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A purchasing power indicator as a tool for predicting market attractiveness for SMEs in a changing currency environment

Jacek Wachowicz

Gdańsk University of Technology, Poland, Management and Economics Department,
ul. G. Narutowicza 11/12, 80-952 Gdańsk, Poland
jacek.wachowicz@zie.pg.gda.pl

Abstract. E-commerce gave SMEs possibility to act over the international markets. However, this introduced some new threats to business operations. Apart of technological, knowledge, workforce, increased competition they need to face changes of exchange rates and conjuncture fluctuations. This paper presents a concept of simple indicators, which may very quick select markets of a great potential due to financial market changes.

Introduction

Since its introduction, Web technologies have changed business strategies. They increased opportunities in doing business over the borders and created new economical markets. Surrounding conditions however may threat future international market development. During last few years markets observed massive changes in currency exchange rates, which caused extreme pressure in international trade efficiency. As we see the situation is getting less and less stable, the urgent need for creating an easy and complex factor allowing to determine in which direction market situation is changing, which might help determining profitability in international trade. As one can observe relative appreciation of some currencies and depreciation of others, usually there is only information of currency changes against only the local currency. This doesn't give any information on changes between other currencies, which may mislead in future prognosis (just like changes in parities between PLN/USD and PLN/EUR might be often far more influenced by changing USD/EUR parity rather then by a condition of Polish economy). In such environment no information is given allowing quick understanding, which markets are getting cheaper (more attractive as import sources) and which are getting more expensive (more attractive as export destinations). As a solution is proposed a complex index (Monetary Factor MF), which should show which currency is getting stronger (appreciates) against most of other currencies and which is getting weaker (depreciates) against most of other currencies – and shows relative changes of purchasing power for a currency under examination. In particular this shall ease understanding if the local currency appreciates or depreciates in case of different currency shifts (for instance in case of appreciation against USD and depreciation against EUR). This might turn much easier strategic financial planning in companies targeting international markets.

E-commerce revolution

Introduction of http:// protocol together with first graphical Web browser initiated unexpected introduction of Internet as a new business media, which begun a couple years later a true revolution in business. It gave possibility of worldwide communication at almost no cost. This drove creation of new digital markets with more and more services and goods offered through Internet. It allowed introduction of many digital substitutes (like digital music, movies, maps etc.) and creation of brand new markets (like information browsing, digital content or TCP/IP bandwidth delivery, VoIP services and many others). Computers and Internet brought many companies to become largest players of world's stock exchanges – just to mention corporations like Microsoft, Sun, Cisco, Dell, Google, Yahoo, eBay or may others.

On the other hand Internet created a huge demand on individual services and products. This gave a huge opportunities for Small and Medium Enterprises. Special favor for SMEs gives typical demand for highly-professional and individual products and services, which was driven by Internet. On the other hand ease of communication and digitalization of goods drove Internet markets to become more ad more international. This is always regarded to be a huge benefit of including this new channel into business strategy. Unfortunately it brings quite a lot of threats on the other hand. First of all, entering the global internet markets expose companies to international competition. This is supposed to force intensed price pressure. It force increased flexibility in terms of product specification and required time to delivery. Moreover it expose companies to threats of international culture, legal and tax differences. Internet and e-commerce raised a lot of problems in these fields and many of them seems to be either not solved or very difficult to judge, especially for SMEs, companies that can't hire specialized lawyers for searching answers to difficult, international legal aspects.

One can find some more fields of potential threats on the electronic business frontier. Especially difficult seem to be the ones that generate extra costs. This might be considered safety problems (due to virus or hacker attacks and hardware failures), knowledge problems (caused by lack of skilled workforce), and things far beyond of companies control – like currency exchange rates. The last one may be reduced by using proposed in this paper model of currency weight.

SME adoption

Small and Medium Enterprises are a very special sector of economy. They employ most of workforce worldwide. Their great feature is ability to adapt to changing economical environment. This turns them and – because of their number - the whole economy far more flexible and adaptable. This feature is as well a major force making SMEs to grow. But on the other hand SMEs are very limited in their activities. The most commonly pointed limitations are modest financial resources, dependency on owner's knowledge and initiative, inability in creation of big research projects. It makes introduction of cutting edge new technologies very difficult and slower (at the average) then in large companies.

Adoption of internet technologies into SMEs strategies and operations turned them to be far more dependant to changes in global economy. This affects SMEs – and as

statistics show, they are trying to expand exports activities, in which e-commerce activities may be of help. Following statistics may confirm that (Tables 1-3).

Table 1: Exports vs. GNP 2000–2006 (goods and services)

	2000	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**
GDP dynamics [%]	**4,0**	**1,0**	**1,4**	**3,8**	**5,3**	**3,4**	**6,1**
GDP [bln PLN]	684,9	721,6	781,1	814,7	923,3	980,9	1057,7
Exports [bln PLN]	201,5	211	231	280,8	346,4	364,5	426,8
Exports/GDP [%]	**29,4**	**29,2**	**29,6**	**34,5**	**37,5**	**37,2**	**40,4**

Source: Przedsiębiorczość w Polsce [3]

Table 2: Export factors

employment	2000	2001	2002	2003	2004	2005	2006
Percentage of export incomes (%)							
10–49	3,0	4,0	6,0	7,3	8,0	8,0	8,0
50–249	6,0	7,0	9,0	11,9	12,0	12,0	13,0
>249	14,0	14,0	16,0	18,9	20,0	21,0	23,0
Wholesale incomes dynamice (%)							
10–49	108,7	101,8	98,2	100,3	116,7	101,1	109,3
50–249	115,0	97,9	99,2	109,4	118,0	101,8	111,5
>249	112,3	102,1	103,0	109,7	115,6	105,9	115,1
Export sales dynamice(%)							
10–49	83,7	109,4	209,8	121,6	107,8	92,0	115,7
50–249	140,3	102,9	144,5	143,9	112,2	103,6	114,4
>249	121,7	100,5	120,1	126,1	130,2	107,0	121,2

Source: Przedsiębiorczość w Polsce [3]

Table 3: Barriers In Developement for SMEs

Frequency of problems' observations In period:	Currency exchange rates, including their changes	Lack of qualified workforce	Resources and materiale prices growth	regulationsChanges In taxes and	High competition	Low demand	High salaries, salary pressure	Payment problems	Lack of liquidity
2Q2005	**26,8**	7,4	4,5	11,4	10,4	7,2	6,7	X	X
3Q2005	19,8	3,6	5,4	**13,6**	**12,6**	7,3	**7,6**	X	X
4Q2005	20,1	11,1	7,7	11,3	11,2	7,0	4,8	X	X
1Q2006	21,4	1,8	9,0	6,8	10,6	**10,0**	5,3	5,3	X
2Q2006	18,9	3,0	6,4	7,0	9,8	9,7	3,5	5,3	4,6
3Q2006	16,6	5,3	**10,5**	8,6	9,9	8,9	3,6	**6,1**	3,5
4Q2006	11,2	10,1	10,1	7,0	8,2	7,0	4,3	5,9	3,8
1Q2007	15,2	**10,7**	9,8	8,5	9,0	5,9	**5,2**	4,9	**4,9**
2Q2007	10,7	**10,7**	9,7	7,6	7,2	5,3	5,1	4,1	3,0

Source: Przedsiębiorczość w Polsce [3]

Model

As changes in currency markets turned to be significant and more rapid, the necessity for easy understanding of their nature and consequences for the international sales arises. Presented model should allow easy and fast determination of changing terms of trade, which is necessary for a medium to long-term planning of operations.
For building a model we need to explain some basic assumptions. It should give a quick answer if a currency gains or looses purchase strength.
Let us count a general base of currencies:

$$B_c = \sum_i M_i \cdot e_{i,c} \qquad \textit{(Equation 1)}$$

where c is the currency used for calculation, B_c – is a monetary base counted in currency c, M_i is monetary measure for the i-th currency, $e_{i,c}$ is an exchange rate between i-th currency and currency c.

$$MF_x = \frac{M_x \cdot e_{x,c}}{B_c} \qquad \textit{(Equation 2)}$$

Where MF_x is searched Monetary Factor, showing a purchasing power, for the currency x.
For having Monetary Factor calculated we need to choose a base currency c, which needs to have data on exchange rates of the base currency to other currencies, including the one that is of interest.
For calculation we need to have data on monetary base as well. Commonly used monetary aggregates are M0, M1, M2, M3. Their definitions are: [1]

- M0 is the most strict one and contains only money in circulation (i.e. excluding cash held by banks)
- M1 comprises money in circulation (i.e. excluding cash held by banks) and demand deposits of the non-financial sector, which covers state enterprises, private enterprises and households.
- M2 comprises monetary aggregate (M1), time and saving deposits in zloty, saving bonds, and foreign currency deposits of the non-financial sector, which covers state enterprises, private enterprises and households.
- M3 comprises monetary aggregate M2, plus repurchase agreements and debt securities issued with maturity up to 2 years.

In most countries definitions and methodologies of M0 and M1 aggregates are similar; bigger differences may be seen within M2 and M3 aggregates.
Dynamic changes over markets may be observed in two natural points of view – relative and absolute. The second one is easier to measure, as it is enough to compare changes in monetary base growth throughout countries of interest. Of course this has to be done in one preferred currency, which is exchangeable to all other currencies, for instance USD. Then we have to compare changes. This might be done using equation 3.

$$A_{o,c} = M_o \cdot e_{o,c} \qquad \textit{(Equation 3)}$$

where o is the currency observed, $A_{o,c}$ – is a monetary base of observed currency o counted in currency c, M_o is monetary measure for the currency o, $e_{o,c}$ is an exchange rate between currency o and a base currency c
The relative growth may be calculated as a ratio of Monetary Factors of currencies x and o. This is illustrated on equation 4:

$$R_{o,x} = \frac{MF_x(n)/MF_x(n-1)}{MF_o(n)/MF_o(n-1)} \qquad \textit{(Equation 4)}$$

Outputs

For practical calculations we need to gain primary data. As it was already mentioned, the most comparable monetary base data is M0 and M1. We shall use the broader one – M1. The data is quoted by United Nations for years 2004 and 2005. The exchange between them and USD shall be quoted by OECD. Because of the space limitations, in tables is presented data for countries with biggest M1 measures – and for Poland.

Table 4: Monetary measure M1 in selected countries

Country	M1 (2004)	M1 (2005)
Australia	2,4395E+11	2,689E+11
Canada	3,9571E+11	4,1635E+11
China	9,5815E+12	1,069E+13
France	3,5747E+11	3,9603E+11
Germany	6,4654E+11	7,1624E+11
Italy	5,4625E+11	5,9056E+11
Japan	4,1241E+14	4,3629E+14
Netherlands	1,5848E+11	1,7875E+11
Spain	2,2399E+11	4,4068E+11
Switzerland	2,2406E+11	2,3856E+11
United States	6,7809E+11	6,3552E+11
Poland	1,461E+11	1,7483E+11

Source: Unated Nations Statistics Division [4]

Table 5: Exchange rates in selected countries

Country	currency /USD (2004)	Currency /USD (2005)
Australia	1,359233	1,312783
Canada	1,301092	1,211708
China	8,276801	8,194317
France	0,8048583	0,804625
Germany	0,8048583	0,804625
Italy	0,8048583	0,804625
Japan	108,1469	110,0971
Netherlands	0,8048583	0,804625
Spain	0,8048583	0,804625
Switzerland	1,242742	1,245942
United States	1	1
Poland	3,650867	3,234025

Source: OECD Main Economic Indicators [2]

As a next step the comparable monetary bases shall be calculated. This shall be calculated in USD:

Table 6: Comparable monetary measure M1 in selected countries

Country	M1 (USD,2004)	M1 (USD,2005)
Australia	1,7948E+11	2,0484E+11
Canada	3,0413E+11	3,4361E+11
China	1,1576E+12	1,3046E+12
France	4,4414E+11	4,922E+11
Germany	8,0329E+11	8,9015E+11
Italy	6,7869E+11	7,3396E+11
Japan	3,8134E+12	3,9628E+12
Netherlands	1,9691E+11	2,2216E+11
Spain	2,783E+11	5,4768E+11
Switzerland	1,8029E+11	1,9147E+11
United States	6,7809E+11	6,3552E+11
Poland	4,0017E+10	5,4061E+10

Then we can calculate Monetary Factors for all currencies. This was done using only 6 currencies with biggest monetary base (narrow Monetary Factor – nMF) and using 22 currencies (broad Monetary Factor - bMF). As we can see, they are very coparable.

Table 7: Monetary Factors for selected countries

Country	nMF (2004)	bMF (2004)	NMF (2005)	bMF (2005)
Australia	0,02517	0,01847	0,02721	0,01911
Canada	0,04265	0,03129	0,04565	0,03206
China	0,16234	0,11911	0,17332	0,12173
France	0,06228	0,04570	0,06539	0,04593
Germany	0,11265	0,08265	0,11826	0,08306
Italy	0,09517	0,06983	0,09751	0,06848
Japan	0,53476	0,39237	0,52648	0,36976
Netherlands	0,02761	0,02026	0,02951	0,02073
Spain	0,03903	0,02864	0,07276	0,05110
Switzerland	0,02528	0,01855	0,02544	0,01787
United States	0,09509	0,06977	0,08443	0,05930
Poland	0,00561	0,00412	0,00718	0,00504

Having Monetary Factors calculated we may search for the currency, which gained most purchasing ability. As it was pointed above, we may search for the currency that gained most in an absolute measures, or which gained greatest relative growth. Finally we may use the relative factor to check which currencies are relatively faster gaining purchasing power comparing to the one of our interest. As an illustration, in the third column one may find such factor calculated for Polish Zloty (PLN). Factor grater than 1 means that the observed currency was gaining purchasing power faster then Polish Zloty – surprisingly the only one currency that was gaining it faster then

Polish Zloty was Euro issued in Spain, which may indicate that Spain may be very interesting market to enter, as there should be a lot of money searching to be spent. On the other hand, the greatest absolute gains of purchasing power were observed in Spain (again) and China and Japan. A very tight monetary situation might have been observed in United States, which might suggest a tough market to win contracts (due to shrinking purchasing power over the market).

Table 8: Monetary indicators for selected countries

Country	x(2005) -x (2004)	MF(2005)/ MF(2004)	[MF(2005)/ MF(2004)] / [PLN(2005)/ PLN(2004)]
Australia	2,5359E+10	1,03498063	0,84481797
Canada	3,9473E+10	1,02454686	0,83630125
China	1,4696E+11	1,02197235	0,83419977
France	4,8062E+10	1,0049824	0,82033147
Germany	8,6862E+10	1,0049088	0,8202714
Italy	5,5267E+10	0,98069503	0,80050656
Japan	1,494E+11	0,94237591	0,76922802
Nethe rlands	2,5253E+10	1,02314995	0,83516101
Spain	2,6938E+11	1,78463155	1,45673142
Switzerland	1,1181E+10	0,96308872	0,78613515
United St ates	-4,2573E+10	0,8499136	0,69375432
Poland	1,4043E+10	1,22509306	1

Conclusion.

Presented Monetary Factors calculation may be a simple tool for quick international market review in terms of searching for the best possible markets for gaining international contracts. They allow easy observation of currency purchasing power changes.This should be taken into account in phase of planning the whole e-commerce strategy, especially in a SMEs sector, as they cannot use a very complex analytical tools for international situation observations and prognosis.

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