## Free Services in the Netherlands

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The rise of the digital economy in recent years has greatly affected our daily lives. It has impacted our personal wellbeing by providing us with new services, goods, and sources of information. It also caused many structural changes in most sectors of the economy. These rapid changes to the economy have led to concerns among economists: considering these large-scale developments, are we still measuring the size of the economy correctly? This question has often been related to the productivity puzzle, the unexplained decline in productivity growth ever since the financial crisis of 2008/2009. As the measurement of productivity growth depends on the national accounts, a possible explanation for declining productivity growth could be a mismeasurement in these national accounts incurred by changes not captured in the existing framework.

A particular growing phenomenon that leads to measurement issues are free services. Free entertainment has been a conceptual problem for the national accounts since way before the digital age (Cremeans, 1980), but the digital revolution has led to a sharp increase in the size, value, and use of free services. Goods and services without a price are problematic in the national accounts framework because they cannot be readily measured in terms of value. While some free services do involve economic activity that is "visible" in market transactions, such as advertising costs of businesses, the consumer side of free services (due to digitalization) which is uncaptured in the national accounts could therefore potentially explain part of the decline in productivity growth.

In this paper we aim to measure the size of free services in the Netherlands in a manner that is consistent with the national accounts framework. In order to do this we first define what exactly free services are, and examine in which ways they can be measured consistently with the SNA. We present a framework to identify free services, its suppliers and users, as well as the business models that could be used to produce these free services. Finally, we investigate whether there is a significant contribution of free services to the Dutch economy, and whether they significantly affect GDP.

This investigation goes down two paths. One path is the application of final consumption by businesses as proposed in the SNA 2008 Research Agenda (United Nations, 2008). For this we

look at certain occupations, assumed to generate free services, employed in different industries. We will show estimates of the size of free services for the years 2015 through 2019. Preliminary results of this approach show a share of GDP of about 3-4% for the value of free services. The other path is a novel approach which we will call "free services margins". Free services margins are to represent the free services that have replaced paid-for goods and services, bridging the gap between observed quality-adjusted prices on the production side and perceived quality of total consumption on the consumer side. We will present analyses applying both these methods to the Netherlands.