochet and Tirole (2011), based on an idea from Baxter (1983).

We have expressed elsewhere our arguments against the idea of regulating the card payment market based on the MIT, and we only briefly touch on these points in this report: (i) the MIT is based on very simplistic model of the payment market (e.g., competition among payment schemes is abstracted away, potential missed sales arising for consumers who have no cash in hand at the point of sale are not accounted for, the positive external effects of traceable card transactions are neglected, etc.) and therefore there is no guarantee that, even if properly implemented, welfare will increase as a result of regulating interchange based on it; (ii) even if one accepts the underlying model as adequate, getting the test right requires a lot of information on hard to measure variables (e.g. pass-through rates, demand functions, etc.) - hence the risk of producing a number substantially different from the “optimal” one is large and should be properly evaluated before tampering with market forces; (iii) the MIT is

1 We remark that, in contrast with previous competition decisions, the draft regulation does not allow any flexibility in differentiating interchange fees by card type or merchant category.

2 In practice, the MIT compliant interchange fee is computed as the difference between the estimated per-euro merchant’s cost of handling the transaction with cash and the estimated per-euro cost of handling the transaction with card net of the prevailing average interchange fee.
not the correct benchmark when the issuing market is not competitive or the regulator wants to maximize total welfare (rather than the welfare of retailers and cardholders only); (iv) the test is not adequate when it comes to regulating card-not-present transactions (where cash is not an alternative option to cards) and credit cards (in which case the cost of cards should be compared to the cost of offering in-store credit).

In order to perform the MIT and determine numeric figures for interchange fee benchmarks, the EC previously used national cost studies conducted by European central banks on the social costs of different payment methods. Faced with mounting discomfort at the idea of regulating the market using only aggregate-level data originally collected for a different purpose, in 2008 the EC decided to start a large-scale data gathering process with the aim of implementing the MIT. The work was entrusted to EIM Consulting, but the Commission never shared any results from this study publicly.

In 2012, the EC commissioned two additional surveys by Deloitte Consulting. The first survey was intended to gather detailed cost data for 500 large merchants in 10 European countries. The second survey was designed to gather data on the volume and value of card and cash payments of all merchant sizes in those same 10 European countries. After starting the data collection in 2013, Deloitte recently delivered the final datasets to the EC.

Therefore, with the aim of informing stakeholders and providing support for the draft regulation, the EC shared its preliminary results of the implementation of the MIT on February 19, 2014. The EC presented results on MIT-compliant MIFs based on cost data of large merchants from the first Deloitte survey. The data cover a sample of 253 retailers, each with revenues exceeding 20 million euro, representing about 13% of European retail trade.

The MIT was then implemented for two different scenarios using a marginal cost approach. In the first scenario, the EC asked about the costs generated by a single additional transaction paid with card and cash. In the second scenario, the EC asked about the extra cost of a single transaction, but this time including all those costs that would vary, in principle, if there were a larger shift in transactions for a prolonged period of time. The main results of the analysis are reported in the following table:

<table>
<thead>
<tr>
<th>Scenario 1</th>
<th>Scenario 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Debit</td>
<td>Credit</td>
</tr>
<tr>
<td>MIT Compliant MIF*</td>
<td>0.02%</td>
</tr>
</tbody>
</table>

Notes & Sources:
EC, Survey on Merchants’ Costs of Processing Cash and Card Payments, (February 2014); * Values in % of transacted value

3 For more on these issues see: Condorelli and Piccolo (2012); Condorelli (2013a); Condorelli (2013b).
Even though the EC has stressed the preliminary nature of these results, mostly due to its exclusive focus on large merchants, it has also stated that results are not inconsistent with 0.2%/0.3% thresholds included in the above-mentioned draft regulation and adopted in the context of earlier competition decisions.

In this note we review the preliminary findings of the EC and its methodology. We conclude that the results are consistent with MIF values which are well above those thresholds for the European market.

On data gathering we make the following observations:

a) The sample is not representative of the whole population of merchants in Europe, nor of the population of large merchants (across countries, across activity sectors, and across turnover). While the focus on large merchants was a planned feature of the survey, the fact that the sample is not representative of large merchants even across sectors and countries makes it difficult to understand exactly what out-of-sample conclusions can be drawn from the EC’s results.

b) While ex-post stratification could correct the arising bias by treating the sample as random with respect to the sector of activity and geographic location, the absence of any data points on small merchants is especially troublesome. To the best of our understanding, the EC is not collecting any additional data on small merchants besides data on the usage of payment instruments. Because it is both obvious and proven by existing data that there are substantial economies of scale in payment systems (for both cash and cards), it is not clear how these limited data on costs can at all be used to infer costs for small merchants and, therefore, be applied to determine MIT-compliant MIFs applicable to the entire European market.

c) Despite the complexity of the survey, there are some important omissions in the questionnaire administered to merchants. Most notably, (a) it is unclear how multinational merchants has been treated (e.g., what if a merchant has stores in two countries?), and (b) some important cost items were omitted (e.g., insurance for till shortages and other losses, special security equipment).

d) Out of 500 total questionnaires that the EC was planning to collect, Deloitte Consulting managed to return only 465. Yet, the analysis was produced using only 253 responses. This sample size implies that a lot of potentially useful information has been disregarded, deemed by the EC to be of not sufficient quality.

With respect to the methodology we make the following observations:
a) The EC decided to implement the MIT based on marginal costs only. This assumption implies that costs that do not vary when an additional single transaction is performed are excluded from the analysis.\(^4\) This decision has vast consequences and has not been properly justified. We can see two problems with this way of proceeding. First, if one believes that MIFs should send the proper signal to consumers about the efficient choice among payment instruments with different costs, then a long-run perspective must be adopted and fixed costs should be included. Second, some of the costs are set by third parties and cannot be treated as exogenous (e.g., whether cash deposit costs at the bank are charged as a percentage of the deposit or as an annual fee will impact the calculation). This approach makes the methodology non-robust and jeopardizes the relevance of final results.

b) Besides the exclusion of fixed costs, the EC has made a number of arbitrary decisions on how to implement the test. First, by modelling a linear cost function, the EC estimated costs in a way that excludes economies of scale for a number of cost items. Second, the EC used a specific, and not clearly justified, approach to defining the average merchant. Third, the EC developed the test using the average value of a random card transaction as a reference, rather than considering alternative possibilities, such as using the average value of a random transaction with cash.

On the EC’s results, we raise the following points:

a) The results appear to be very different from the results of analysis we recently conducted for Italy, where we estimated MIT-compliant MIFs of 2.01% and 1.94% for debit and credit cards, respectively, using a representative sample of 300 Italian merchants.\(^5\) Even when we restrict our results to a sample of large merchants in Italy, we obtain a MIF of 1.29% after combining debit and credit cards. Assuming that the quality of responses is comparable across both merchant surveys, these large discrepancies suggest that the specific methodological approach chosen by the EC has substantial impact on the results. In particular, the exclusion of fixed costs and the focus on large merchants seem to be responsible for the very low MIT-compliant MIFs estimated by the EC.

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\(^4\) The EC has also performed the analysis under a second scenario, where it considers costs that are expected to change when a substantial number of transactions shift from cash to card. It is our understanding that this scenario still excludes from the analysis a large number of cost items that are considered fixed, but the MIFs obtained are slightly larger than those obtained in the first scenario.

b) The EC has not provided detailed evidence on individual cost items, but it has provided an estimate for acquiring cost (inclusive of margin), which is a central element in performing the MIT. The EC has estimated acquiring costs to be equal to 0.06% of transaction value, by calculating the difference between the average merchant service charge from the survey and the average prevailing MIFs. This level is implausibly low, bearing in mind that it should cover all acquiring costs (scheme fees, operations, profit margin). Using a higher and more plausible acquiring cost would deliver even lower MIT-compliant MIFs.

In conclusion, after considering all the available evidence (including our study for Italy), as well as noting that the EC’s work focused on a non-representative sample of very large merchants and that the analysis contains some unjustified assumptions that tend to reduce the cost of cash, we can conclude that the data produced by the EC may support substantially larger values for MIT-compliant MIFs in Europe, possibly well above the 0.2%/0.3% caps. In fact, our data for Italy suggest MIT compliant MIFs well above 1% of the transaction value.

If the final work of the EC will be based on the same premises, we are doubtful that it will be adequate to justify intervention in the payment card market. In particular, we believe that further empirical work is needed to refine the estimation of the cost of cash and card and to provide evidence that the regulation will produce benefits rather than costs. We observe, tangentially, that much more thought and research has been put by the EC before coming out with similarly important regulations in other markets (e.g. see the Commission Recommendation of the regulatory treatment of fixed and mobile termination rates of 2009).

The rest of this document discusses the EC analysis in more detail, as can be determined from their February 2014 presentation, and justifies the conclusions outlined above. Our comments are italicized in the text to distinguish them from more factual observations about the analysis carried out by the EC.
I. SURVEY AND DATA COLLECTION

The Commission launched the survey on “Merchants’ Costs of Processing Cash and Card Payments” at the end of 2008. The first contract was awarded in 2008 to EIM Consulting but the results of the data collections were never made public. Subsequently a new contract was awarded to Deloitte Consulting in 2012. The entire process of data analysis is yet to be completed and has taken more than 5 years so far. The timeline in Figure 1 shows the main milestones of this process.

Figure 1: Timeline of the European Commission’s Methodology and Data Collection

Source: our elaboration

The EC set up two different data collection phases: i) the collection of precise and detailed cost data for 500 large merchants in 10 member countries, and ii) the collection of data on value and volume of payments for a larger group of retailers of all sizes in the same 10 countries.

Deloitte Consulting handled the recruitment of large merchants, initially contacting 14 European retailer associations and 155 local retailer associations. Only a limited number of associations responded to Deloitte’s request and reached out to their members. Deloitte Consulting also used its own network of clients to identify potential respondents.

Large merchants have been defined by the EC as having an annual turnover greater than or equal to 50 million euro per year. The EC also left the door open for recruiting merchants with turnover larger than 20 million euro per year, if meeting the threshold above turned out to be problematic. In fact, the chart on page 8 of the February 2014 EC presentation (henceforth simply “EC presentation”) shows that merchants in the survey sample have minimum revenues of 20 million euro and maximum revenues of 100 billion euro per year.

In total, 2,300 merchants were contacted on an individual basis; only 465 were engaged and participated in the survey, and of those, only 253 managed to provide all the required data at sufficient quality to be included in the study. The criteria used to exclude observations with incomplete answers are not known.

During the presentation of the preliminary results of the study, Deloitte Consulting reported that many merchants refused to participate in the survey because of the objective difficulties
in collecting and organizing the data. In particular, Deloitte Consulting reported that merchants were: i) sceptical about the purpose of the analysis, ii) involved in similar initiatives within their home countries, and/or iii) unable to dedicate the right amount of resources and effort to complete the survey.

Furthermore, Deloitte Consulting explicitly declared during the presentation that merchants were informed of the purpose of the survey, which appears to be in stark contrast with best practice, given that merchants – especially large ones – had a direct interest in the outcome of the survey.

The survey was administered online though a dedicated website. Deloitte Consulting intervened directly in the data collection process only to measure time for front office operations.

Large merchants of the kind included in the survey are usually multinational and multi-brand firms, operating with a chain of retail stores in more than one country (both within and outside of Europe). To our knowledge, the questionnaire used by the Commission did not allow the merchant to clarify whether data were being reported at the national or international level.

The EC decided to use only 254 interviews out of the 465 responses collected to conduct its analysis, excluding merchants that did not satisfactorily complete the survey. It is not clear why the EC decided to ignore half of the questionnaires, even though these were incomplete. For instance, standard data imputation techniques could have been used to avoid the loss of valuable information.

The sample of merchants interviewed by Deloitte Consulting and considered for the analysis is made up of 254 merchants. The countries covered by the survey are (with the respective number of interviews noted in parentheses): Sweden (50), France (33), UK (28), Belgium (27), Germany (24), Poland (24), Italy (18), Spain (18), Netherlands (16), and Austria (15). The target number of interviews for each country was 50; however, for most countries, Deloitte Consulting did not collect input from more than 30 merchants. As previously mentioned, the survey also exclusively targeted large merchants.

12 total activity sectors were covered by the sample, as reported in the following list (again noting the respective number of (merchant) observations in parenthesis for each): Clothing (52), Supermarkets and Department Stores (37), Household Electronics and Furniture (37), Other Specialized Stores (31), Hotels (22), Footwear (20), Restaurants (14), Sporting Equipment and Books (13), Petrol Stations (10), Specialized Food and Beverage Stores (8), Computer and Other Telecom Equipment (5), Car Repair and Maintenance (4). The Commission did not provide information about sector breakdown of the total turnover of merchants in the sample.

Merchants included in the analysis have total revenues equal to 414 billion euro; card transactions represent about 60% of this amount. Hence, the sample covers about 12% of the total value of card transactions in Europe and about 13% of total retail trade in Europe.
In the public call for tender, the EC did not define any particular requirement for sample segmentation and stratification. While it is true that the EC results are only preliminary, we believe that it would have been reasonable to maintain representativeness of the targeted population in the study’s sample, at least to some extent.

There are three manners in which the sample is not representative of the target population of large merchants in the 10 countries under analysis.

First, each of the countries considered in the study has a different share of total revenues generated by large merchants in Europe. However, the sample was not stratified to reflect this fact, despite the fact that a copious amount of empirical evidence shows that payment costs vary substantially across different countries. Table 2, below, illustrates this fact.

Table 2: Turnover Distribution of Large Merchants in Europe

<table>
<thead>
<tr>
<th>Country</th>
<th>Total Turnover of Large Merchants in Retail Trade (Bln, €)</th>
<th>Country Weight in Terms of Turnover</th>
<th>N. of Observations Required According to Population Weights of Target Number of Large Merchants in the Sample</th>
<th>N. of Observations Required According to Population Weights of Sample</th>
<th>N. of Large Merchants in the Sample</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Austria</td>
<td>29.7</td>
<td>2%</td>
<td>12</td>
<td>38</td>
<td>6</td>
<td>9</td>
</tr>
<tr>
<td>Belgium</td>
<td>40.3</td>
<td>3%</td>
<td>17</td>
<td>33</td>
<td>9</td>
<td>27</td>
</tr>
<tr>
<td>France</td>
<td>229.5</td>
<td>19%</td>
<td>96</td>
<td>46</td>
<td>48</td>
<td>33</td>
</tr>
<tr>
<td>Germany</td>
<td>237.0</td>
<td>20%</td>
<td>99</td>
<td>49</td>
<td>50</td>
<td>24</td>
</tr>
<tr>
<td>Italy</td>
<td>115.0</td>
<td>10%</td>
<td>48</td>
<td>2</td>
<td>24</td>
<td>18</td>
</tr>
<tr>
<td>Netherlands</td>
<td>44.1</td>
<td>4%</td>
<td>18</td>
<td>32</td>
<td>9</td>
<td>16</td>
</tr>
<tr>
<td>Poland</td>
<td>37.2</td>
<td>3%</td>
<td>16</td>
<td>34</td>
<td>8</td>
<td>24</td>
</tr>
<tr>
<td>Spain</td>
<td>105.8</td>
<td>9%</td>
<td>44</td>
<td>6</td>
<td>22</td>
<td>18</td>
</tr>
<tr>
<td>Sweden</td>
<td>31.4</td>
<td>3%</td>
<td>13</td>
<td>37</td>
<td>7</td>
<td>50</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>327.5</td>
<td>27%</td>
<td>137</td>
<td>87</td>
<td>69</td>
<td>28</td>
</tr>
<tr>
<td>Total</td>
<td>1,198</td>
<td>100%</td>
<td>500</td>
<td>500</td>
<td>253</td>
<td>253</td>
</tr>
</tbody>
</table>

Notes:

[A]: Eurostat, Structural Business Statistics Database. - Retail Sectors selected: G.45.2, G.47.1, G.47.2, G.47.3, G.47.4, G.47.5, G.47.6, G.47.7, I.55, I.56. Merchants with > 20 Million euro of Turnover
[B]: Total Turnover of Large Merchants in each countries / Total Retail Turnover of Large Merchants in the 10 European countries
[D]: Specifications to invitation to tender COMP/2012/003, p.2
[G]: European Commission, Survey on Merchants' Costs of Processing Cash and Card Payments, Preliminary Results. Presentation 19 February 2014, Slide 7

Table 2 shows the distribution of revenues for all large merchants in the selected European countries, the relative weight of each country in terms of total revenues, and the number of observations for both the targeted and actual samples that the EC should have collected to properly stratify the sample, taking into account countries’ relative weights (see column [C] and column [F] of the table). The table also shows the differences between the numbers of per-country individual observations in the ideally-stratified sample and the number of per-country observations actually collected by the EC. It is evident that some countries are overrepresented (e.g., Sweden), while other countries are underrepresented (e.g., Germany).

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6 See, for example, Schmiedel H., Kostova G., Ruttenberg W. (2012).
Because, to our knowledge, the EC has not adjusted observation weights to stratify the sample after data collection, and because of the aforementioned heterogeneity of payment costs across countries, we can see that conclusions obtained from simple averages in the sample are bound to have little validity for the entire population of large merchants in Europe.

Second, the EC did not stratify the sample across sectors of merchant activity, nor, to our knowledge, performed any ex-post adjustment. This is illustrated in the following table.

Table 3: Population of Large Merchants in Europe across Sectors

<table>
<thead>
<tr>
<th>Sectors</th>
<th>Total Number of Large Merchants in the Countries [A]</th>
<th>Sector Weight in Terms of Number of Large Merchants in the Countries [B]</th>
<th>N. of Observations According to Population Weights [C]</th>
<th>Number of Large Merchants in the Sample [D]</th>
<th>Difference [E]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Car Repair and Maintenance</td>
<td>239</td>
<td>3%</td>
<td>8</td>
<td>4</td>
<td>-4</td>
</tr>
<tr>
<td>Clothing, Footwear and Other Specialised Stores</td>
<td>1,568</td>
<td>20%</td>
<td>51</td>
<td>103</td>
<td>-52</td>
</tr>
<tr>
<td>Computer and Other Telecom Equipment</td>
<td>414</td>
<td>5%</td>
<td>14</td>
<td>15</td>
<td>-9</td>
</tr>
<tr>
<td>Hotels</td>
<td>483</td>
<td>6%</td>
<td>16</td>
<td>22</td>
<td>6</td>
</tr>
<tr>
<td>Household Electronics Fornitures</td>
<td>735</td>
<td>9%</td>
<td>24</td>
<td>37</td>
<td>13</td>
</tr>
<tr>
<td>Petrol Stations</td>
<td>337</td>
<td>4%</td>
<td>11</td>
<td>10</td>
<td>-1</td>
</tr>
<tr>
<td>Restaurants</td>
<td>901</td>
<td>12%</td>
<td>29</td>
<td>14</td>
<td>-15</td>
</tr>
<tr>
<td>Specialized Food and Beverage Stores</td>
<td>175</td>
<td>2%</td>
<td>6</td>
<td>8</td>
<td>2</td>
</tr>
<tr>
<td>Sporting Equipment and books</td>
<td>262</td>
<td>3%</td>
<td>9</td>
<td>13</td>
<td>4</td>
</tr>
<tr>
<td>Supermarkets &amp; Department Stores</td>
<td>2,633</td>
<td>34%</td>
<td>86</td>
<td>37</td>
<td>-49</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>7,747</strong></td>
<td><strong>100%</strong></td>
<td><strong>253</strong></td>
<td><strong>253</strong></td>
<td></td>
</tr>
</tbody>
</table>

Notes:
[A]: Eurostat, Structural Business Statistics Database, Merchants with Turnover > 20 million of Euro
[B]: European Commission, Survey on Merchants’ Costs of Processing Cash and Card Payments, Preliminary Results. Presentation 19 February 2014, Slide 8

Table 3 shows the distribution of large merchants in the ten selected European countries among the sectors, the relative weight of each sector in terms of the number of observations, and the number of observations for each sector that would result from an ideally-stratified sample. As before, we calculated the differences between the number of observations collected for each sector and the number of observations that should have been collected if a stratified sample was utilized.

Because available empirical evidence suggests that there are important differences in payment costs for merchants across various sectors (e.g., hotels have higher cost of cash and lower cost of cards compared to restaurants, which have higher costs of cards and relatively low cost of cash), the EC figures obtained by taking a simple average across sectors within the sample cannot be considered an unbiased estimate of population values (i.e., values from the population of large merchants in Europe).7

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7 In our study on the cost of cash and cards, based on a sample of about 300 Italian merchants, we detected significant differences for the costs of payment instruments among different sectors. More details in Bazzucchi L., Condorelli D., Lo Passo F. (2013).
Third, even if we assumed that the sample was randomly distributed across countries and sectors, the sample used by the Commission does not match the distribution of merchant turnover in Europe for those with turnover above 20 million euro per year. For instance, the average turnover of large merchants included in the sample is 1.6 billion euro per year.\(^8\) However, according to our calculations, the average turnover of large merchants in the retail sector for the 10 selected countries is approximately 364 million euro per year, slightly less than 1/3 of the average of the sample.\(^9\) Again, given that it is well known that economies of scale are present for payment costs, and as a result merchants of different sizes may have very different cost functions, this fact makes it difficult to consider the EC’s results applicable to the population of large merchants.

The questionnaires completed by merchants had more than 100 data points. Deloitte Consulting reported that some merchants who participated and completed the survey have declared that the task was extremely time-consuming, taking more than 3 weeks of work in certain cases. The cost items collected though the survey were split into 5 categories: i) Information about the Merchant, ii) Merchant Labor Costs, iii) Merchant Service Charge and Devices Information, iv) Other Information on the Merchant, v) Nature of Costs. The table below shows all the relevant cost categories included in the survey and the details about the items included.

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\(^8\) Given by 414 billion of euro of total retail turnover within the sample divided by 253 large merchants that have been interviewed.

\(^9\) We computed total retail turnover of the retail sector for the group of countries selected by the Commission by dividing 414 billion euro, equal to the total retail turnover of the sample, by the coverage ratio of 14.7% in the 10 countries. We then divided the total revenues—estimated to be about 2,816 billion euro—by the total number of large firms in the retail sector (7,747), obtaining an average turnover of 364 million euro.
Table 4: Cost Categories Included in the Survey

<table>
<thead>
<tr>
<th>Relevant Costs</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Payment processing at the till</td>
<td>Measures of time to process</td>
</tr>
<tr>
<td>Back-office labor</td>
<td>Annual hours per task (such as counting cash, transporting cash from and to the back office, storing and filling card signature slips, etc.), hourly wage</td>
</tr>
<tr>
<td>Outsourced back-office activities</td>
<td>Cash transport and deposit at the bank branch, costs of changing money, other</td>
</tr>
<tr>
<td>Merchant Service Charge (MSC) per card type</td>
<td>Total amount and structure of the MSC, the MIF, schemes fees and other acquirer fees</td>
</tr>
<tr>
<td>Payment processing equipment</td>
<td>Cash registers, counterfeit note checkers, money boxes, cash transport tubes, point of sale (POS), etc.</td>
</tr>
<tr>
<td>PCI-DSS</td>
<td>Capital investment, labor costs, license cost</td>
</tr>
<tr>
<td>Fraud and losses</td>
<td></td>
</tr>
<tr>
<td>Surcharges and rebates</td>
<td></td>
</tr>
<tr>
<td>Float</td>
<td>Forgone interest on bank balances</td>
</tr>
</tbody>
</table>

The payment instruments for which the questionnaire requested detailed information are: i) cash, ii) domestic debit cards, iii) international four-party debit cards (Visa Electron, V-Pay, and Maestro), and iv) international four-party credit cards (MasterCard and Visa) and any other credit cards (American Express, Diner’s, store cards and any other). Moreover, the study surveyed the total number of transactions and amounts for: i) PayPal accounts, ii) credit transfer, iii) direct debit, iv) cash on delivery, v) cheques, vi) vouchers/points redeemed/coupons, and vii) all other payments types.

The transactions considered for the analysis were exclusively face-to-face transactions; however, the survey required merchants to report at the beginning of the survey the number and value of transactions completed remotely (via the Internet, pre-ordered, etc.).

The Commission included in the questionnaire most of the relevant items that affect the costs of cash and cards in retail stores. However, despite the large number of questions, there are some details that are apparently missing and which would have improved the quality of the information collected. For example, the Commission: i) did not seem to have introduced check-boxes to counter-check the consistency of answers, ii) provided two alternative methods for estimating the total number of time spent in back office activity, but in one of the two methods, it failed to ask about the categories of staff dedicated to the task, iii) did not ask for the costs of insurance against till shortages, thefts and frauds, and iv) did not include any security costs related to closed-circuit television or other security instruments.

The fact the EC has explicitly decided to collect data only on in-person transactions is a sign that the EC recognizes, as we have also argued elsewhere (see Condorelli 2013b), that the
*merchant indifference test is not the correct benchmark to evaluate interchange fees for card-not-present transactions.*

**II. METHODOLOGY**

The data collection has been primarily driven by the Commission’s objective of determining the level of multilateral interchange fees (MIFs) that would be acceptable from a standpoint of competition law. As made clear in several occasions, the EC considers the Merchant Indifference Test (MIT) the relevant benchmark on which to evaluate competition law compliant MIFs. The idea underlying the test dates back to Baxter (1983) and has been explicitly formulated, more recently, in Rochet and Tirole (2011). Roughly speaking, the current average MIF passes the MIT if the average merchant is no worse off from accepting a card payment in-store from a non-repeat customer rather than a cash payment.

As we have argued elsewhere, the MIT has been developed in the context of a stylized theoretical model. No study whatsoever has been produced that should make us confident that a payment-market regulation based on the MIT is more likely to result in a welfare gain rather than a welfare loss. Nevertheless, even if the results of the theoretical model are to be taken at face value, the MIT may still not be the correct benchmark when some of the assumptions of the model are violated (as it is the case in practice) or if overall social welfare is taken into account, rather than only the sum of the welfares of card users and merchants. For more on this topic, see our previous work in Condorelli (2013a).

The theoretical literature provides guidance on understanding the role played by MIFs in a two-sided market and on what determines optimality of MIFs under different welfare criteria. However, it does not explain (and, indeed, was not intended to show) how the test should be implemented in practice, and what to do when some of the theoretical assumptions are empirically violated. Moreover, no authoritative account has been ever produced on what is the best way to implement the MIT in practice (see Rysman and Wright (2012) on this). Hence, the EC (like anyone else who has attempted to empirically implement the test) has been forced to make a number of arbitrary implementation decisions to perform the MIT. We will review all these decisions as we proceed.

Based on the EC presentation, it appears that their intention is to determine the MIT-complaint MIF based primarily on the difference between the incremental cost of a single average transaction processed with cash and the incremental cost of a transaction of the same value processed with card (net of the prevailing interchange payment).

Because finalizing a payment involves a complex set of operations (including handling the transaction at the till, performing back office activities, dealing with losses and security issues, etc.) the determination of the incremental cost of a single transaction is complex and depends crucially on considering both variable and fixed costs. From the EC’s presentation, it appears that the Commission has developed its analysis under two different scenarios. In Scenario 1, the (classically-defined) marginal cost of a single extra transaction is taken into account; in Scenario 2, all costs were considered that would change given a persistent and substantial shift in the volume of transactions processed with the payment method.
The exclusion of fixed costs from the analysis (i.e., costs that would change under a large shift in payment usage patterns) has not been motivated and appears unjustified. In fact, the theoretical literature upon which the test is based does not imply that marginal cost is the correct standard. Perhaps, since the objective of the MIT-compliant fee is to have consumers internalize the externality imposed on merchants with their payment, a long-term approach should be adopted. In that case, all costs—both variable and fixed—should be included when estimating the avoided costs of paying with card rather than with cash. For this reason, and because the EC has the data, we would have expected the EC to also present results for the scenario in which all costs are considered variable.

In an attempt to estimate the marginal cost of a single transaction of arbitrary value, the EC postulated that each merchant $i$ (where $i$ indicates the specific merchant among the 254 included in the dataset) incurs, for any given payment instrument $k$ (either cash, credit card or debit card), a total annual payment-handling cost, denoted $TC_{i,k}$, which depends linearly on the number of transactions handled, denoted $N_{i,k}$, and on the total value of sales with that instrument, denoted $V_{i,k}$. That is:

$$TC_{i,k}(N_{i,k},V_{i,k})= F_{i,k} + a_{i,k} N_{i,k} + b_{i,k} V_{i,k}$$

where $F_{i,k}$ is a constant specific to the merchant and payment instrument, and $a_{i,k}$ and $b_{i,k}$ are merchant/payment-specific coefficients. In other words, we can interpret $F_{i,k}$ to be the portion of the total annual payment cost sustained by merchant $i$ even if no transactions took place with the specific payment instrument $k$ (i.e., $F_{i,k}$ is a fixed cost for using payment instrument $k$). The remainder of the total cost is comprised of variable costs, where the first coefficient represents the incremental cost incurred when an extra transaction is handled by the merchant (assuming that the total yearly value of transactions remains unchanged) and the second coefficient is the incremental cost for an additional euro of sales handled (when keeping constant the number of transactions performed over the year).

While we recognize that identification of marginal costs requires imposing a sufficient number of assumptions on the cost function, forcing the cost function to be linear is questionable for at least two reasons. First, it neglects to consider the existence of economies of scale for those cost items that vary by number of transactions or value. It is a rather obvious point, also justified by existing empirical studies (e.g., Schmiedel et al. (2012)), that economies of scale play an important role in determining payment costs of a merchant. Second, the function excludes any potential interaction among the number and value of transactions (i.e., it is assumed that the number of transactions performed does not affect the additional cost generated by an extra euro of transaction). While this assumption might be reasonable for many cost items, it is certainly not always valid. For instance, the assumption would be violated if handling a large number of low-value transactions had lower front-office costs (perhaps because of the use of contact-less payments) than a small number of high-value transactions (which may require PIN and chip payments for added security).

Setting aside the assumption of linearity, the additive structure of the function implies that the identification of the marginal cost of a given transaction requires segmenting all costs into three mutually-exhaustive categories: (A) costs that are assumed to vary only when the
number of transactions varies, (B) costs that are assumed to vary only when the transacted value varies, and (C) costs that are invariant to both these measures.

Therefore, in order to fit the cost function above, the EC requested that merchants indicate the nature of each cost item.10 As we have previously mentioned, since the classification of costs is crucial in determining the final results of the analysis, the EC decided to analyze two different scenarios. In Scenario 1, merchants were asked to identify the costs that would vary when an additional transaction or an extra euro of sale occurred, as opposed to costs that would remain invariant to a marginal change in either of those variables. In Scenario 2, merchants were asked to identify which costs would change if there was a 10% shift in the number (or value) of transactions, persistent over a longer time horizon of 3 to 4 years.

For both scenarios, but predominantly for the first one, the EC provided the merchants with a number of pre-set answers that reflected its prior view on the variability of such costs. Because fixed costs are excluded from the analysis, and because cash and card payments have a very different cost structure, the categorization of costs becomes extremely important to the results of the analysis. Yet, especially for Scenario 1, the EC has forced a number of answers onto the merchants.11 While we agree with most of the EC’s choices, the current design mixes the EC’s prior views with first-hand merchant data in a troubling way.

In Scenario 2, merchants were free to indicate the nature of their costs. However, they were left with a much more difficult burden than for Scenario 1. In fact, any attempt to force all costs into the three mutually-exclusive categories, following a 10% long-term change in cash or card usage, strikes us as arbitrary. For instance, consider the transportation of cash to the bank and between stores. Whether a 10% reduction in cash payments affects this cost, and to what extent, depends on a large number of factors. For example, the cost of cash transportation might not change at all if it represents a 10% decrease in cash usage at each of 100 stores of a retailer, while the cost would vary significantly if the change in volume represented the closure of 10 stores out of 100. Currently, we do not have much information about how the classification of costs affects the final result, but we expect this to be a crucial issue when the final report will come out.

Finally, there is an additional problem with having to categorize costs in various categories. Because some of the costs of handling payments are external (e.g., cash transport may be outsourced to third parties), the nature of the cost is directly affected by how the external party prices its services. For instance, consider the point of sale (POS) terminal cost. We expect this cost to be excluded from a marginal cost analysis because POS terminals are

10 We have not been able to verify this information, but we expect that the classification of costs was not uniform across merchants.

11 For the sake of precision, we must say that merchants were allowed to overrule EC’s determination, but we expect that this happened very rarely, especially in light of the fact that completing the questionnaire was costly for merchants in terms of time and resources.
usually rented out on a monthly basis. However, what if acquirers were to explicitly price the POS terminal in the merchant service charge and make the price vary with the number of transactions? In this case, the POS terminal cost would have to be included in the marginal cost analysis. Conversely, what if the merchant service charge were to be altogether suppressed and all acquiring costs were recovered through the POS terminal rental fee? With these scenarios under consideration, it is clear that basing the analysis on marginal cost is not robust, since pricing from third parties may change depending on market conditions.

By classifying costs into the above three categories (and using the hypothesis of linearity), it becomes straightforward to derive from survey data, for each merchant \( i \) and payment instrument \( k \), the constant \( F_{i,k} \) and the coefficients \( a_{i,k} \) and \( b_{i,k} \). More precisely, while the fixed cost component is directly obtained from the survey, the coefficients are obtained by dividing the total cost in a certain category by the relevant variable, after summing up cost items that are considered invariant (e.g., \( a_{i,k} \) is obtained by dividing the fraction of total annual costs that vary by the number of transactions by the total reported number of annual transactions). Note that, in the case of cards, the merchant service charge that was actually paid by the merchants was excluded from the computation of costs, in compliance with the MIT methodology.\(^{12}\)

Having computed the relevant coefficients from survey data, in any given scenario the marginal (incremental) cost for merchant \( i \) of an extra transaction of value \( x \) with instrument \( k \), denoted \( MC_{i,k}(x) \), is estimated by the EC as:

\[
MC_{i,k}(x) = a_{i,k} + b_{i,k} x
\]

Having obtained a merchant’s marginal cost for various payment instruments, the EC can compute the MIT-compliant merchant service charge (i.e., the merchant service charge that makes the merchant indifferent between cash and card) for a transaction of size \( x \) as the difference between the marginal cost of performing the transaction with cash and the marginal cost of performing the transaction with card (net of the prevailing merchant discount). That is, denoting the MIT-compliant merchant service charge for instrument \( k \) (be it debit or credit card) as \( MSC_{i,k}(x) \), we have:

\[
MSC_{i,k}(x) = MC_{i,cash}(x) - MC_{i,k}(x)
\]

Finally, having obtained the average MIT-compliant merchant service charge in both scenarios, calculating the MIT-compliant average MIF for a transaction of size \( x \) at merchant \( i \) only requires subtracting an estimate of the cost of providing the acquiring service (inclusive of any profit margin but net of the prevailing interchange fee).

An estimate of the acquiring cost per euro of sale has been obtained by the EC by subtracting the average interchange fee estimated using public information from the (presumably

\(^{12}\) As discussed later, this is due to the requirement of having to separate the cost of acquiring from the interchange fee that it is currently being paid.
weighted) average merchant discount observed in the sample. As expected, the estimated acquiring cost obtained using this method is the same in both scenarios and is assumed to be the same for all merchants.

*Estimation of the acquiring cost is an aspect of the methodology for which the EC has not provided enough information. For instance, it is not clear how the EC has calculated the MIF that applies to the set of transactions considered in the sample. Interchange fees vary widely by country, merchant typology, and various other aspects of the transaction. Hence, using the average economy-wide MIF as an estimate of the level of the MIF for merchants in the sample would certainly lead to a biased estimate of the cost of acquiring.*

Denoting the MIT-compliant interchange fee with $MIF_i^k(x)$, expressed in absolute value, for a transaction of value $x$ in any given scenario with instrument $k$ (whether credit or debit card), and with $C$ representing the total acquiring cost per euro of sale, we have:

$$MIF_i^k(x) = MSC_i^k(x) - xC$$

The formula above identifies the MIF that makes a particular merchant indifferent between a transaction of value $x$ made with either cash or card. Instead, the MIT requires that the “average” merchant is indifferent between cash and card, but it is not clear from the existing literature just who this average merchant is. The EC has opted to interpret the idea of the average merchant as follows. First, the per-transaction cost for instrument $k$, denoted $a_k$, is calculated as the average per-transaction cost from the sample (this is essentially the total variable cost per transaction divided by the total number of transactions in the sample). Second, the average per-euro cost $b_k$ is obtained as the average cost per euro of sale in the sample (as above, this is the total variable cost divided by the total value of sales made with the instrument in the sample). Then, the average cost with instrument $k$ of a single card transaction of value $x$ is estimated as:

$$MC_k(x) = a_k + b_k x$$

In other words, we can interpret this formula as the extra variable cost per transaction, generated by a randomly selected single transaction in the sample, plus the extra cost that is variable per euro of sale generated by an extra value of $x$ spent at all merchants, in proportion to their contribution to total value of retail sales. Remember that this marginal cost is computed for both scenarios and for all instruments.

*The methodology for aggregation of the costs across merchants appears reasonable but has not been properly justified. While, again, the theoretical literature provides no guidance on how the “average” merchant should be identified, other aggregation methods might have been used. For instance, one could have taken the weighted-average marginal cost for a transaction of value $x$ across all merchants, weighting each merchant by their contribution to the total number or value of transactions. Because these different approaches would have delivered different results, and because it is not clear a priori which is the correct approach, the analysis performed by the EC may not be sufficiently robust for alternative but plausible interpretations of how to empirically identify the “average merchant.”*
With the aggregate marginal cost functions at hand for all payment instruments, performing the MIT only requires defining the value of the transaction over which the average merchant should be indifferent. Again, the theoretical literature provides no guidance in this case, and the EC has opted to use the value of an average card transaction (credit or debit) in the sample. Denoting with $ATV_k$ the average transaction value for instrument $k$ (credit or debit), the MIT-compliant MIF, expressed as a percentage of the transaction value, is computed by the EC for both scenarios as:

$$MIF_k = \frac{MC_{\text{cash}}(ATV_k) - MC_k(ATV_k)}{ATV_k} - C.$$  

It is not clear why the EC has decided to use an average card transaction to obtain the MIT-compliant MIF. There seems to be no inherent reason for why an average card transaction should be used rather than, for example, an average cash transaction. Conducting the test with different transaction values would lead to different results. This is another instance of where the EC analysis lacks robustness.

### III. EC Results on MIT-Compliant MIF

The EC presentation reports preliminary results that the EC obtained by performing the analysis described above on the data collected from the sample of merchants who completed the survey. Recalling that the analysis was conducted for two alternative scenarios, the results are summarized in the following table.

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13 There seems to be a typo in the EC presentation, since the MIF in the formulas is not explicitly normalized using the average transaction value. $C$ again represents the total acquiring cost per euro of sale.
The main results that emerge is that the MIT-compliant MIF for debit and credit cards estimated by the EC for the merchants in the sample is equal to 0.02% and 0.07%, respectively, in Scenario 1, and 0.11% and 0.15% in Scenario 2.

It should be noted that these results are preliminary and no explicit claim of out-of-sample validity has been made by the EC. In fact, as we argued before, the sample of merchants analyzed by the EC is hardly a random sample from the population of all card-accepting merchants in Europe. With the aim of producing a figure (or a set of numbers) that would be applicable to Europe (or individual European countries), the EC intends to complement the analysis using data from a second survey it has commissioned in 2012 on the value and volume of retail payments with cash and card for a representative sample of European merchants. Details on how exactly the Commission intends to merge the two datasets and estimate payment costs for all merchants in the European population are not available.

14 In both scenarios, the coefficients computed for credit card are identical to those computed for debit cards. On the other hand, the coefficients computed for cash differ depending on whether this instrument is compared to credit or debit cards. This is extremely surprising.

15 The numbers reported in the presentation do not add up properly. For instance, using the coefficients reported on page 18 of the EC presentation, we compute MIT-compliant MIFs of 0.04% and 0.08% for debit and credit cards in Scenario 1 and MIFs of 0.11% and 0.13% in Scenario 2. Comparing these numbers with the numbers reported by the EC on page 19 (and contained in Table 1 above), we can see that there slight discrepancies. Most notably, the results of 0.02% differ for both debit cards in Scenario 1 and for credit cards in Scenario 2. In the case of debit cards for Scenario 1, this is a 50% difference. We don’t exclude that these errors are due to cumulated rounding, which is not detailed in the presentation.
Strikingly, in both scenarios there seems to be no difference between the values estimated for debit and credit cards. Hence, the difference in the final MIT-compliant MIF for debit and credit cards is entirely driven by the different average transaction sizes for debit and credit cards.

Looking across scenarios, it is evident that the inclusion of fixed costs in the analysis would tend to increase the cost of cash more than the cost of cards. In fact, while the coefficients for cards are stable across the two scenarios, the variable component of cash increases substantially from Scenario 1 to Scenario 2.

In the EC’s presentation slides there is no mention of variability in the sample or the statistical significance of the estimates, but we expect a discussion to be present in the final paper. For the time being, a quick inspection of EC slides 20 and 21, which present the distribution of merchant specific MIT-compliant MSC for debit and credit cards, suggests a relatively low variability, especially in the case of credit cards.

The MIT-compliant MIFs identified by the EC appear very low when compared to the results that we obtained for Italy (see Bazzucchi, Condorelli, Lo Passo (2013)). In our work, which is based on a survey conducted in Italy, we estimated MIT-compliant MIFs of 2.01% and 1.94% for debit and credit cards, respectively, in the baseline scenario (see page ii). Even if, in an attempt to obtain results that are directly comparable to the results of the EC, we restrict attention to large merchants, we find a substantially higher MIT-compliant MIF of 1.29% for combined credit and debit cards (see page 20). There are two important differences between the EC study and our study on Italy that may drive this large difference in results. First, the EC excludes a large set of costs, deemed as fixed, from the analysis, while our analysis includes all costs that are not common to both card and cash. As we have seen from the results in the two scenarios, the inclusion of fixed costs tends to increase the cost of cash more than the cost of cards. Second, the EC is focusing on a non-representative sample of very large merchants and, as we have observed by considering the difference between small and large merchants in our study for Italy, this focus on large merchants tends to reduce the cost of cash relatively more than the cost of cards.16

The EC estimates the acquiring cost to be around 0.06% of the transaction value. This value is implausibly low given that it should be sufficient to cover all acquiring costs (except the interchange payment and the cost covered by the POS terminal rental or sale which are not covered by the service charge). In our work on Italy (cited above), we estimated acquiring costs that were ten times higher (including the margin) of around 0.6% of the transaction value. While our measure was derived to be conservative (errning on the higher side), the large difference between the two values suggests that the true value is probably somewhere in between. If that is the case, the results of the EC would change dramatically and MIT-compliant interchange fees would become negative. Our view is that the EC might have

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16 It is sufficient to observe the difference between the MIT-compliant MIF in the overall population and the MIF we estimated for large merchants.
underestimated the acquiring cost because acquirers tend to offer lower merchant service charges to large merchants, which are overrepresented in the EC’s sample.

IV. CONCLUSIONS

The EC recently presented its preliminary results on the empirical implementation of the merchant indifferent test (MIT).

In order to implement the test, the EC commissioned two surveys to Deloitte Consulting. One survey focused on large merchants and their costs of handling payments with cash and card. The second survey focused on a representative sample of European merchants but only collected data on the usage of different payment instruments.

The EC presented the preliminary results of its analysis of the merchant indifference test from the sample of large merchants, while leaving for the future the task of extrapolating the results to the whole population of merchants in Europe.

The analysis suffers from a number of drawbacks, both methodological and pertaining to the empirical implementation of the test.

The preliminary analysis results applied to the sample of large merchants show very low MIT-compliant MIFs—below 0.15% of the transaction value. This result should be contrasted with the result of a survey we performed for Italy, covering a representative sample of 300 merchants, which resulted in much higher MIT-compliant MIFs—above 1% of the transaction value for both credit and debit cards.

We believe that two factors drive the difference between the results of our work and the results of the EC. On one hand, the EC is only considering very large retailers, while we consider a representative sample of merchants in Italy. On the other hand, we include all costs in the analysis, while the EC excludes fixed costs, which tends to penalize payment cards relative to cash.

We conclude observing that, in light of our previous work and of the various shortcomings of the EC preliminary analysis, we don’t believe the results published in the February 2014 presentation provide the required support for regulating the payment card market, let alone for using the 0.2%/0.3% thresholds that are currently indicated in the draft regulation.

REFERENCES


