

Software rates vs Price of Function Points: A cost analysis

8th September 2012, 12:00

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leda_{MC}

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- Data Confidentiality
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- Conclusions

Aims

Nowadays, in Software Development Contracts the key elements determining the price are:

- The Rate.
- The Effort.

The possibility to measure the quantity of software produced (the size in Function Points) allows us to assess whether there is a logical connection between:

- The price of the projects.
- The software actually produced.

The main goal of this presentation is to:

- Determine if there is a logic relation between rates and the price of the Function Point.
- Draw conclusions on the economic management of software development.

Background

Over the last five years, LEDAmc has managed the productivity of more than 10.000 development projects of significant clients in Spain (primarily telecommunication and financial companies).

They were mainly small enhancement projects.

The main goal of the measures is to control big contracts of Adaptive Maintenances, which implies the highest percentage of our clients development budget.

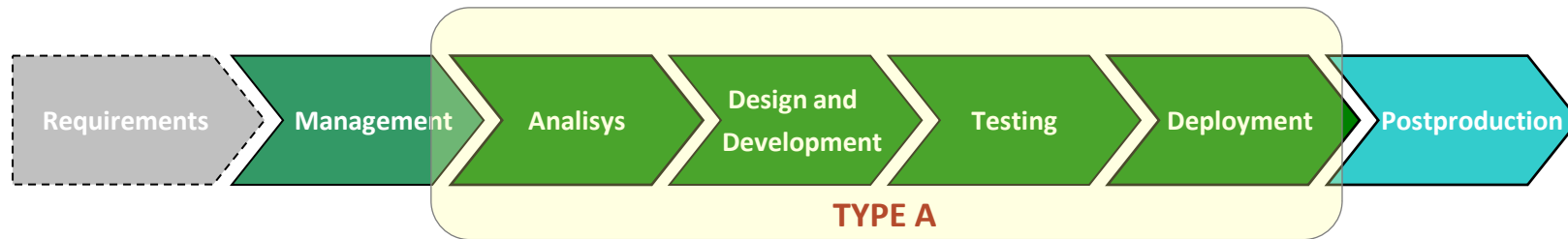
Out of these 10.000 projects we have selected 3.405 in order to analyze the relation between the Rates and the price of the Function Point.

These 3.405 projects were carried out by 14 different providers. The most significant are multinational providers working in other countries with the same or similar clients.

Background

The 3.405 projects were selected by periods and homogenized considering:

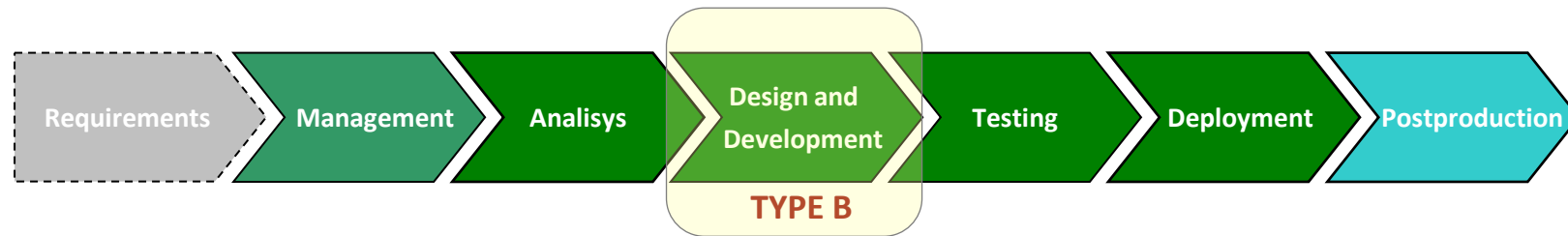
- That the data sets of every provider of each client were statistically consistent.
- That the measured effort was equivalent within all the projects.



Background

The 3.405 projects were selected by periods and homogenized considering:

- That the data sets of every provider of each client were statistically consistent.
- That the measured effort was equivalent within all the projects.



- That the prices were applied to the same concepts.
- That the method used to measure the projects was the same (IFPUG versus NESMA).
- The measurement have been executed or audited by CFPS

Background

So that

EFFORTS, PRICES AND FUNCTION POINTS

were equivalent for all the 3.405 projects.

The basic magnitudes of the sample are:

- 3405 Projects
- 196.356 UFP
- 2.168.192 Hours
- 69.926.907 Million Euros

Most of the measures belong to Adaptive Maintenances of small size (about 60 FP on average).

Data Confidentiality

The main problem of carrying out this study is the confidentiality that LEDAmc is obliged to keep to its clients.

It is obvious that we cannot tell that the productivity of the provider **X** in our client **Y** is **Z**.

And not to mention that the rate of the provider **XX** in our client **YY** is **ZZ**.

In order to solve this problem, the following precautions have been taken:

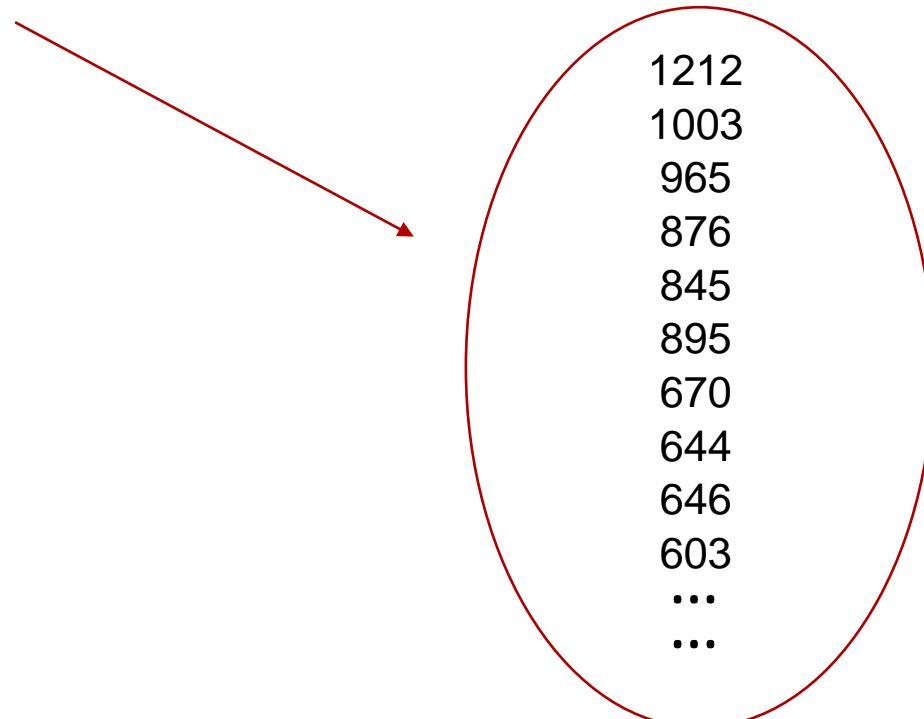
1. The clients are anonymous and they vary from **CL-A** to **CL-J**.
2. The providers are also anonymous and they vary from **P1** to **P14**.
3. The data used is:
 - **Productivity** (FP per manday).
 - **Price of the Function Point**.
 - **Rate**.

It was converted into base 100, as the following slides explain.

Data Confidentiality

The list of prices of the Function Point (from the highest to the lowest) for every provider in each client is something like (this is an example, not the real list):

1212
1003
965
876
845
895
670
644
646
603
619
601
528
531
521
492
490
488
494
477
478
515
475
395
331
279
279
277
320
202
200



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Conversion to a chart
with base 100



1212 100
1003 83
965 80
876 72
845 70
895 74
670 55
644 53
646 53
603 50
619 51
601 50
528 44
531 44
521 43
... ...
... ...

Data Confidentiality

The list of prices of the Function Point (from the highest to the lowest) for every provider in each client is something like (this is an example, not the real list):

| | | | |
|------|--|------|-----|
| 1212 | | 1212 | 100 |
| 1003 | | 1003 | 83 |
| 965 | | 965 | 80 |
| 876 | | 876 | 72 |
| 845 | | 845 | 70 |
| 895 | | 895 | 74 |
| 670 | | 670 | 55 |
| 644 | | 644 | 53 |
| 646 | | 646 | 53 |
| 603 | | 603 | 50 |
| 619 | | 619 | 51 |
| 601 | | 601 | 50 |
| 528 | | 528 | 44 |
| 531 | | 531 | 44 |
| 521 | | 521 | 43 |
| 492 | | ... | ... |
| 490 | | | |
| 488 | | | |
| 494 | | | |
| 477 | | | |
| 478 | | | |
| 515 | | | |
| 475 | | | |
| 395 | | | |
| 331 | | | |
| 279 | | | |
| 279 | | | |
| 277 | | | |

Conversion to a chart
with base 100



Proceeding this way with the real data we obtain the starting matrix for the study:

| Client | Provider | Productivity | F P Price | Rate |
|--------|----------|--------------|-----------|------------|
| CL-A | P1 | 12,2 | 100,0 | 65,1 |
| CL-B | P1 | 18,5 | 64,9 | 64,0 |
| CL-C | P11 | 12,7 | 60,4 | 40,7 |
| CL-D | P2 | 81,0 | 13,2 | 56,7 |
| CL-D | P3 | 60,1 | 18,8 | 60,1 |
| CL-D | P4 | 38,6 | 30,0 | 61,5 |
| CL-D | P5 | 45,9 | 25,3 | 61,8 |
| CL-D | P7 | 50,8 | 21,8 | 58,8 |
| CL-D | P8 | 56,6 | 19,3 | 58,0 |
| CL-E | P12 | 35,5 | 33,8 | 63,7 |
| CL-E | P13 | 30,4 | 45,1 | 72,9 |
| CL-E | P3 | 35,5 | 33,7 | 63,5 |
| CL-E | P4 | 26,2 | 40,2 | 55,9 |
| CL-E | P5 | 34,4 | 37,2 | 68,0 |
| CL-E | P7 | 19,8 | 56,0 | 59,0 |
| CL-E | P8 | 35,1 | 34,5 | 64,2 |
| CL-E | P9 | 32,8 | 36,0 | 62,7 |
| CL-F | P2 | 24,6 | 36,9 | 48,3 |
| CL-F | P5 | 26,4 | 34,6 | 48,5 |
| CL-F | P3 | 26,8 | 34,5 | 49,1 |
| CL-G | P1 | 28,2 | 33,8 | 50,7 |
| CL-G | P3 | 22,0 | 44,3 | 51,8 |
| CL-G | P6 | 25,7 | 34,7 | 47,4 |
| CL-H | P1 | 23,6 | 42,5 | 53,3 |
| CL-H | P2 | 18,2 | 58,2 | 56,3 |
| CL-H | P4 | 21,8 | 46,4 | 53,8 |
| CL-H | P5 | 53,8 | 19,7 | 56,3 |
| CL-H | P6 | 25,2 | 42,3 | 56,7 |
| CL-I | P10 | 100 | 13,8 | 73,3 |
| CL-I | P14 | 96,1 | 19,6 | 100 |
| CL-J | P3 | 14,5 | 68,4 | 52,6 |

The basic element of the matrix
is **CLIENT-PROVIDER**
(and there are 31)

The data:

Productivity

FP PRICE

Rate

| Client | Provider | Productivity | F P Price | Rate |
|--------|----------|--------------|-----------|------------|
| CL-A | P1 | 12,2 | 100,0 | 65,1 |
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| CL-D | P5 | 45,9 | 25,3 | 61,8 |
| CL-D | P7 | 50,8 | 21,8 | 58,8 |
| CL-D | P8 | 56,6 | 19,3 | 58,0 |
| CL-E | P12 | 35,5 | 33,8 | 63,7 |
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Reference data

Weighted mean Productivity:

0,62 FP/Man/day

ISBSG : 0,5

Weighted mean price of the FP:

456 €

Analysis Results

The results that we are going to show are quite obvious for anyone who has managed productivity models with clients.

However, they are not that obvious for the ones who either do not use or do not want to use these type of models.

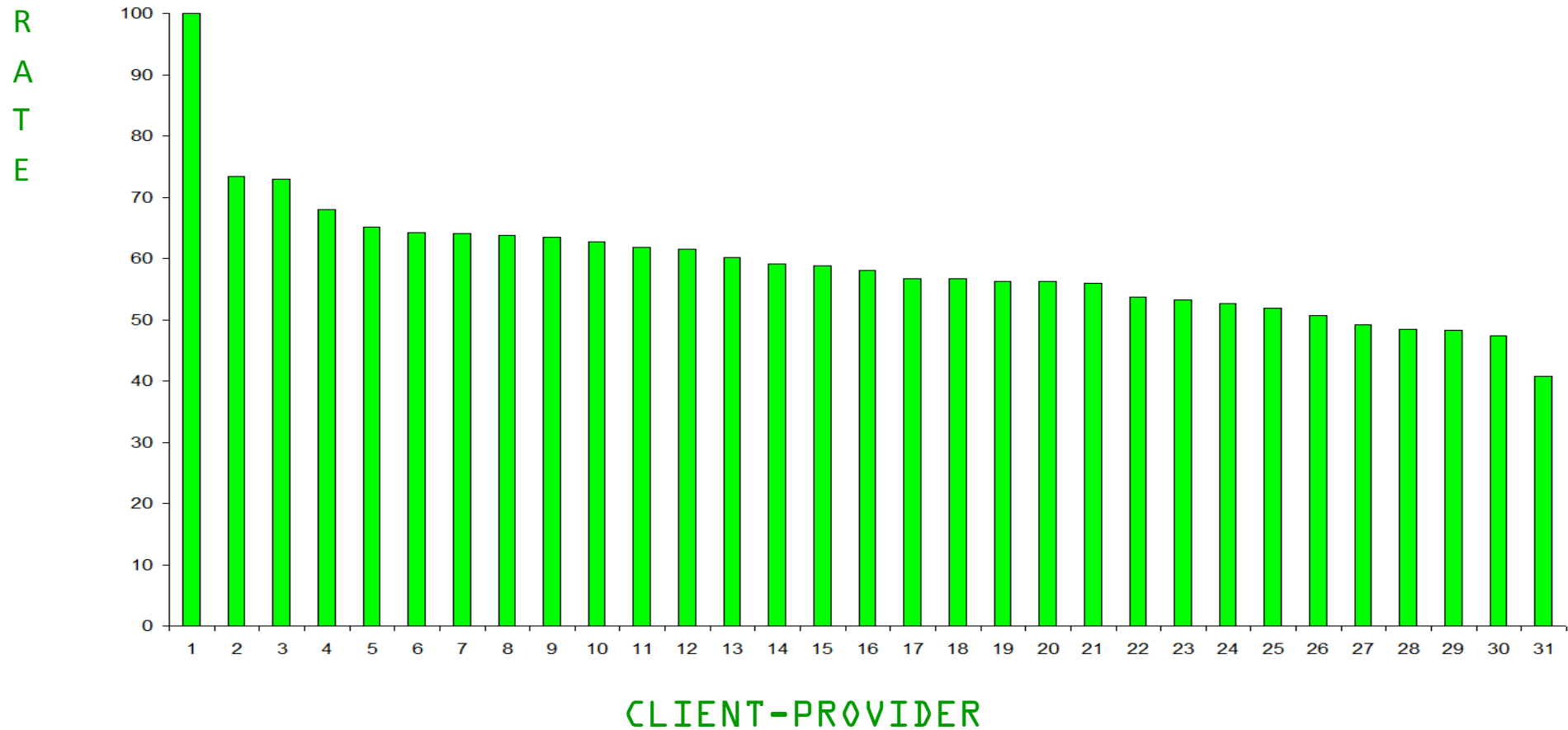
(Or for the ones who do not understand them or do not want to understand them)

The focus of this presentation is:

- To prove the obvious with data.
- Draw conclusions for economic management of the software development.

Results:

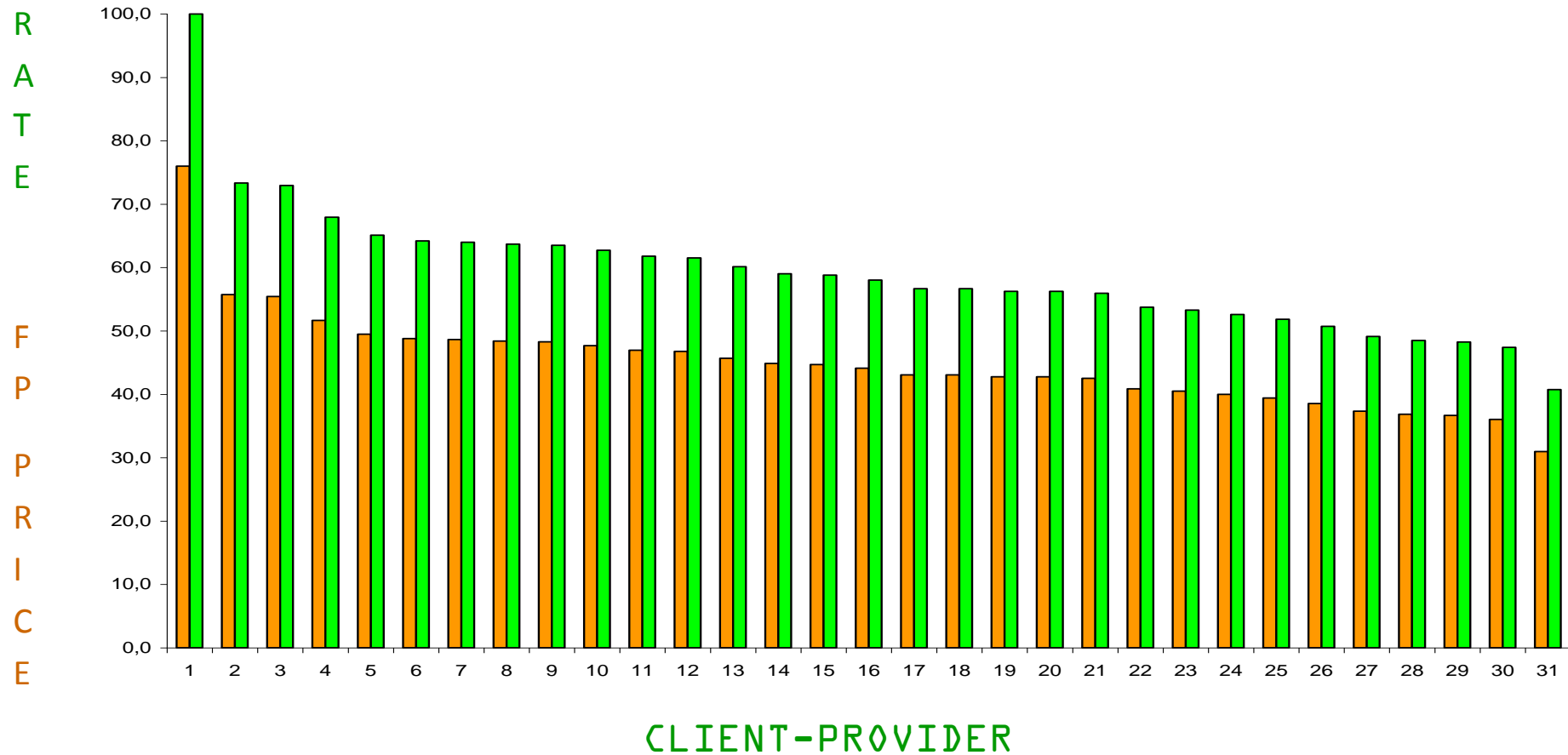
1 The relation between FP and Rate is not logical



- This is the ranking of the sample's rates.

Results:

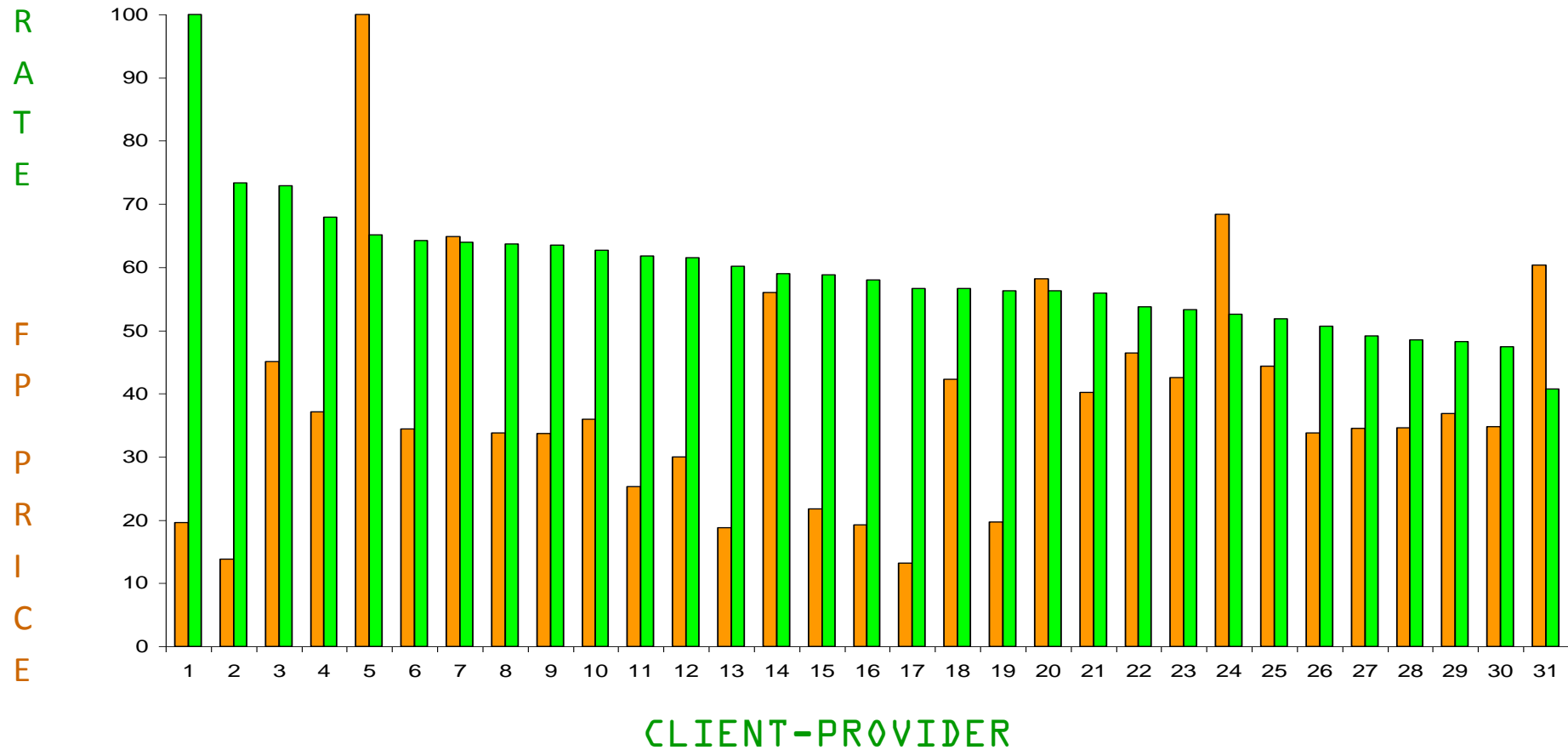
1 The relation between FP and Rate is not logical



- This would be the expected result of the relation between Rate/FP Price.

Results:

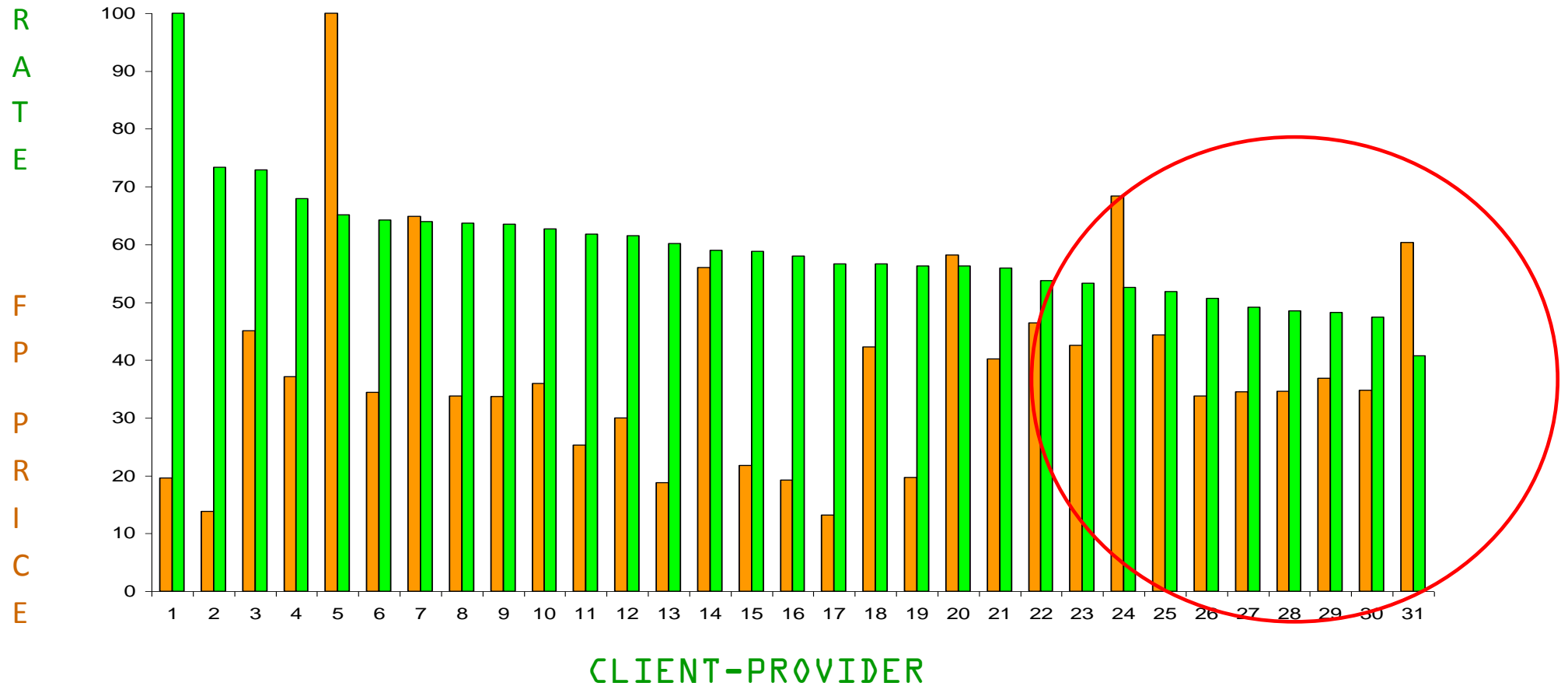
1 The relation between FP and Rate is not logical



- This is the actual result

Results:

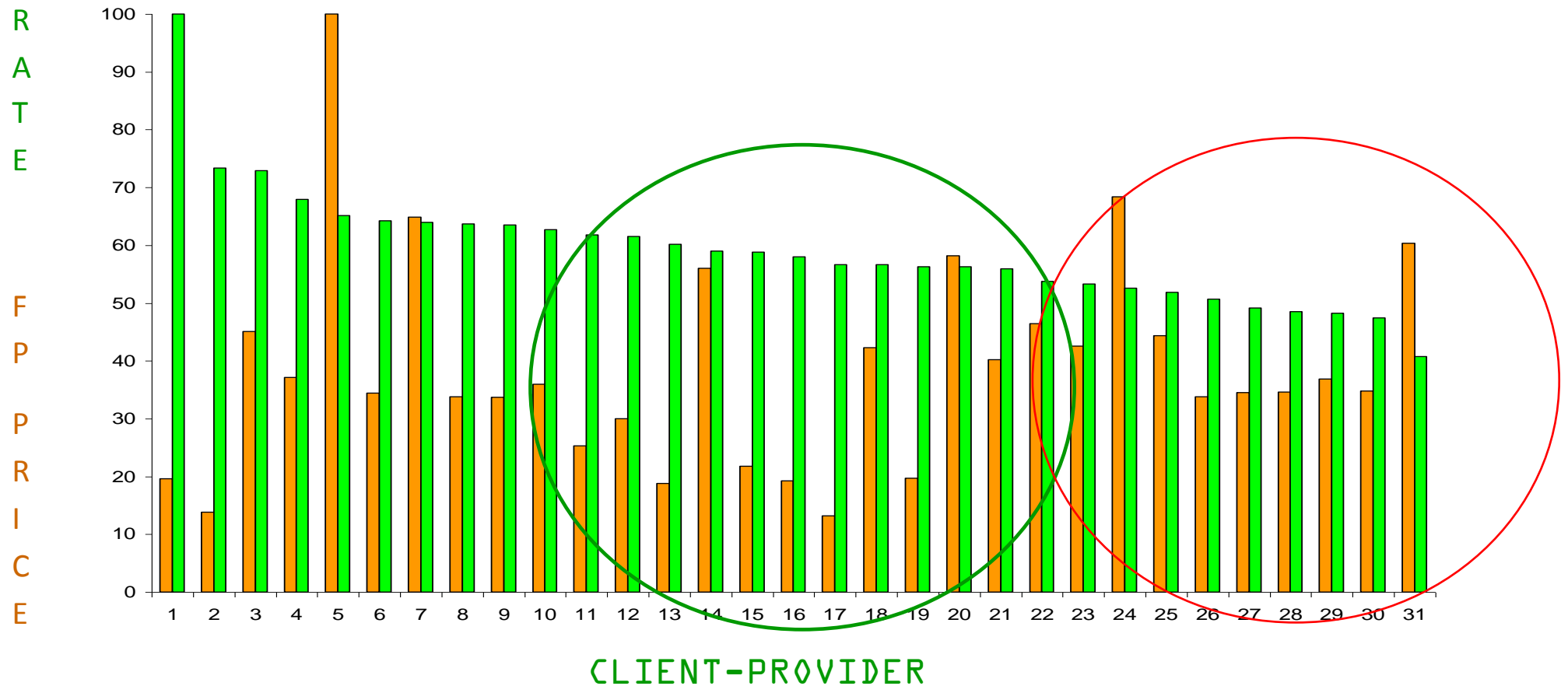
1 The relation between FP and Rate is not logical



- Low rates have high FP Price.

Results:

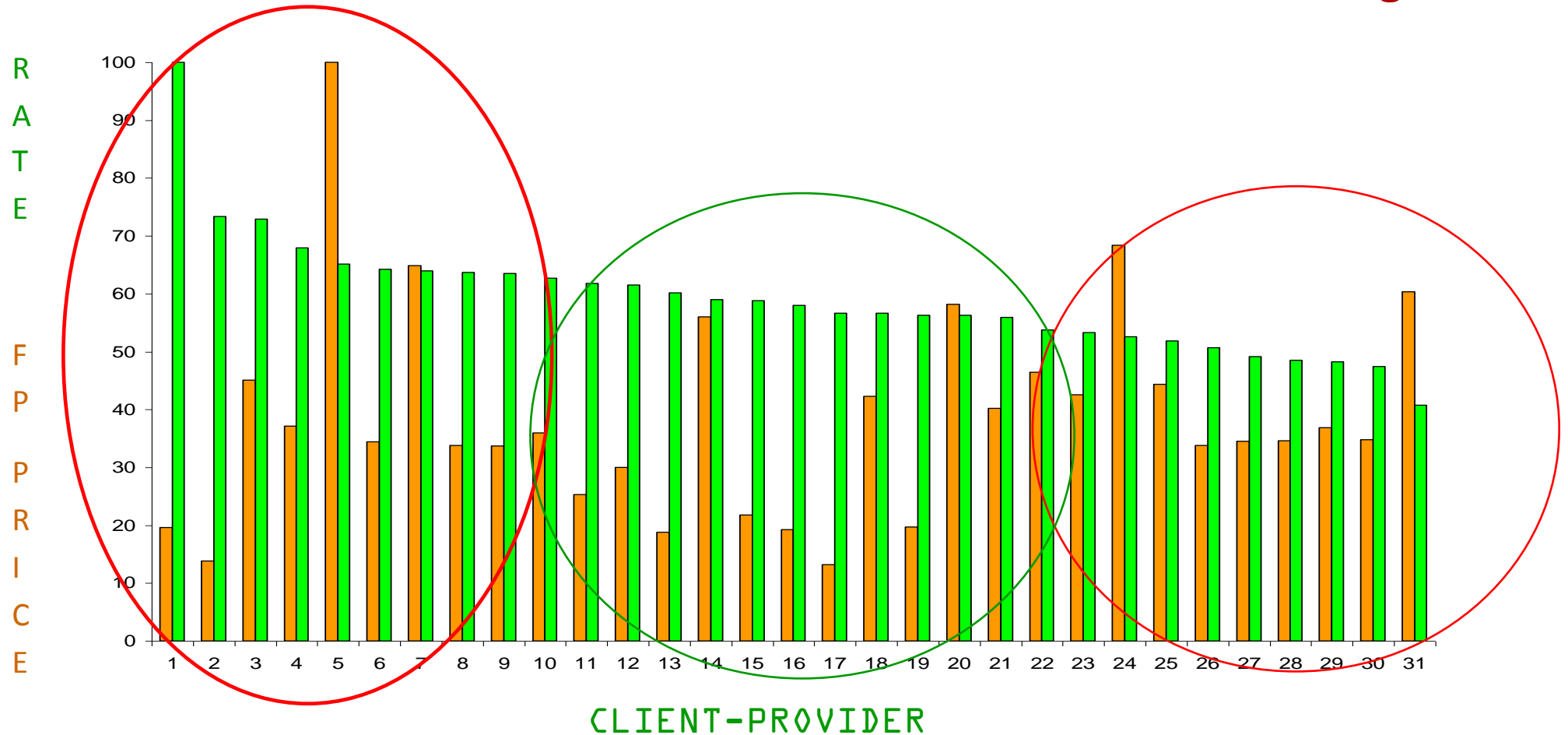
1 The relation between FP and Rate is not logical



- Low rates have high FP Price.
- Medium rates have generally low PRICES (much lower than low rates).

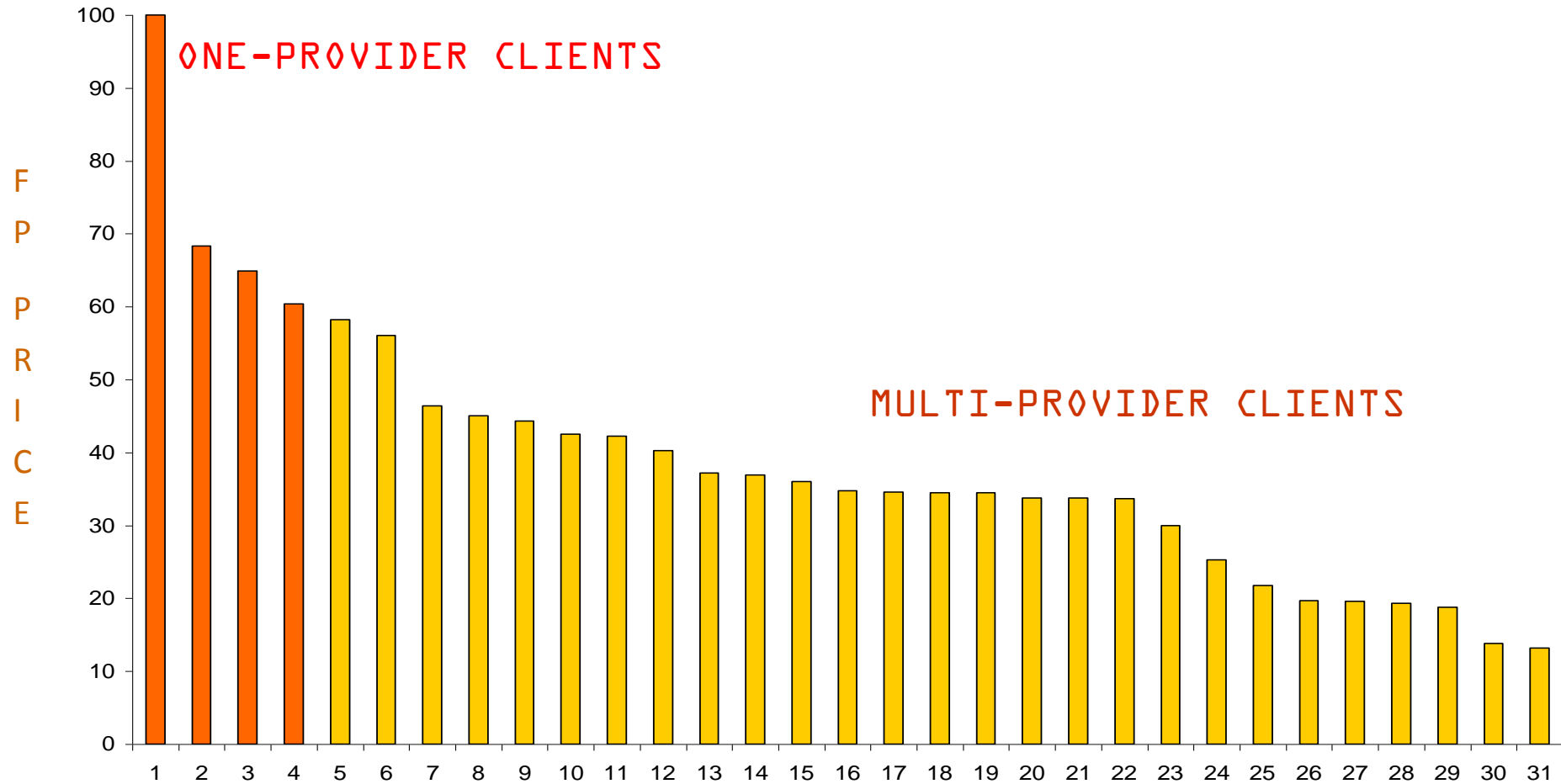
Results:

1 The relation between FP and Rate is not logical



- Low rates have high FP Price.
- Medium rates have generally low PRICES (much lower than low rates).
- High rates have very low PRICES and very high PRICES.

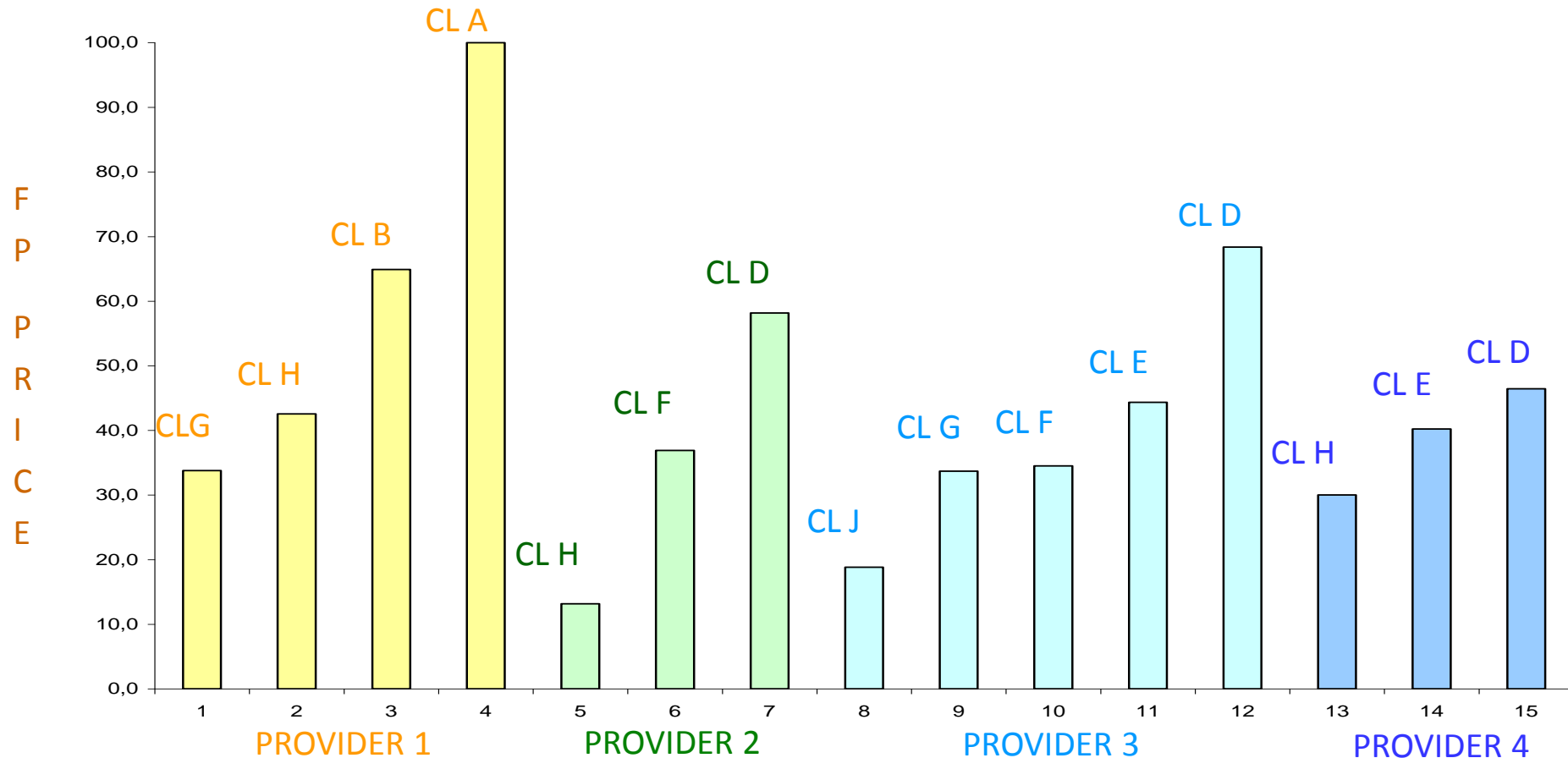
Results: 2 The price of the FP using only one provider is higher



Even though the chart looks “too perfect”, it is real.

Results:

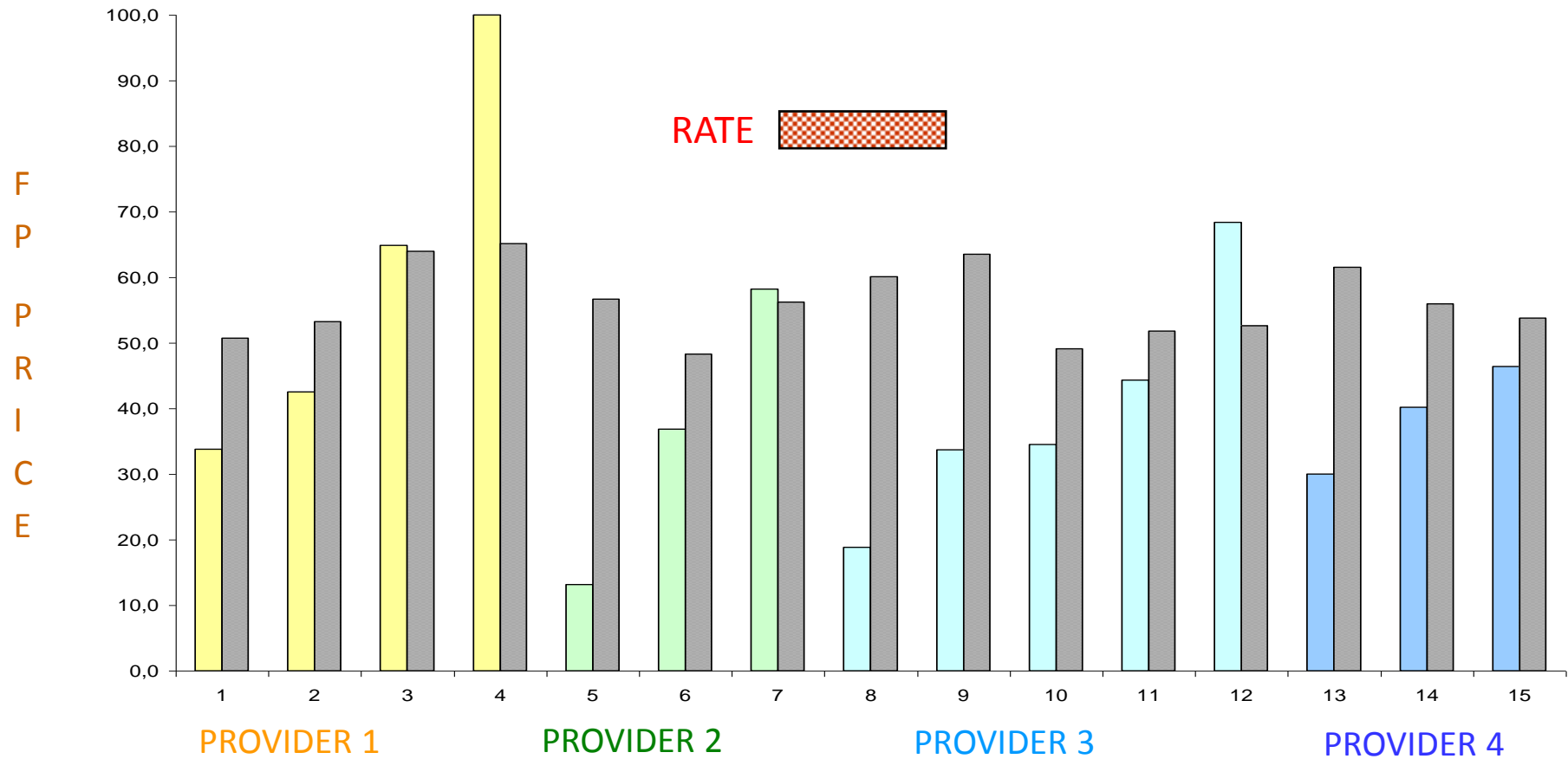
3 The behaviour of the providers is uncertain



- The differences in FP price among the various clients are clearly unjustified.
- The differences within the clients should not have this impact.

Results:

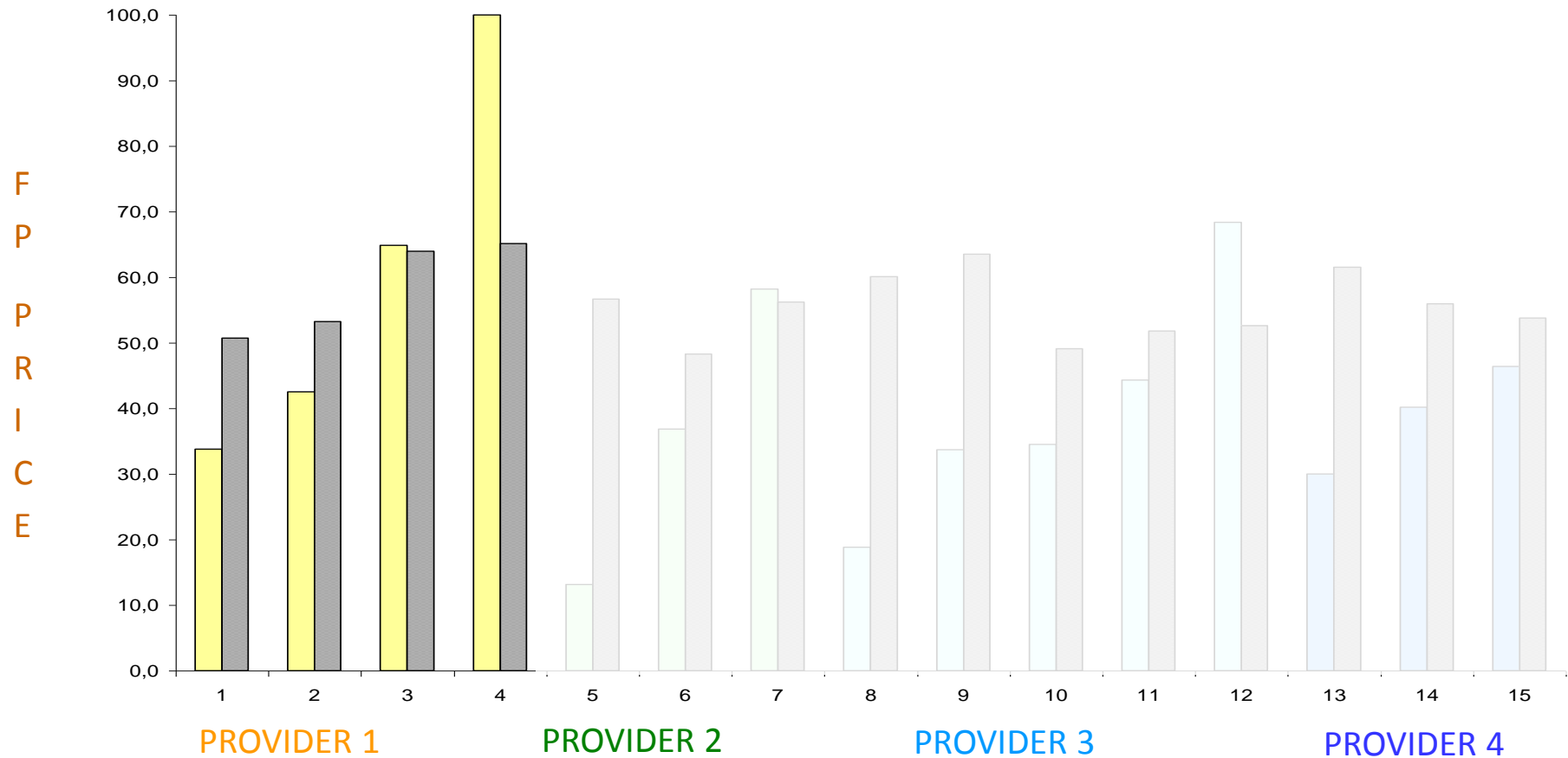
3 The behaviour of the providers is uncertain



- When we include the rates, the results become even more odd.

Results:

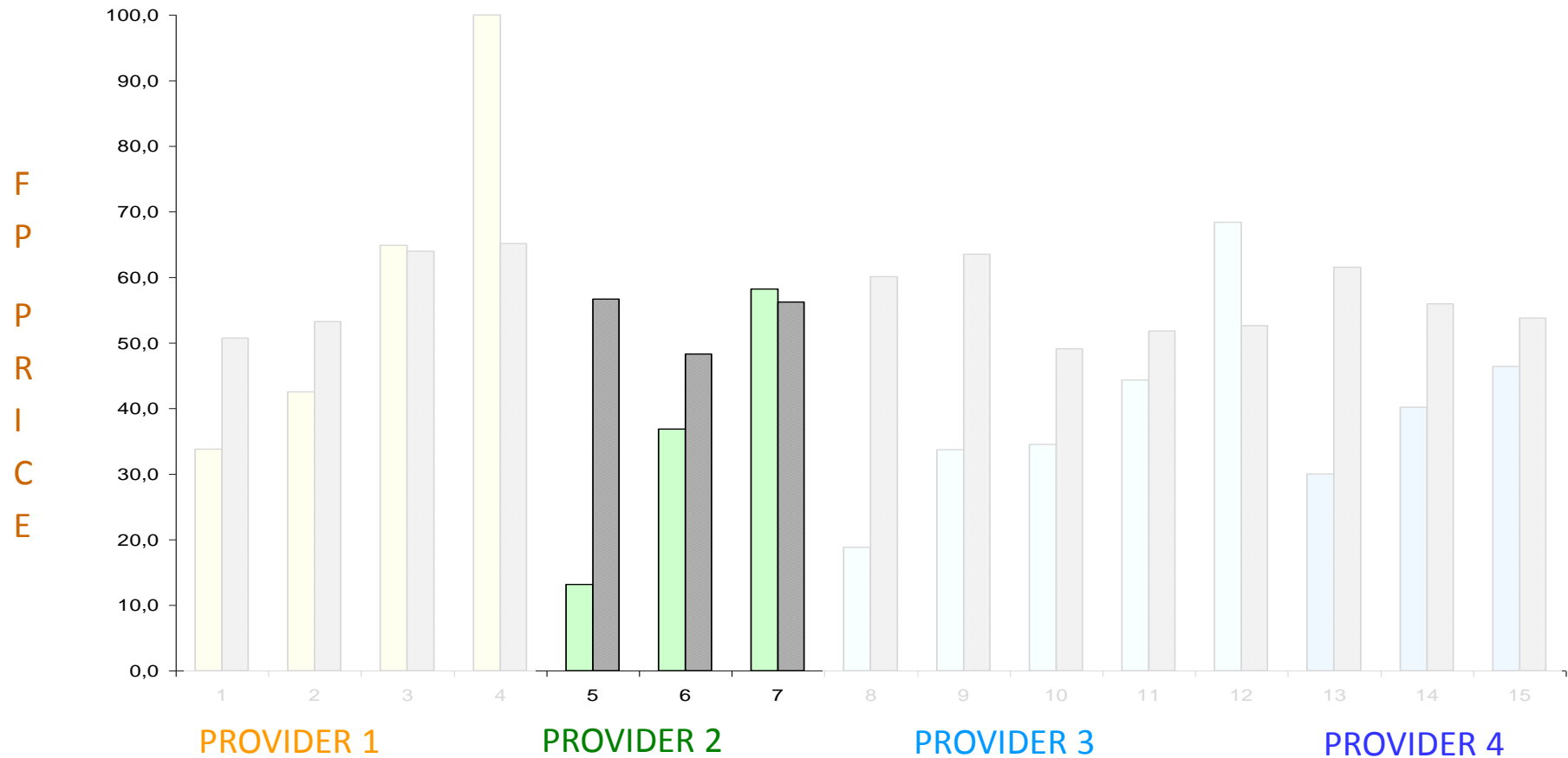
3 The behaviour of the providers is uncertain



- The relation of the rates in this provider (higher vs lower) is 1,3.
- Between PF PRICES the relation is 3.

Results:

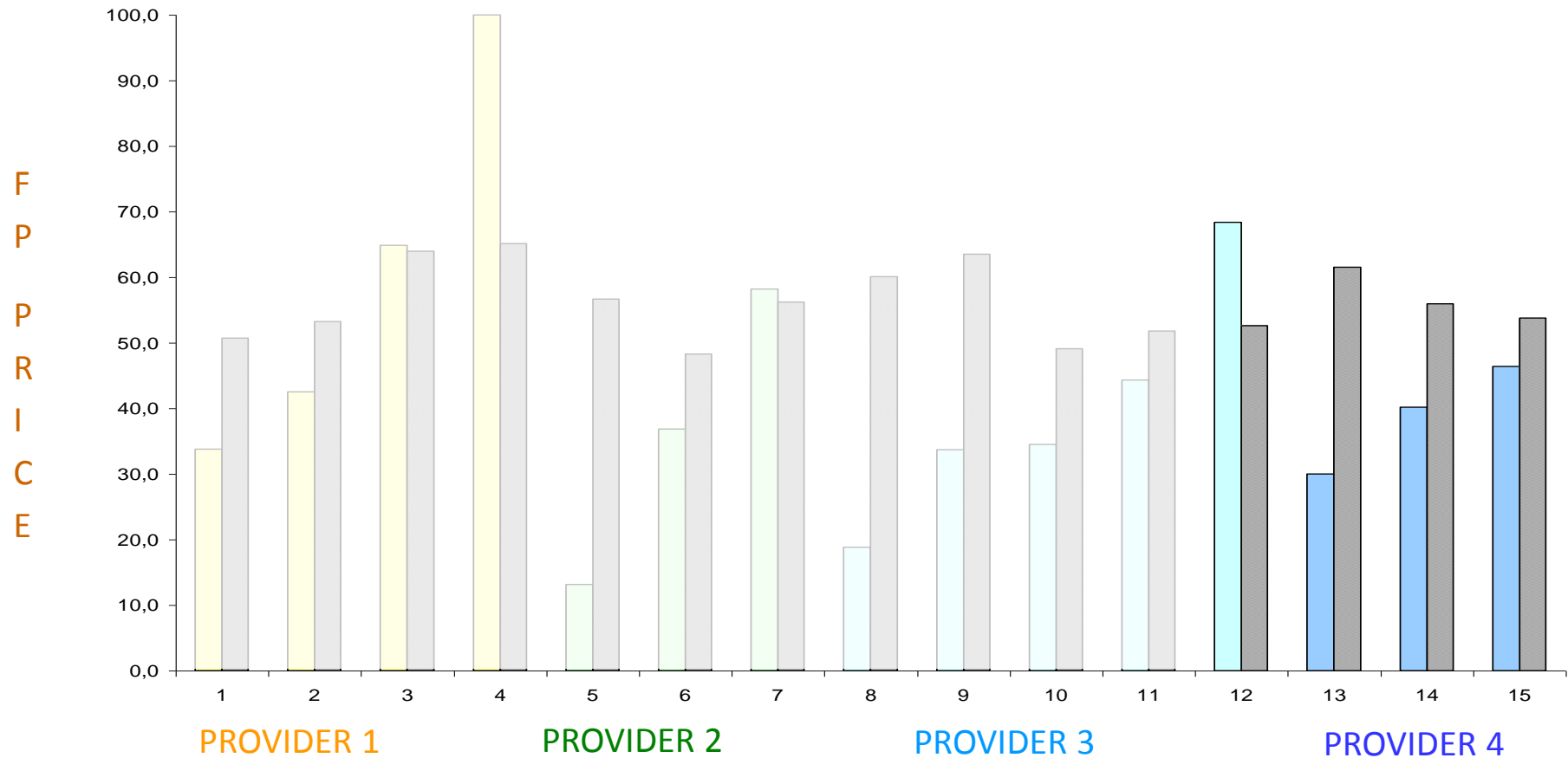
3 The behaviour of the providers is uncertain



- This provider has similar rates for its three clients.
- However, the higher FP PRICE is 4,4 times the lowest.

Results:

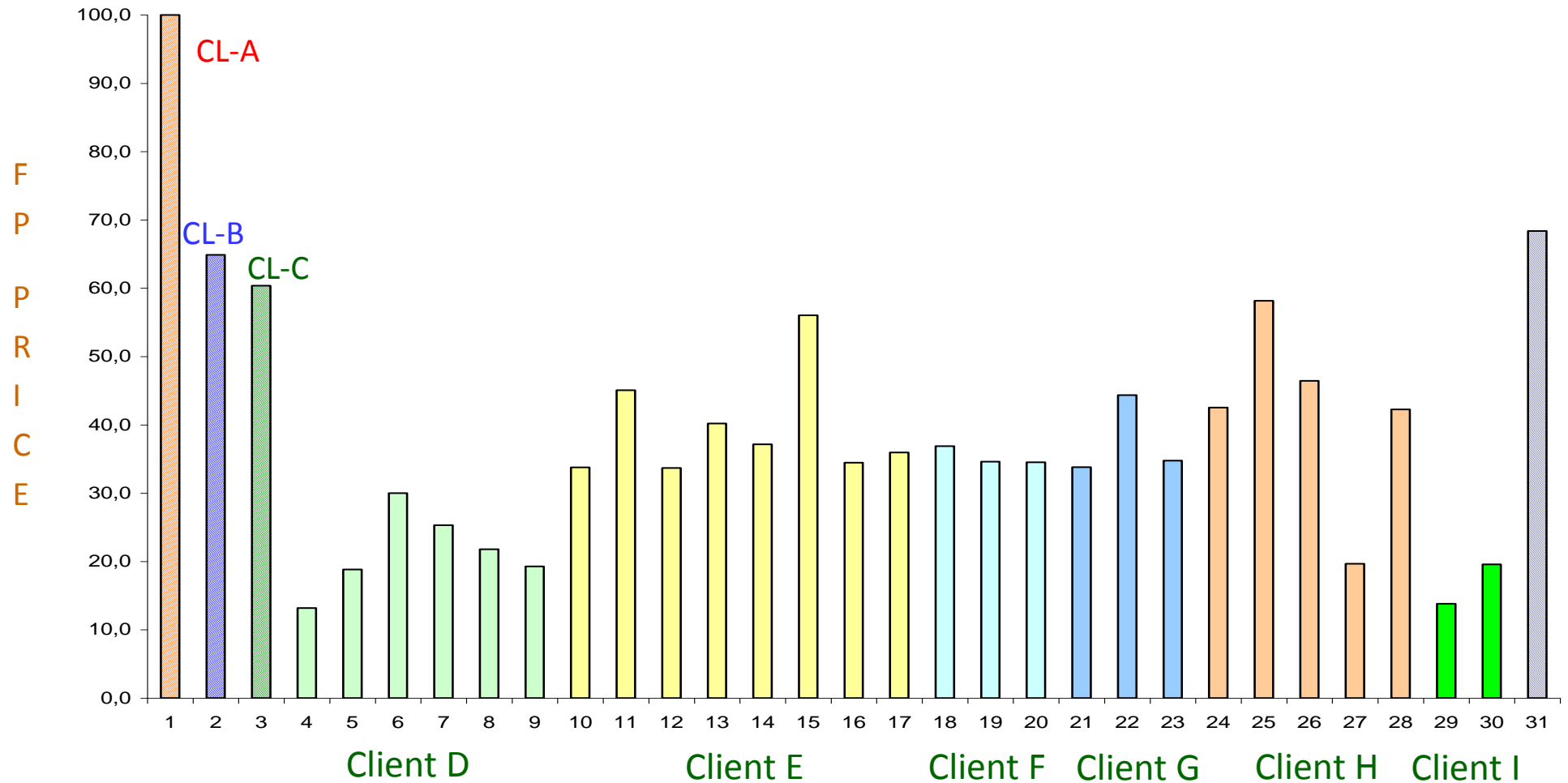
3 The behaviour of the providers is uncertain



- In this provider, the higher the rate, the lower the price for the FP (not bad).
- And the highest PRICE is only 1.5 the lowest.

Results:

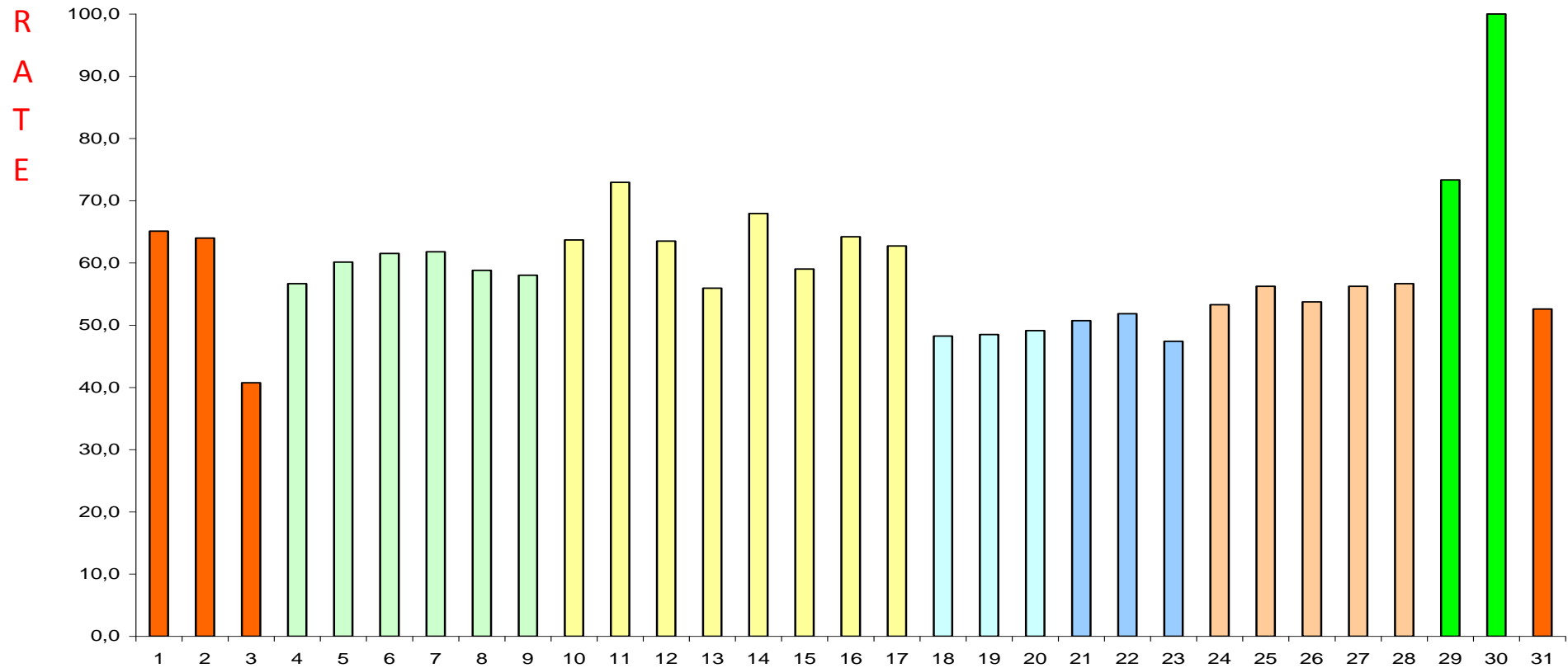
4 When looking at the Clients, the situation changes



- The price of the Function Points does not vary so much for each client, because they control it.
- It changes between clients (because they do't share information, its not a standard)

Results:

4 When looking at the Clients, the situation changes



- The rates have a similar stability for each client Moreover, they are similar between clients. This leads us to both obvious and important conclusion:

At the market there are references when talking about rates, on the other hand, there are no references when it comes to FP price.

Conclusions:

Before dealing with the conclusions we need to answer two questions:

Do the differences between the clients justify the detected inconsistencies?

Are these results significant for other countries?

Conclusions:

Do the differences between the clients justify the detected incongruence's?

1. The client's maturity level is similar.
2. So is the type of the contracts.
(Big maintenance contracts based on small petitions)
3. The competence of the providers is high, and similar.
4. Their activities within the clients is similar. (And in any case it's been homogenized)
5. Both technological platforms and systems structure are very complex (Size + history). But there is no relation between the complexity and the FP price. (Sometimes , inverse)
6. Although the concepts used are pretty similar, the management of the contracts is relatively different. There is also no proportionality between management complexity and FP price.

The differences do not justify the inconsistencies

Conclusions:

Are these results significant for other countries?

1. The most significant companies of the sample are multinational.
2. In some cases, the FPR are identical with others around the world.
3. In others, they answer very complete procedures of providers management that are applied all over the world.
4. Many of the providers work for the same clients in different countries.
5. In many cases the providers use out of Spain software factories (India, Latin-American) which give support to different countries.
6. When we introduce ISBSG data in our benchmarking, the local data is consistent with the one from ISBS.
7. There might be local differential characteristics regarding three aspects:
 - Salaries.
 - Productivities.
 - Training.

Accepting local variations, the results should be generally applicable to a wider context.

Conclusions (I):

- The clients do not manage the product, they manage the rates instead:
 - There is no logical relation between rates and FP.
 - The rate concept is far more ingrained than the concept of FP.
- Pressure to lower rates ends up in lower productivity and higher FP price.
- The concept of Software Production (or the measure of the software produced) appears as “islands” of clients, unconnected between each other.
- Our clients do not use, or do not know about standards related to productivity measurement.
- The providers run away from productivity measurement and standards.
- Software production keeps being basically artisanal.
 - IT is the only Industry which does not control the product nor the production.
- The industrialization of software development is a myth (with commercial purposes) rather than a reality.

Conclusions (II):

- It is vital to advance in the concept of “product software management” so that the software development evolves towards industrialisation.
- For this to happen it is necessary to generate the production measure based on the only real and existing standard: the FP.
- We have to extend FP as the basic metric to measure the product for IT Governance.

FP are the only metric that can measure quality, productivity, costs, value and economics without distortion. (Capers Jones)

FP can improve the professional status of software and turn “software engineering” discipline instead of a craft as it is today. (Capers Jones)

- Advancing in the definition of complementary metrics for aspects not covered with FP is also important.
- The basic step in the process of spreading these ideas is to publish and share all the information possible in order to convert the theoretical standards into the market standards.
- The more benchmarks we can do, publish, and use, the more we contribute to the TI industrialisation.

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