

ECONOMIC COOPERATION AND DEVELOPMENT PROCESSES

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ABSTRACT

Opportunity cost is closely related to the idea of time constraints. One can do only one thing at a time, which means that, inevitably, one is always giving up other things. The opportunity cost of any activity is the value of the next-best alternative thing one may have done instead. Opportunity cost depends only on the value of the next-best alternative. It does not matter whether one has five alternatives or 5,000.

Opportunity costs can tell when not to do something as well as when to do something. For example, one may like waffles, but like chocolate even more. If someone offers only waffles, one would take it. But if offered waffles or chocolate, one would take the chocolate. The opportunity cost of eating waffles is sacrificing the chance to eat chocolate. Because the cost of not eating the chocolate is higher than the benefits of eating the waffles, it makes no sense to choose waffles. Of course, if one chooses chocolate, they are still faced with the opportunity cost of giving up having waffles. But one is willing to do that because the waffle's opportunity cost is lower than the benefits of the chocolate. Opportunity costs are unavoidable constraints on behaviour because one has to decide what's best and give up the next-best alternative.

Price theory

Microeconomics is also known as price theory to highlight the significance of prices in relation to buyer and sellers as these agents determine prices due to their individual actions. Price theory is a field of economics that uses the supply and demand framework to explain and predict human behavior. It is associated

with the Chicago School of Economics. Price theory studies competitive equilibrium in markets to yield testable hypotheses that can be rejected.

Price theory is not the same as microeconomics. Strategic behavior, such as the interactions among sellers in a market where they are few, is a significant part of microeconomics but is not emphasized in price theory. Price theorists focus on competition believing it to be a reasonable description of most markets that leaves room to study additional aspects of tastes and technology. As a result, price theory tends to use less game theory than microeconomics does.

Price theory focuses on how agents respond to prices, but its framework can be applied to a wide variety of socioeconomic issues that might not seem to involve prices at first glance. Price theorists have influenced several other fields including developing public choice theory and law and economics. Price theory has been applied to issues previously thought of as outside the purview of economics such as criminal justice, marriage, and addiction. A study of the gas motion through the froth of a prototype bi-dimensional flotation cell was performed. Using video and image analysis techniques, surface velocity data measured with a Visio froth system were validated by comparing those results with estimations from manually tracking the motion of the bubbles on the froth surface. Images used to manually track the bubbles were recorded using a high-speed video camera. In addition, discharge velocity profiles were measured as a function of the froth height over the launder lip for two froth Crowder angles and two superficial air rates. An increasing froth discharge velocity from the lip level up to the top of the froth was observed. Based on these results, the air recovery was estimated using the velocity profile and these values were compared with those obtained using the surface velocity estimation. Results showed differences from 24% to 47% in the air recovery when the froth flow area at lip was employed. However, both approaches presented the same trend when the J_G and the froth Crowder angle

were changed. Using the top-of-froth velocity along with the froth flow area at the Visio froth location allows air recoveries to be closer to those obtained from the discharge velocity profile at lip.

The water flowrate in concentrate was estimated from operational variables and compared with the water flowrate measured in the concentrate stream. A good agreement was observed when the discharge velocities obtained from the Visio froth measurements along with the froth height over the lip at the measurement point were employed. Similar results were obtained when the water flowrate was estimated using the discharge velocity profile at lip.

An increase in the air recovery as a function of the froth Crowder angle and the J_G value was observed. Also, the combined effect of these variables showed a significant impact on the air recovery. A higher concentrate water flowrate was observed when a higher air recovery was obtained. This result favors the concentrate grade decreasing due to the entrainment of non-valuable fine particles. A proper flotation equipment design along with an optimizing control system can improve the metallurgical results in terms of mineral recovery and concentrate grade.

The froth zone has an important role in the performance of flotation equipment because of its effect in the concentrate grade and mineral recovery. Due to the impact that the froth zone has on metallurgical results, several studies have been conducted to describe the froth transport mechanisms.

The vision devices are based on image analysis and can measure froth velocity, bubble size on the froth surface, froth stability, colour histograms and other properties. This control target can be achieved by suitable adjustments of the air flowrate and/or the froth depth, subject to a concentrate grade range or other process constraints.

In this paper, the froth behaviour in the discharge of a bi-dimensional cell (air–water system) was studied to evaluate the air recovery estimation. First, the method proposed by Hadler et al. was employed to estimate air recovery using froth discharge velocity obtained by a Visiofroth system. On the other hand, bubbles observed on the side of the cell over the launder lip were manually tracked with a high-speed video camera to obtain a froth discharge velocity profile.

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