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Od Mao Zedonga do Xi Jinpinga. Cechy, cele, kierunki i narzędzia zagranicznej polityki gospodarczej Chińskiej Republiki Ludowej

Katarzyna Twarowska*

Wstęp

Rola Chińskiej Republiki Ludowej (ChRL) na arenie międzynarodowej dynamicznie się zmienia. Jeszcze nie tak dawno kraj ten – uzależniony od inwestycji zagranicznych oraz dostępu do technologii – był biorcą pomocy. Obecnie to Chiny¹ stają się czołowym inwestorem oraz eksporterem nowoczesnych osiągnięć technologicznych. Wzrost siły gospodarczej przekłada się również na umocnienie pozycji politycznej ChRL – przywódcy kraju coraz odważniej bronią własnych racji oraz interesów kraju na świecie.

Potencjał zarówno gospodarczy, jak i polityczny Chin rośnie. Szacuje się, że w 2014 r. Chiny będą największą pod względem PKB (PPP) gospodarką na świecie² (wykres 1). Mieszkańcy Chin stanowią ponad 19% ludności świata, co plasuje kraj na pierwszym miejscu³.

Michael Snyder⁴ wskazuje inne dziedziny, w których Chiny zajmują pozycję światowego lidera; Chiny od lat są największym eksporterem na świecie, liderem w produkcji energii słonecznej i wiatrowej, największym producentem złota, mają też największą liczbę doktoratów technicznych, coraz więcej patentów i publika-

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¹ W opracowaniu używa się zamiennie określenia Chińska Republika Ludowa i Chiny, mimo że obecnie dwa państwa uznają się za prawowitych depozytariuszy chińskiej państwowości: Chińska Republika Ludowa i Republika Chińska na Tajwanie.

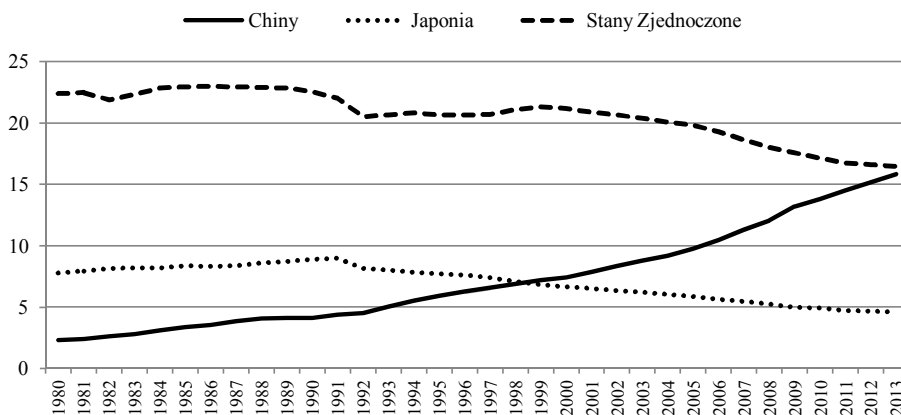
² Wykorzystując metodę, która bazuje na rynkowych kursach wymiany, można powiedzieć, że nadal największą gospodarką są Stany Zjednoczone, a Chiny to 55–60% gospodarki amerykańskiej.

³ OECD, OECD.StatExtracts, <http://stats.oecd.org> (data dostępu: 08.11.2014).

⁴ Snyder M., *The American Dream*, www.thedailysheep.com/not-just-the-largest-economy-here-are-26-other-ways-china-has-surpassed-america_102014#sthash.wrF012Yk.dpuf (data dostępu: 09.10.2014).

cji naukowych, największy rynek sprzedaży samochodów i posiadają największe rezerwy walutowe na świecie.

Wykres 1. Udział Chin, Stanów Zjednoczonych i Japonii w światowym PKB (PPP) w latach 1980–2013



Źródło: opracowanie własne na podstawie: International Monetary Fund, *World Economic Outlook Database*, October 2014, www.imf.org (data dostępu: 07.11.2014).

Chiny zwiększają swoją przywódczą rolę wśród państw rozwijających się przede wszystkim w Azji, ale ich znaczenie zdecydowanie wykracza poza ten region; stały się ważnym graczem światowym, który konsekwentnie kreuje się na przewidywalnego i poważnego uczestnika światowej gospodarki, odpowiedzialnego za przyszłość stosunków międzynarodowych.

Fakt, że Chiny mają decydujący wpływ na kształt współczesnych globalnych stosunków gospodarczych i międzynarodowego podziału pracy, a znaczenie tego kraju w gospodarce światowej wzrasta, stał się przesłanką przygotowania niniejszego opracowania, którego celem jest ocenienie zagranicznej polityki gospodarczej ChRL oraz wskazanie konsekwencji tej polityki dla pozycji Chin na arenie międzynarodowej. W pracy przeprowadzono krytyczne studia literatury naukowej, a stawiane tezy poparto analizą danych empirycznych dotyczących lat 1949 – 2014.

Ewolucja i cele zagranicznej polityki gospodarczej Chin

Chiny zawdzięczają swoją obecną pozycję na arenie międzynarodowej wielu czynnikom. Bardzo ważną rolę odegrały osoby zarządzające krajem, kilku przywódców zasługuje na szczególną uwagę. Powstanie Chińskiej Republiki Ludowej zostało ogłoszone 1 października 1949 r. przez Mao Zedonga⁵, który po zdobyciu

⁵ Di H., *The Most Respected Enemy: Mao Zedong's Perception of the United States*, Cambridge University Press on behalf of the School of Oriental and African Studies, „The China Quarterly” nr 137 (marzec 1994), 144–158.

władzy zapoczątkował przebudowę systemu gospodarczego i społecznego Chin procesem kolektywizacji. Z kolei Deng Xiaoping to ojciec komunistycznego kapitalizmu w Państwie Środka, który przeprowadził szereg reform gospodarczych. Można byłoby wymienić jeszcze licznych przywódców; listę zamykałby obecny Przewodniczący Chińskiej Republiki Ludowej (od 2013 r.) – Xi Jinping (od 2012 r. sekretarz generalny KPCh).

Od początku istnienia ChRL priorytetowym celem polityki wewnętrznej i zagranicznej była obrona suwerenności oraz integralności terytorialnej kraju. W pierwszej dekadzie po powstaniu Chińskiej Republiki Ludowej polityka zagraniczna państwa koncentrowała się głównie na konsolidacji oraz współpracy w ramach bloku wschodniego. Najbardziej spektakularnym przejawem takiego kierunku w polityce było uczestnictwo chińskich wojsk w wojnie koreańskiej w latach 1950–1953. Zmiana nastawienia w chińskiej polityce zagranicznej nastąpiła jednak już pod koniec lat 50., wraz z narastaniem chińsko-radzieckiej rywalizacji o przewodnictwo wśród państw rozwijających się, a przede wszystkim wśród krajów komunistycznych⁶. Konflikt chińsko-radziecki doprowadził nawet do krwawych starć granicznych w 1969 r.

W 1954 r. Chiny i Indie ogłosiły pięć zasad stosunków międzynarodowych (zasady zostały przyjęte w 1955 r.)⁷:

1. wzajemne poszanowanie integralności terytorialnej i suwerenności,
2. wzajemna nieagresja,
3. wzajemna nieingerencja w sprawy wewnętrzne,
4. równość i wzajemne korzyści,
5. pokojowe współistnienie.

Zasady te są dowodem rosnących aspiracji ChRL do odgrywania wiodącej roli wśród państw rozwijających się, głównie w Azji i Afryce⁸. Zasady te do dziś pozostają podstawowymi zasadami polityki zagranicznej Państwa Środka.

Relacje między Chinami a Indiami jednak pogorszyły się i w 1962 r. oba kraje stoczyły miesięczną wojnę graniczną. Od tamtego momentu kraje te uważają się za głównych rywali na arenie regionalnej (Chiny zawiązały trwający nadal sojusz z Pakistanem przeciwko Indiom).

Od połowy lat 60. XX w. Chiny zaczęły otwierać się na stosunki dyplomatyczne z państwami zachodnimi. Proces ten został zapoczątkowany przez nawiązanie stosunków z Francją w 1964 r., a kulminacją stało się znormalizowanie relacji z USA (zapoczątkowane w 1971 r. formalnie, stosunki dyplomatyczne zostały

⁶ Pollack J.D., Salomon R.H., *The Sino-Soviet Conflict and American Security Concerns*, „The Rand Paper Series”, P-6288, 1979, s. 1–7.

⁷ Kalha R.S., *Panchsheel – The Five Principles of Peaceful Co-Existence*, Indian Council of World Affairs, New Delhi 25.07.2014, s. 2.

⁸ Chi-Kwan M., *Americ's response to the Chinese communist peaceful coexistence initiative, 1954–1957*, University of Hong Kong 1996.

nawiązane 1 stycznia 1979 r.)⁹. Istotne było również znormalizowanie w 1972 r. stosunków chińsko-japońskich¹⁰.

Koniec lat 70. to okres polityki reform i modernizacji kraju oraz stopniowego otwarcia gospodarki chińskiej na handel i inwestycje zagraniczne. Przejawem wzrostu roli oraz zaangażowania międzynarodowego Chin było obwieszczenie przez Deng Xiaopinga w 1974 r. teorii trzech światów (*three worlds theory*)¹¹. Zgodnie z tą teorią system międzynarodowy składa się z „trzech światów”:

1. rywalizujących ze sobą supermocarstw (USA i ZSRR),
2. państw rozwiniętych,
3. Trzeciego Świata (państw rozwijających się z różnych regionów świata).

Deng Xiaoping oświadczył, że Chiny należą do Trzeciego Świata, wykluczył dążenie kraju do bycia supermocarstwem i hegemonem. Takie pokojowe stanowisko, odrzucające czyjąkolwiek dominację na arenie międzynarodowej oraz stawiające Chiny w gronie krajów rozwijających się, nadal jest centralnym elementem współczesnej polityki zagranicznej ChRL, która w ostatnich latach była jednak wyraźnie asertywniejsza.

Przełomowym wydarzeniem w historii Chin było wprowadzenie w 1978 r. przez Deng Xiaopinga programu ambitnych reform gospodarczych¹². Zmiany polegały na liberalizacji wymiany na rynku wewnętrznym i otwarciu gospodarki dla podmiotów zagranicznych, reformie prawa i systemu finansowego, zmianie w strukturze własnościowej przedsiębiorstw oraz w systemie edukacji i opieki społecznej¹³. Reformy te przyczyniły się do otwarcia Chin i włączenia kraju w system gospodarki światowej.

Obserwując poczynania chińskich polityków, można dojść do wniosku, że Chiny nie zamierzają odgrywać na arenie międzynarodowej roli drugich Stanów Zjednoczonych. Chiny dbają przede wszystkim o własne interesy, a nie regionalne czy globalne. Kraj ten nie ma potrzeby podtrzymywania własnymi siłami międzynarodowego systemu, który został stworzony przez Amerykę, chociaż czerpie spore korzyści z jego istnienia.

⁹ *China – U.S. Relations*, Embassy of the People’s Republic of China in the United States of America, www.china-embassy.org/eng/zmgxs/ocusr/t946195.htm (data dostępu: 10.11.2014).

¹⁰ *Resumption of Sino-Japanese diplomatic relations*, Ministry of Foreign Affairs of the People’s Republic of China, www.fmprc.gov.cn/mfa_eng/ziliao_665539/3602_665543/3604_665547/t18010.shtml (data dostępu: 10.11.2014).

¹¹ Gillespie S., *Diplomacy on a south-south dimension: The legacy of Mao’s three-worlds theory and the evolution of Sino-African relations*, *Diplomacy on a South-South Dimension*, Intercultural Communication and Diplomacy, www.diplomacy.edu/sites/default/files/IC%20and%20Diplomacy%20%28FINAL%29_Part8.pdf, s. 123.

¹² Shirk S.L., *Competition for Power and Challenges of Reform in post-Deng China*, University of California, San Diego 1996, s. 1.

¹³ Gang F., Perkins D.H., Sabin L., *People’s Republic of China: Economic performance and prospects*, „Asian Development Review”, 15(2) 1997, s. 43–85.

Narzędzia realizacji zagranicznej polityki gospodarczej Chin

W literaturze przedmiotu można znaleźć podział instrumentów polityki zagranicznej na¹⁴: polityczne, ekonomiczne, wojskowe, psychospołeczne, normatywne i inne. Instrumenty polityczne nadal są istotne, jednak instrumenty gospodarcze w przypadku Chin, jako rosnącej potęgi gospodarczej, mają dominujące znaczenie¹⁵.

Wśród istotnych środków gospodarczych można wskazać politykę wspierania ekspansji zagranicznej chińskich firm (eksport, inwestycje zagraniczne). Eksport od lat pozostaje siłą napędzającą gospodarkę tego kraju. Istotnym czynnikiem przewagi konkurencyjnej chińskiego eksportu jest cena, będąca rezultatem zarówno charakterystyki samego Państwa Środka i dokonującej się w nim transformacji systemowej, jak i polityki ekonomicznej. Niskie ceny chińskiego eksportu są efektem polityki kursu walutowego¹⁶ oraz niewielkich kosztów pracy¹⁷. System stałego kursu walutowego sprzyja rozwojowi handlu Państwa Środka, ponieważ praktycznie eliminuje ryzyko kursu walutowego, a utrzymywanie niedowartościowania renminbi przez interwencje banku centralnego Chin (Ludowego Banku Chin) na rynku walutowym poprawia konkurencyjność cenową eksportu oraz prowadzi do akumulacji rezerw walutowych¹⁸. Interwencje banku centralnego na rynku walutowym powstrzymujące aprecjację renminbi mogą być wręcz utożsamiane z subsydiowaniem eksportu, a dynamiczny wzrost eksportu prowadzi do przyspieszenia wzrostu gospodarczego. Oparta na cenie przewaga konkurencyjna eksportu jest wspierana również przez inne dziedziny polityki gospodarczej Chin. Uwalniając ceny w ramach procesu transformacji, nie uwolniono cen surowców i czynników produkcji, więc ceny energii, paliw, wody, ziemi i niektórych surowców pozostają pod kontrolą państwa i są utrzymywane na niskim poziomie, co również może być traktowane jako forma wspierania eksportu. Do pośredniego subsydiowania eksportu można ponadto zaliczyć dostępność tanich kredytów udzielanych przez banki państwowe, które stanowią siłę dominująca w sektorze bankowym. Rozwojowi eksportu sprzyjają również luźna polityka ekologiczna oraz nieprzestrzeganie praw pracowniczych.

¹⁴ Halizak E., Kuźniar R., *Stosunki międzynarodowe: geneza, struktura, dynamika*, Warszawa 2006.

¹⁵ Wocheń K., *Ekspansja firm chińskich jako instrument realizacji polityki zagranicznej Państwa Środka. Rosnąca rola chińskich korporacji w wybranych regionach świata* [w:] Pietrasiak M., Kamiński T. (red), *China goes global. Rosnące znaczenie Chin na arenie międzynarodowej*, Łódź 2012, s. 32.

¹⁶ Rząd Chińskiej Republiki Ludowej prowadzi celową politykę niedowartościowania waluty krajowej – RNB (renminbi, potocznie yuan). Polityka kursu walutowego Chin odgrywa szczególną rolę w tworzeniu współczesnej globalnej nierównowagi płatniczej.

¹⁷ Augustyniak D., Piekarska A., *Chińska polityka kursowa a problem globalnej nierównowagi finansowej* [w:] Pietrasiak M., Kamiński T. (red), *China goes global. Rosnące znaczenie Chin na arenie międzynarodowej*, Łódź 2012, s. 21.

¹⁸ Skopiec D.A., *Polityka kursu walutowego Chin jako czynnik globalnej nierównowagi płatniczej*, Oficyna Wydawnicza, Szkoła Główna Handlowa w Warszawie, Warszawa 2013, s. 139–244.

Chiny prowadzą ekspansję zagraniczną, budując sieć korporacyjnych i inwestycyjnych powiązań, których siła jest istotnie większa niż siła powiązań politycznych. Rozwój Chin odbywa się we wszystkich sektorach gospodarki, na wszystkich szerokościach geograficznych, a realizowany jest przez miliony chińskich firm, a nie polityczne sojusze Państwa Środka¹⁹.

Nie ulega jednak wątpliwości, że Chiny są również siłą militarną. W wydanym przez Pentagon w 2006 r. *Quadrennial Defense Review Report*²⁰ znalazło się stwierdzenie, że to właśnie Chiny są państwem o największym potencjale, jeśli chodzi o konkurowanie z USA w dziedzinie militarnej.

Chiny wykorzystują również instrumenty psychospołeczne, takie jak promocja kultury oraz nauki. Narzędzia te służą budowaniu prestiżu i kształtowaniu korzystnego wizerunku państwa na scenie międzynarodowej. Dzięki takim działaniom Chiny dążą do zjednania sobie innych społeczeństw oraz tworzenia warunków umożliwiających wywieranie wpływu politycznego²¹.

Uczestnictwo Chin w międzynarodowych organizacjach gospodarczych jako element realizacji polityki zagranicznej

Postępujące od lat 70. otwarcie Chin włączyło ten kraj w system gospodarki światowej. W październiku 1971 r. Chińska Republika Ludowa została przyjęta do ONZ (zamiast Republiki Chińskiej na Tajwanie²²), zajmując tym samym stałe miejsce w Radzie Bezpieczeństwa ONZ, i szybko zaczęła zyskiwać coraz powszechniejsze uznanie międzynarodowe. Od 1980 r. ChRL ma swoich przedstawicieli w Banku Światowym²³ i Międzynarodowym Funduszu Walutowym (IMF)²⁴. Przystąpienie do Światowej Organizacji Handlu (WTO) w grudniu 2001 r.²⁵ przyspieszyło integrację z gospodarką światową. Chiny zawierają ponadto liczne porozumienia i umowy o współpracy gospodarczej z poszczególnymi krajami oraz ugrupowaniami gospodarczymi. W 1997 r. ChRL rozpoczęła dialog ze Stowarzyszeniem Państw Azji Południowo-Wschodniej (ASEAN), a 2004 r. podpisała porozumienie w sprawie utworzenia do 2015 r. największej na świecie

¹⁹ Wocheń K., op.cit., s. 32.

²⁰ *Quadrennial Defense Review Report*, Department of Defense, Pentagon, Washington DC, 06.02.2006, www.defense.gov/qdr/report/report20060203.pdf (data dostępu: 10.11.2014).

²¹ Wocheń K., op.cit., s. 32–33.

²² Tieh S., *China in the UN: United with Other Nations?*, „Stanford Journal of Asian Affairs” 4(1) 2004, s. 19–28.

²³ www.worldbank.org/en/country/china (data dostępu: 10.11.2014).

²⁴ Chiny są członkiem IMF od 27.12.1945 r. (www.imf.org/external/np/sec/memdir/memdate.htm).

²⁵ www.wto.org/english/thewto_e/countries_e/china_e.htm.

strefy wolnego handlu. Chiny są również członkami APEC (*Asia-Pacific Economic Cooperation*)²⁶ i liberalizują swoją wymianę handlową.

ChRL, Brazylia, Indie i Rosja, jako państwa rozwijające się, z największym potencjałem, zawiązały ugrupowanie BRIC²⁷ (pierwszy szczyt przywódców zorganizowano w czerwcu 2009 r.). Chiny stały się ponadto wiodącym członkiem Grupy G-20, która od końca 2008 r. zaczęła uzyskiwać decydujący głos w sprawach światowej gospodarki.

Wzrost powiązań z gospodarką światową znalazł odzwierciedlenie w rosnącej pozycji Chin na arenie międzynarodowej. Z zamkniętego, mało znaczącego i zacofanego gospodarczo kraju przekształciły się w lidera gospodarki azjatyckiej, a następnie – światowej²⁸.

Rosnący potencjał gospodarczy Chin jako efekt skutecznej polityki Chin

W 1980 r. Chiny były dziesiątym co do wielkości krajem na świecie (wg PKB PPP). Już 10 lat później Chiny były piątką gospodarką na świecie, a w 1991 r. wyprzedziły Francję, zajmując czwarte miejsce. W 1994 r. wyprzedziły Niemcy, stając się trzecią gospodarką, a w 1999 r. – Japonię i od tego roku zajmują drugie miejsce. Prognozy MFW wskazują, że w 2014 r. PKB Chin będzie wyższe niż Stanów Zjednoczonych, a udział Chin w światowym PKB w 2019 r. wzrośnie do 18,73% (tab. 1).

Tabela 1. Największe gospodarki na świecie wg PKB PPP w latach 1980–2019

	1980	1991	1994	1999	2013	2014	2019
1	USA 22,37%	USA 22,03%	USA 20,84%	USA 21,33%	USA 16,45%	Chiny 16,48%	Chiny 18,73%
2	Japonia 7,79%	Japonia 8,99%	Japonia 7,82%	Chiny 7,19%	Chiny 15,84%	USA 16,28%	USA 15,44%
3	Niemcy 6,54%	Niemcy 6,12%	Chiny 5,53%	Japonia 6,83%	Indie 6,65%	Indie 6,80%	Indie 7,70%

²⁶ Chiny przystąpiły do APEC 12–14 listopada 1991 r. (www.apec.org/About-Us/About-APEC/Member-Economies.aspx).

²⁷ Określenie BRIC zostało po raz pierwszy użyte przez Jima O’Neilla w publikacji *Building Better Economic BRICs* opublikowanej w listopadzie 2001 r., a następnie rozpowszechnione w 2003 r., dzięki ogłoszonej przez Goldman Sachs prognozie, z której wynikało, że do połowy XXI w. kraje te będą potęgami światowymi. Po raz pierwszy jako BRIC państwa te spotkały się na szczepku ministerstw spraw zagranicznych podczas Zgromadzenia Ogólnego Narodów Zjednoczonych w Nowym Jorku w 2006 r. W 2011 r. BRIC zostało rozszerzone o Republikę Południowej Afryki (BRICS). Kraje BRICS nie tworzą sojuszu politycznego ani formalnego stowarzyszenia handlu (www.brics5.co.za/about-brics).

²⁸ Białowas T., *Dynamika i wzrost znaczenia Chin w gospodarce światowej* [w:] B. Mucha-Leszko (red.), *Współczesna gospodarka światowa – główne centra gospodarcze*, UMCS, Lublin 2005, s. 301–319.

	1980	1991	1994	1999	2013	2014	2019
4	Francja 4,52%	Chiny 4,39%	Niemcy 5,39%	Niemcy 4,89%	Japonia 4,58%	Japonia 4,48%	Japonia 3,85%
5	Włochy 4,46%	Francja 4,15%	Indie 3,82%	Indie 4,46%	Niemcy 3,45%	Niemcy 3,39%	Niemcy 3,00%
6	Brazylia 4,33%	Włochy 4,07%	Francja 3,66%	Francja 3,49%	Rosja 3,43%	Rosja 3,33%	Rosja 2,96%
7	W. Bryt. 3,39%	Indie 3,79%	Włochy 3,56%	Włochy 3,26%	Brazylia 2,96%	Brazylia 2,87%	Brazylia 2,67%
8	Indie 3,04%	Brazylia 3,62%	Brazylia 3,39%	Brazylia 3,15%	Francja 2,49%	Francja 2,42%	Indonezja 2,61%
9	Meksyk 3,04%	W. Bryt. 3,22%	W. Bryt. 3,03%	W. Bryt. 3,03%	Indonezja 2,34%	Indonezja 2,39%	Francja 2,16%
10	Chiny 2,33%	Meksyk 2,71%	Meksyk 2,58%	Meksyk 2,48%	W. Bryt. 2,28%	W. Bryt. 2,28%	W. Bryt. 2,12%

Prognoza dla lat 2014–2019.

Źródło: International Monetary Fund, *World Economic Outlook Database*, October 2014, www.imf.org [data dostępu: 07.11.2014].

Duże tempo wzrostu gospodarczego w Chinach jest efektem kilku czynników: wysokiego poziomu inwestycji i oszczędności, postępu technicznego i zmian technologicznych w produkcji ponoszących wydajność przemysłu, wysokiego poziomu popytu wewnętrznego i zagranicznego oraz dynamicznego rozwoju handlu zagranicznego i zagranicznych inwestycji bezpośrednich.

Istotnym powodem wzrostu gospodarczego Chin jest bardzo wysoka akumulacja kapitału. Stopa inwestycji (stosunek inwestycji do PKB) w Chinach wynosiła w 2013 r. 48%. W porównaniu z innymi gospodarkami jest to wysoka wartość; np. w USA inwestycje stanowiły 19% PKB²⁹. W tabeli 2 zaprezentowano najważniejsze wskaźniki kondycji gospodarki Chin i Stanów Zjednoczonych.

Tabela 2. Wybrane wskaźniki kondycji gospodarki Chin i Stanów Zjednoczonych w latach 1980–2013

Wskaźniki	1980– –1985	1985– –1992	1993– –2001	2002– –2013	2012	2013
Chiny						
PKB (ceny bieżące; mld USD)	304,13	393,25	945,98	4534,10	8386,68	9469,12
Dynamika PKB (ceny stałe; %)	10,30	9,56	9,94	10,11	7,65	7,70
Stopa bezrobocia (%)	2,98	2,19	3,03	4,14	4,10	4,10
Eksport towarów (dynamika; %)	b.d.	b.d.	14,87	16,13	6,83	9,61

²⁹ International Monetary Fund, *World Economic Outlook Database*, październik 2014, www.imf.org (data dostępu: 07.11.2014).

Wskaźniki	1980– –1985	1985– –1992	1993– –2001	2002– –2013	2012	2013
Import towarów (dynamika; %)	b.d.	b.d.	17,13	14,44	7,21	9,26
Bilans obrotów iejących (mld USD)	b.d.	b.d.	26,16	191,73	215,39	182,81
Bilans obrotów biejących (% PKB)	b.d.	b.d.	2,41	4,76	2,57	1,93
Inflacja (CPI; %)	b.d.	41,42	75,07	94,42	108,19	111,03
Inwestycje (% PKB)	34,07	36,46	38,11	44,12	47,75	47,79
Oszczędności narodo- we brutto (% PKB)	33,71	36,41	39,50	48,88	50,32	49,72
Stany Zjednoczone						
PKB (ceny bieżące; mld USD)	3574,00	5426,29	8690,73	14 061,76	16 163,15	16 768,05
Dynamika PKB (ceny stałe; %)	2,76	3,06	3,55	1,81	2,32	2,22
Stopa bezrobocia (%)	8,13	6,38	5,15	6,72	8,08	7,35
Eksport towarów (dynamika; %)	1,76	9,14	6,46	4,39	3,65	2,83
Import towarów (dynamika; %)	6,03	5,29	10,08	3,21	2,12	0,93
Bilans obrotów biejących (mld USD)	–41,56	–96,79	–211,35	–559,64	–460,75	–400,26
Bilans obrotów biejących (% PKB)	–1,01	–1,92	–2,30	–4,07	–2,85	–2,39
Inflacja (CPI; %)	96,83	122,53	160,14	207,69	229,60	232,96
Stopa procentowa (LIBOR 6-mies.; %)	12,37	7,32	5,28	2,12	0,69	0,41
Inwestycje (% PKB)	23,50	22,27	22,06	20,70	19,17	19,35
Oszczędności narodo- we brutto (% PKB)	21,50	19,26	19,52	16,75	16,32	16,96

Źródło: opracowanie własne na podstawie International Monetary Fund, *World Economic Outlook Database*, October 2014, www.imf.org [data dostępu: 07.11.2014].

Kolejnym źródłem tak szybkiego rozwoju gospodarczego Chin jest postęp techniczny. Strategia chińskiego rządu polega na zachęcaniu zagranicznych przedsiębiorstw do podejmowania produkcji w Chinach i wspieraniu wspólnych przedsięwzięć (*joint venture*). Umożliwienie chińskim przedsiębiorstwom takiej współpracy pozwala na uczenie się od zagranicznych partnerów oraz na poprawę produktywności.

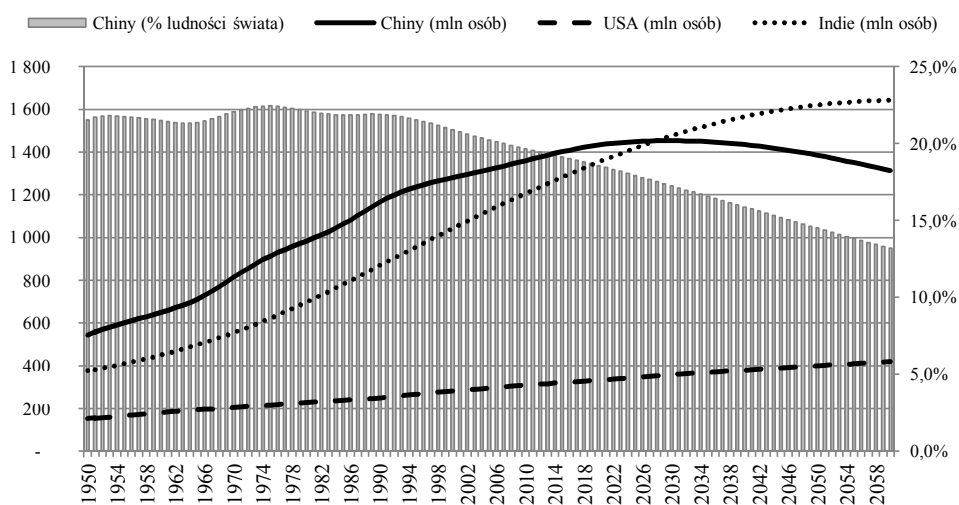
Ponadto udział Chin w światowej produkcji i wydobywaniu surowców w wielu dziedzinach przekracza 1/3 produkcji świata. Gospodarka chińska staje się też coraz bardziej otwarta, co przyczynia się do wzrostu udziału w handlu światowym i prze-

plywach kapitału. Na podstawie wskazanych faktów można stwierdzić, że Chiny stają się coraz ważniejszym podmiotem gospodarki światowej.

Mimo że Chiny odniosły wielki sukces gospodarczy, nadal są biednym krajem z wieloma problemami wewnętrznymi. Poziom życia w Chinach jest kilkakrotnie niższy niż w krajach europejskich czy USA. W celu ograniczenia negatywnych skutków szybko rosnącej liczby ludności Chin w 1977 r. została wprowadzona polityka kontroli populacji, czyli „polityka jednego dziecka”. Polityka ta prowadzi do ograniczania liczby ludności, ale Chiny nadal są najludniejszym krajem na świecie³⁰.

W 2013 r. liczba ludności na świecie wynosiła 7,244 mld, z czego ludność Chin – 1,394 mld (19,2%)³¹. Prognozy OECD wskazują, że do 2060 r. udział ludności Chin zmniejszy się do 1,313 mld (13,2% ludności świata). Zdecydowanie wyższy będzie udział mieszkańców Indii (16,5%)³².

Wykres 2. Liczba ludności Chin, USA i Indii w latach 1950–2060



Źródło: OECD, *OECD.StatExtracts*, Database (data dostępu: 08.11.2014).

W celu poprawienia warunków życia mieszkańców Chin wprowadzane są liczne reformy. Przykładem może być reforma meldunkowa³³, dzięki której ma zniknąć rozróżnienie na posiadaczy meldunków wiejskich i miejskich³⁴. Chiny

³⁰ W ostatnich latach nastąpiło złagodzenie polityki jednego dziecka w Chinach.

³¹ Ludność Chin stanowiła największy odsetek ludności świata w latach 1973–1977 (22,4%). OECD, *OECD.StatExtracts*, Database (data dostępu: 08.11.2014).

³² Według szacunków w 2028 r. liczba ludność Indii przewyższy liczbę ludności Chin.

³³ www.obserwatorfinansowy.pl/forma/rotator/chiny-obywatel-ze-wsi-obywatelem-i-kategorii (data dostępu: 10.11.2014).

³⁴ Osoby zameldowane na wsi były pozbawione możliwości korzystania z lepszych szkół, ochrony zdrowia, ubezpieczeń społecznych, legalnego zatrudnienia w miastach czy nawet możliwości kupna mieszkania.

rozpoczęły również reformy przedsiębiorstw państwowych³⁵. Plan reform został ogłoszony przez Xi Jinpinga w listopadzie 2013 r. Panowało przekonanie, że grupy interesu, czyli same przedsiębiorstwa państwowe, będą utrudniać reformy, jednak Xi Jinping działa zdecydowanie i widoczne są już pierwsze efekty. Według analityków o wiele lepsze byłyby odważniejsze eksperymenty z prywatyzacją, ale realia polityczne są takie, że władze państwowe chcą utrzymać kontrolę nad bankami, kolejami i innymi dziedzinami życia. Te ograniczenia nie dławiają jednak wszystkich inwestycji³⁶.

Zakończenie

Chińska Republika Ludowa jest jednym z krajów, które przestawiły gospodarkę z centralnie planowanej na rynkową. Nielicznym jednak krajom udało się osiągnąć taki sukces jak Chinom. W większości krajów, które przeszły transformację, na przykład w Rosji i krajach Europy Środkowej, przemianom ustrojowym towarzyszyła recesja gospodarcza, a tempo wzrostu przeważnie jest znacznie wolniejsze niż w przypadku Chin.

Ekonomiści nie są pewni, dlaczego to właśnie Chinom się udało. Niektórzy wskazują jako przyczynę wolniejsze tempo transformacji³⁷. Inni upatrują przyczyn w pozostaniu przy władzy partii komunistycznej – silny rząd umożliwił lepszą ochronę praw własności, stwarzając firmom zagranicznym zachętę do inwestowania³⁸.

Chiny są najludniejszym rozwijającym się krajem na świecie, który – aby kontynuować ten proces – będzie coraz bardziej wzmocniać współpracę ze wszystkimi państwami i regionami, niezależnie od ich lokalizacji, ustroju politycznego i uwarunkowań historycznych³⁹. W chińskiej polityce widoczne jest dążenie do zbalansowania dbałości o własne interesy narodowe i konieczności angażowania się w rozwiązywanie globalnych problemów, np. skutków ocieplenia klimatu czy globalnej nierównowagi płatniczej.

Chińska polityka zagraniczna realizowana jest za pomocą pieniędzy, nie broni, a jej realizatorami są chińskie firmy⁴⁰. Polityka zagraniczna Chin, której narzędziem są dziś chińskie firmy, jest szczególnie złożonym zagadnieniem również dlatego, że realizowana jest skutecznie. Ze względu na duże środki finansowe chińskich funduszy inwestycyjnych, państwowe wsparcie chińskich firm państwowych (SOE) oraz politykę zachęcania do inwestycji za granicą chiński kapitał prawdopodobnie będzie odgrywać w przyszłości coraz większą rolę⁴¹.

³⁵ www.obserwatorfinansowy.pl/tematyka/makroekonomia/chiny-znow-reformuja-panstwowe-firmy.

³⁶ Ibidem.

³⁷ Pierwsze chińskie reformy nastąpiły w rolnictwie w 1980 r., a nawet dziś współwłaścicielem wielu przedsiębiorstw jest państwo.

³⁸ Blanchard O., *Makroekonomia*, Warszawa 2011, s. 16–17.

³⁹ Wocheń K., op.cit., s. 31.

⁴⁰ Wocheń K., op.cit., s. 46.

⁴¹ Wocheń K., op.cit., s. 47.

W ciągu 65 lat od powstania ChRL został ukształtowany specyficzny styl chińskiej polityki zagranicznej. Chiny stoją przed szansami, ale również licznymi wyzwaniami i zagrożeniami, powinny zatem dołożyć szczególnych starań, jeśli chodzi o bezpieczeństwo i rozwiązywanie problemów. Chińczycy powinni nadal uczyć się teorii Deng Xiaopinga w dziedzinie spraw zagranicznych i pod kierownictwem rządu na czele z Xi Jinpingiem uprawiać niezależną pokojową politykę zagraniczną.

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Streszczenie

Celem artykułu jest ocenie zagranicznej polityki gospodarczej ChRL oraz wskazanie konsekwencji tej polityki dla pozycji Chin na arenie międzynarodowej. W opracowaniu przedstawiono cechy, cele, kierunki i narzędzia polityki zagranicznej, ze szczególnym uwzględnieniem aspektów ekonomicznych. Najważniejszy wniosek z przeprowadzonej analizy to stwierdzenie, że w ciągu 65 lat od powstania ChRL powstał specyficzny styl chińskiej polityki zagranicznej, która realizowana jest za pomocą pieniędzy, a nie broni. Chiny doświadczyły istotnego awansu gospodarczego i społecznego, jednak nadal stoją przed szansami, ale też licznymi wyzwaniami i zagrożeniami.

Słowa kluczowe: Chińska Republika Ludowa, polityka zagraniczna, polityka gospodarcza

Summary

From Mao Zedong to Xi Jinping. The foreign economic policy of the PRC – characteristics, objectives, directions and tools

The aim of the paper is to evaluate the People's Republic of China's (PRC) foreign economic policy and to indicate the consequences of that policy for China's position on the international scene. The paper presents the characteristics, objectives, directions and tools of its foreign policy, with special emphasis on economic aspects. The most important conclusion from the analysis is that in the last 65 years, since the establishment of the PRC, a unique style of Chinese foreign policy was formed, which is based on money, not arms. China has experienced significant economic and social development, but is still facing opportunities as well as challenges and threats.

Keywords: People's Republic of China, foreign policy, economic policy

JEL: F50, N15, P20

Risks of investment in personnel development: evidence from Ukrainian IT companies

Oksana Domkina*

Introduction

In recent decades, the information technologies (IT) sector grew dramatically. Nowadays, IT is integrated with almost every part of life, and it is apparent that this tendency will continue in the future. This trend explains the high level of demand for IT specialists globally. According to modern economic theory, human capital has become one of the main production factors and the most promising direction of investment, as such investment creates an opportunity to obtain high and long-term economic and social effects. According to the Innovation Economy Global Outlook conducted by Silicon Valley Bank in 2014 (see Report), regions that build talent pools populated by motivated workers with relevant skills have the chance to become a destination of choice for rapidly growing companies and to provide their citizens with high quality, well-paid jobs.

The IT sector is representative of this new economy that is most dependent on human capital as the main competitive factor. So, the question for this sector is not whether investment in the development of personnel should be made, but what the most effective ways of performing it are and who has to pay for the education: the worker, the company or the government. Undoubtedly, every link in this human capital production chain plays its own very important role and a consolidated effort will lead to the best results. However, in this paper we aim to concentrate on the micro level and study a firm as a contributor to human capital enrichment. The development of personnel requires investment, the results of which are unpredictable due to many internal and external factors. Thus, investment in the human capital of a firm is associated with risks. The necessity to find a balance between potential gains, benefits and risks on the one hand, and to build a complex method for risk estimation on the other, explains the timeliness of this research.

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Review of related studies

There are many scientific works exploring the concept and role of human capital, starting with Smith (1771), the first classical economist, who included this kind of capital in his definition of capital. Further, such well-known economists as Mincer (1954), Becker (1964), and Schultz (1981) contributed significantly to the study of investment in human capital. Barro (1991), Riddell (2006), and Hanushek (2012) explored the economic effect of education. Grishnova (2002), Oluwatobi (2011), Ogunrinola (2012), Sarra, Benabou and Tabeti (2013) studied the role of government in human capital development. And such economists as Dobrynin, Dyatlov and Tsyrenova (1999), Christiansen, Joensen and Nielsen (2006), Zaklekta-Berestovenko (2008), and Koerselman and Uusitalo (2013) examined the ROI of investment in human capital. In addition, there are a lot of studies regarding the development and training of personnel, its positive and negative aspects, and its effect on the firm's performance: Aragón, Jiménez and Valle (2013), Aguinis and Kraiger (2009), Wall and Wood (2005), and Collins and Clark (2003). Fitz-enz, who is considered to be the father of human capital benchmarking and performance assessment with his book „The ROI of human capital” (2009), provided a methodology for measuring the bottom-line effect of employee performance. In recent years, Zakharova contributed significantly to the topic of evaluating the factor of risk that occurs if a firm invests in the development of its personnel in her monograph „Management of investment in human capital: methodology, estimation, planning” (see Zakharova 2010). On the other hand, there is a lot of scientific research related to risk estimation in general terms, namely in the field of investment risk assessment. The fundamentals of investment were described by Sharp (2003) and Blank (2000). Vitlinskiy (2000) and Kaminskiy (2002) examined and explored general risk determination and econometric approaches to its evaluation in great detail. Nevertheless, there is still a gap in the theory and its application for the determination, classification and estimation of risks of investment in human capital of a firm in general terms and especially related to human capital in the IT sector.

Risks of investment in the development of IT personnel

Nowadays, occupations in science and engineering are at the leading edge of economic competitiveness in an increasingly globalized world, and science and engineering human capital of sufficient size and quality is essential for any 21st century economy to prosper.

According to „Exploring Ukraine: IT Outsourcing Industry 2012” (see Report), during the last decade Ukraine has been the leading provider of software development and IT outsourcing services in the Central and Eastern European

region (excluding Russia). Ukraine is ranked first in the volume of IT outsourcing and software development services provided, in the number of IT specialists working in the industry, and in the number of IT graduates. Moreover, the level of technical education in Ukraine remains high, and according to the „Human Capital Report 2013”, Ukraine was ranked 24th out of 122 countries in the category of quality of math and science education.

Highly qualified personnel are at the core of the software development business. The presence of educational institutions for IT personnel training and education plays a very important role in the industry’s development. The question is how to develop highly-demanded IT workers while handling the possible risks.

There are different approaches to investment strategies of the development of employees (see Zaklekta 2008), and they are applicable to the IT sector: the development of the core management team only, the development of all employees, hiring already trained workers, on-the-job training, and on-demand ad hoc development. Any development investment strategy is used by a firm in accordance to its goals, strategy, economic sector, the line of business, and development approach.

In this research, we consider that a company invests in its human capital and assume that a selected strategy will lead to risks. We define risks of investment in the development of the personnel of a company (RIDPC) as both an objective and a subjective category of the firm’s activity which constitutes the probability of receiving additional competitive benefits and economic gain, as well as the likelihood of partial or complete loss of invested resources, depending on how effective the company’s management of the factors of uncertainty is. We adhere to the positive approach to the phenomenon of risk, which emphasizes the opposite side of risk – the potential success of entrepreneurial activity as a result of effective human resource and firm management and favorable external conditions. The sources for the transition from threats to opportunities in this direction comprise new methods and approaches to management, an effective training and development policy, improvement in the corporate culture, deep and considerate market analysis and adequate planning according to the results of the analysis.

In the framework of the general economic theory, investment in the development of the personnel of a firm is the process of improving employees’ knowledge and skills realized in adapting to the job, professional learning, training, work assessment, and career planning.

The main features of RIDPC in the IT sphere are the following:

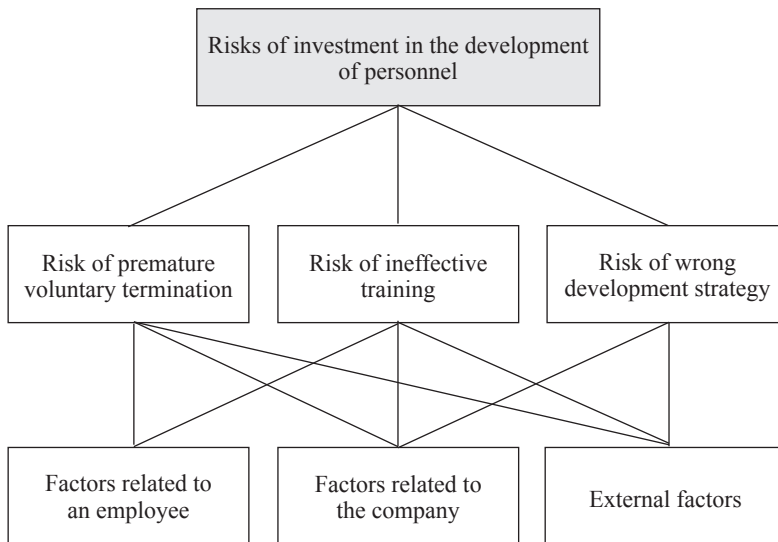
1. The highest weight of human factor in this kind of risk significantly complicates the process of analysis and quantitative estimation and, accordingly, this kind of risk will always have the highest level of uncertainty. Among other kinds of risk, these risks are much more characterized by the features of conflict, which results in uncertainty.
2. In the knowledge-based economy, and the IT sphere in particular, human capital becomes the most important means of production, thus the analysis of the risks of investment in its development increases in significance.

3. Globalization of IT labor markets increases the level of RIDPC because global companies have access to the most talented and trained workers in any part of the world, while for the local companies the labor market becomes more competitive.
4. Currently, the RIDPCs are not researched enough, companies do not have a robust methodology for analyzing them, and there is a lack of skilled analysts in this area.

In particular, in analyzing RIDPCs, we singled out three main categories of factors that influence them (Fig. 1):

1. related to an employee,
2. related to a company,
3. external factors.

Figure 1. Risks of investment in the development of personnel and factors that influence them



Source: own elaboration.

Moreover, there are three main RIDPCs:

1. Risk of premature voluntary termination – a risk that an employee trained by the company will leave it before the invested resources are recovered.
2. Risk of ineffective training – a risk that the personnel of a company will not achieve the target results of training. Typically, the reason, in such a case, is an insufficient level of learning skills, competencies and motivation of employees, although it can also be caused by poor HR training or external provider performance.
3. The risk of the wrong development strategy – a risk that the company will choose an inappropriate employee development plan which will

have only a short-term effect or will not give competitive advantages. We consider two factors that influence this kind of risk: 1) consistency in the company's general strategy and HR policy – the development program should comply with the general goal and strategy that the company has; 2) correspondence of the personnel development plan to the employees' real needs based on the results of their assessment.

The model

In this research, we will focus on the risks from the perspective of the factors that are the source of those risks: originating from the personnel, from the company or from the external environment. The basic formula of the estimation of risks of the investment in human capital of a company is as follows:

$$R = Q_1R_1 + Q_2R_2 + Q_3R_3 \quad (1)$$

where R is the value of the general risk of investment results.

R_1 (risk caused by the employee) – the likelihood that employee behavior will lead to negative results of investment or the employee will leave the firm before the resources invested in him/her will be recovered.

R_2 (risk caused by the company) – the likelihood that a company will not perform optimally in the area of employee development: training programs will not be selected according to real needs of employees and firm strategy; hired employees will not suit perfectly the respective positions and share the firm's values; external training providers and products selected by the HR division will not be reliable or qualitative enough.

R_3 (risk caused by external conditions) – the likelihood that the economic situation, labor market conditions, and competitors' actions will influence negatively the investment results.

Q_1, Q_2, Q_3 – the respective weights of each group of risks calculated as a result of pairwise comparisons.

It should be emphasized that each highlighted factor and sub-factor that can influence the investment results has to be evaluated in view of the possibility to have a negative impact, i.e. lead to an undesired outcome. Avoiding inconsistency in the evaluation of „positive” and „negative” factors is a necessary condition of receiving the correct index. For example, when evaluating competencies we will generally assign minimum risk to the employee who has the highest level of competencies and maximum to the one whose competencies are lowest compared to the others.

Risks related to the employee

This is the main group of risks associated with the greatest unpredictability. In the previous section, we described the factors that influence this kind of risk. In this section, we will estimate the respective weights of each factor and focus on the possible outcomes related to employee behavior. To evaluate R_j , we use the following formula:

$$R_1 = W_1X_1 + W_2X_2 + W_3X_3 + W_4X_4 \quad (2)$$

where W_1, W_2, W_3, W_4 are the respective weights of each kind of risk calculated as a result of pairwise comparisons.

X_j – investment results can be influenced by the motivation of the employee. X_j is determined by a number of sub-factors that can be represented with the next formula:

$$X_1 = w_{11}A_1 + w_{12}A_2 + \dots + w_{1m}A_m \quad (3)$$

where A_m – sub-factors (variables) used in calculating the risk of type X_j , and w_{1m} – coefficients of weight (importance) of these sub-factors that are calculated after pairwise comparison, $m = 1,5$.

The A_m variables are likelihoods that the motivation of an employee can be influenced by the following sub-factors:

A_1 – wages,

A_2 – additional benefits,

A_3 – career opportunities,

A_4 – interestingness of the work and engagement level,

A_5 – corporate culture strength.

X_2 – investment results can be influenced by the performance of an employee. X_2 is determined by three main sub-factors that can be represented with the formula:

$$X_2 = w_{21}B_1 + w_{22}B_2 + w_{23}B_3 \quad (4)$$

where B_m – sub-factors (variables) used in calculating the risk of type X_2 , w_{2m} – coefficients of weight (importance) of these sub-factors that are received after pairwise comparison, $m = 1,3$. The B_m variables are the likelihoods that results of investment in the development of an employee can be influenced by the following sub-factors:

B_1 – achievements,

B_2 – work commitment,

B_3 – time with the company.

X_3 – investment results can be influenced by the level of employee's competencies. Probability X_3 consists of four main competencies that are represented with the formula:

$$X_3 = w_{31}C_1 + w_{32}C_2 + \dots + w_{3m}C_m \quad (5)$$

where C_m – sub-factors (variables) used in calculating the risk of type X_3 , and w_{3m} – coefficients of weight (importance) of these sub-factors that are calculated after pairwise comparison, $m = 1,4$. The C_m variables are likelihoods that results of investment in the development of an employee can be influenced by the following competencies:

C_1 – achievement orientation,

C_2 – customer orientation,

C_3 – learning skills,

C_4 – teamwork and cooperation.

X_4 – investment results can be influenced by personal reasons of an employee.

Risks related to the company

To evaluate P_2 we use the following formula:

$$P_2 = S_1Y_1 + S_2Y_2 + S_3Y_3 + S_4Y_4 + S_5Y_5 + S_6Y_6 + S_7Y_7 \quad (6)$$

where:

Y_1 – factor of staff development plan,

Y_2 – consistency of strategies,

Y_3 – salary,

Y_4 – corporate culture,

Y_5 – interesting work and projects,

Y_6 – team,

Y_7 – career opportunities.

S_1, \dots, S_n – coefficients of weight (importance) of these factors, $n = 1,7$.

Risks related to external changes

Risks related to the macroeconomic situation and labor market conditions are defined as external factors in the „firm-employee” relationship. Some of them are the same for the whole sector or economy. In the framework of our research, to estimate P_3 , we will focus on the following factors:

$$P_3 = T_1Z_1 + T_2Z_2 + T_3Z_3 + T_4Z_4 + T_5Z_5 + T_6Z_6 \quad (7)$$

where:

Z_1 – economic and political situation,

Z_2 – labor market situation,

Z_3 – competitors’ actions,

Z_4 – training market situation,

Z_5 – political changes,

Z_6 – technological changes.

T_1, T_2, \dots, T_n – coefficients of weight (importance) of these factors, $n = 1, 6$.

The problem

One of the distinctive features of the investment in human capital of a company is that, unlike the human capital of a country, for which almost every kind of investment brings a generally positive effect, the benefits for the company are determined by its relative utility in limited economic spheres, as well as by the possibility of employees’ movement in the labor market (see Grishnova 2002).

The main problem and difficulty with the quantitative estimation of RIDPC and its forecasting is the human factor. Human behavior is often unpredictable and complex, so it requires specific approaches and methods of assessment. The main features of human behavior are the following (see Zakharova 2010):

1. Impossibility to measure exactly the intellectual abilities and the level of motivation for an individual’s personal professional development at the pre-investment stage.
2. Different speed, learning abilities, and work performance of employees that depend on intellectual potential, the individual proportion of motivation factors, labor behavior, and opportunities to enrich the received knowledge at the workplace.
3. Instability of the physiological and emotional condition of an individual, changing personal reasons, goals, aspirations, values, abilities to learn, and career expectations.

4. Individual sensitivity to organization's corporate culture and social atmosphere, which influences the productivity of an employee.
5. Different ROI of development depending on the stage in the life cycle of an individual employee.
6. Individual health conditions and physical abilities.

There are a number of classic methods of estimating the effectiveness of investment and risk. According to classic investment management theory, the standard approach to determine whether an investment project is profitable is to calculate the return on investment (*ROI*). This indicator shows the ratio between profit and loss. So, if the $ROI > 1$ the project is profitable, and if the $ROI < 1$ the expected losses are higher than the gains. The *ROI* for human capital can be calculated using the following formula (Fitz-enz 2000):

$$HC ROI = \frac{Revenue - (Expences - [Pay + Benefits])}{Pay + Benefits} \quad (8)$$

However, a risk-based evaluation can be considered a complementary alternative to an *ROI*-based one, as in some situations (like assessing a single employee) it is not feasible to calculate the revenue associated with a particular investment while risks can generally be estimated more easily (because the estimation may be performed indirectly).

Based on real options theory, Bhattacharya and Wright (2000) conceptualize the following types of risks and uncertainties associated with the management of HC: uncertainties of returns or performance, uncertainties of volume, and uncertainties of costs and combinations.

If we consider investment in the development of personnel as a business model it can be described as the function of income I that depends on endogenous and exogenous variables:

$$I = f(x_1, x_2, \dots, x_p, y_1, y_2, \dots, y_p) \quad (9)$$

where I – income of a firm, $x_p, i = 1, p$ are endogenous variables, including expenses on personnel development, and $y_p, j = 1, q$ – exogenous variables that are out of the firm's control.

If we approach investment in the development of personnel as a real investment project it is worth considering the methods of investment project estimation such as *NPV* (net present value), *PI* (profitability index), *IRR* (internal rate of return), *DPP* (Discounted Playback Period), *MIRR* (Modified Internal Rate of Return), *PP* (Payback Period), and *GPV* (Gross Present Value). Also, a number of capital investment decision methods can take risks into account, but each of them focuses on different factors and has its limitations, especially if we deal with the human factor of uncertainty. Ye and Tiong (2000) suggested using the net-present-

-value-at-risk (*NPV-at-risk*) method that combines the weighted average cost of capital and dual risk-return methods. The evaluation of two hypothetical power projects shows that the *NPV-at-risk* method can provide a better framework for risk evaluation of the investment. Serguievaa and Hunterb (2004) suggested a fuzzy criterion, and subsequently derived a measure of the risk associated with each investment opportunity and an estimate of the projects' robustness towards market uncertainty. An alternative fuzzy approach permits fluctuations well beyond the probable type of uncertainty and allows one to make fewer assumptions about the data distribution and market behavior.

Classical methods of quantitative assessment of investment risk such as CAPM (capital asset pricing model), standard deviation, the Sharpe ratio, variance-covariance, the Monte Carlo method, method of analogies, and expediency of costs are hardly compatible with the human factor, unlike the qualitative approaches, such as expert methods, ranking or pairwise comparison, which allow the unpredictability of human behavior to be taken into account.

Approach

To build a comprehensive method of estimation of the RIDPC considering the human factor, we decided to use the method of Analytic Hierarchy Process (AHP) that was initially created and developed by Thomas Saati in 1976 (see Saati 1980). The Analytic Hierarchy Process is a structured technique for dealing with complex decisions. A hierarchy is a system of ranking and organizing people, things, ideas, etc., where each element of the system, except for the top one, is subordinate to one or more other elements. Initially based on the knowledge of mathematics and psychology from the 70's and the 80's, it has been extensively studied and refined since then. In our research, we use the AHP because it helps capture both subjective and objective evaluation measures, providing a useful mechanism for checking the consistency of the evaluation measures and alternatives suggested by the team, thus reducing bias in decision-making. Moreover, the AHP provides a comprehensive and rational framework for structuring the problem, for representing and quantifying its elements, for relating those elements to overall goals, and for evaluating alternative solutions. In the field of strategic human resource management, the AHP analysis helps to determine and study different factors that influence personnel motivation and performance.

Users of the AHP first decompose their decision problem into a hierarchy of more easily comprehended subproblems, each of which can be analyzed independently. It consists of the overall goal, the group of options or alternatives for reaching the goal, and the group of factors or criteria that relate the alternatives to the goal. The criteria can be further broken down into sub-criteria, sub-sub-criteria and so on, to as many levels as the problem requires.

Once the hierarchy is built, the decision makers systematically evaluate its various elements by pairwise comparison. What is applicable to the estimation of RIDPC is that in making the comparisons, both objective data and judgments of experts may be used. The AHP converts these evaluations to numerical values that can be processed and compared. In the final step of the process, numerical priorities are calculated for each of the decision alternatives. These numbers represent the alternatives' relative ability to achieve the decision goal, so they allow a straightforward consideration of the various courses of action.

According to the AHP, it is supposed that the value function has the form:

$$v(y) = \sum_{i=1}^q w_i y_i \quad (10)$$

if $w_i = 0$, the corresponding outcome y_i can be removed from consideration. Thus, it is assumed that $w_i > 0, i = 1, q$.

The weight ratio is defined by:

$$w_{ij} = \frac{w_i}{w_j} \quad (11)$$

Human perception and judgment are subject to change when the information inputs or psychological states of the decision change. Consequently, a fixed weight vector is difficult to find. Saati proposed the following to overcome this difficulty: estimate or elicit the weight ratio w_{ij} by a_{ij} and let $A = [a_{ij}]_{q \times q}$ be the matrix of components $\{a_{ij}\}$. As each $w_{ij} > 0$ it is assumed that all $a_{ij} > 0$. Furthermore, as $w_{ij} = w_{ji}^{-1}$, Saati suggested that in practice, only $a_{ij}, j > i$ need to be assessed. Since A is founded as an approximation of W , when the consistency conditions are almost satisfied for A , one would expect that the normalized eigenvector corresponding to the maximum eigenvector of A , denoted by λ_{max} , will also be close to w .

If we have q objectives and we want to construct a scale which rates these objectives as to their importance with respect to the decision as seen by the analyst, we ask the experts to compare the objectives in paired comparisons. If we are comparing objective i to objective j , we assign the values a_{ij} and a_{ji} as follows $a_{ij} = a_{ji}^{-1}$. If objective i is more important than objective j , then a_{ij} is determined by Table 1. The scale of priorities is composed of the interval from 1 to 9 (Saati 1980).

Table 1. The fundamental scale for pairwise comparisons

Intensity of importance	Definition	Explanation
1	Equal importance	Two elements contribute equally to the objective
3	Moderate importance	Experience and judgment slightly favor one element over another
5	Strong importance	Experience and judgment strongly favor one element over another

Intensity of importance	Definition	Explanation
7	Very strong importance	One element is favored very strongly over another, its dominance is demonstrated in practice
9	Extreme importance	The evidence favoring one element over another is of the highest possible order of affirmation

Source: Saati 1980.

Aside from determining the relative weight, the overall consistency should be checked. The normalized principal eigenvector is also called the *priority vector*. Since it is normalized, the sum of all elements in the priority vector is 1. The priority vector shows relative weights among the things that we compare. To measure consistency, which is called the *Consistency Index (CI)*, as a deviation or degree of consistency, we use the following formula:

$$CI = \frac{\ddot{e}_{\max} - n}{n - 1} \quad (12)$$

Then the *Consistency Index* should be compared with the *Random Consistency Index (RI)*, which is calculated by random generation of a reciprocal matrix using the scale 1/9, 1/8, ...1/2, 1, ..., 8, 9 (similar to the bootstrap idea). The average random consistency index of a sample of 500 matrices is shown in the table below.

Table 2. Random Consistency Index *RI*

<i>n</i>	1	2	3	4	5	6	7	8	9	10
<i>RI</i>	0	0	0,58	0,9	1,12	1,24	1,32	1,41	1,45	1,49

Source: Saati 1980.

So the *Consistency Ratio (CR)*, which is calculated by the following formula, is a measure of consistency of the concrete data.

$$CR = \frac{CI}{RI} \quad (13)$$

For the consistency to be acceptable, the ratio between the *CI* and the *RI* (*Random Index*) must be less than 0,1.

Data and practical application

To gather data for our research, we conducted a survey among human resource development specialists – representatives of the HR departments of Ukrainian IT companies who played the role of experts for the AHP method. The survey

was performed in the form of a questionnaire in which experts had to compare factors of RIDPC. The questionnaire was distributed to more than 120 companies and the current number of qualitative responses comes from 32 companies. The population of the current study is distributed as following: 50% of companies had under 80 employees, 13% of companies from 80 to 200 employees, 22% of companies from 201 to 800 employees, and 15% companies with more than 800 employees.

In the framework of this research, we aim to determinate which kind of RIHPC is the most dangerous for the IT sector. To do this, we should find the weights constructing the matrices for the pairwise comparison. The results of the averaged weights of each kind of risk are presented in Table 3.

Table 3. First level of the hierarchy: weights of risks

<i>Risk</i>	<i>w</i>
Premature leaving	0,19
Ineffective training	0,26
Wrong development strategy	0,23
Risk of non-investment	0,32
CI	0,01
CR	0,02

Source: own elaboration.

According to the table, the most significant risks are the „risk of non-investment” (0,32) and „risk of ineffective training” (0,26) that are both related to the firm. Surprisingly, the „risk of premature voluntary termination” has a weight of only 0,19 points. The consistency ratio (*CR*) is 0,02, which is less than 0,1, meaning that the results are acceptable.

Table 4. Second level of the hierarchy: weights of factor related to employee

<i>Risk</i>	<i>w</i>
Motivation	0,25
Work performance	0,27
Competencies	0,25
Personal reasons	0,23
CI	0,04
CR	0,04

Source: own elaboration.

According to the analysis of risk factors related to the employee, the factors of „work performance”, „motivation”, and „competencies” have almost the same weights of importance, 0,27, 0,25 and 0,25 points respectively. The factor of „personal reasons” has a weight of 0,23 points. The results from this pairwise comparison are also acceptable in this case with the $CR = 0,04$, which is less than 0,1.

Table 5. Second level of the hierarchy: pairwise assessment of risk factors related to a company

<i>Factors</i>	<i>w</i>
Staff development system	0,08
Consistency of strategies	0,15
Salary	0,14
Corporate culture	0,09
Interesting work and projects	0,23
Team	0,18
Career opportunities	0,13
<i>CI</i>	0,14
<i>CR</i>	0,11

Source: own elaboration.

Regarding internal factors of the company, there is a high role of the factor of „interesting projects” – 0,23 points. The factors of „team”, „consistency of strategies”, „salary”, and „career opportunities” have a weight of 0,18, 0,15, 0,14, and 0,13 respectively. At the same time, the factors of „personnel development system” and „corporate culture” have relatively small weights. The consistency ratio for these factors is slightly above the boundary of acceptability (0,11).

Table 6. Second level of the hierarchy: pairwise assessment of risk factors related to external environment

<i>Risk</i>	<i>w</i>
Economic and political situation	0,18
World changes	0,08
Competitors	0,21
IT sector situation	0,21
Training providers	0,08
Technology development	0,23
<i>CI</i>	0,04
<i>CR</i>	0,03

Source: own elaboration.

Regarding the external environment, one of the most dangerous risk factors is „technology development” (0,23), while the „competitors” and „IT sector situation” factors have the same weights – 0,21 points. The factor of „economic and political situation” has a relatively high weight of 0,18 points, which is easy to explain by the influence of the severe crisis in Ukraine during 2014–2015. The results from this group pairwise comparison are also acceptable in this case, with the $CR = 0,03$, which is less than 0,1.

Conclusions

The results show that IT companies mostly invest in the development of their workers, although several choose the strategy of hiring only already qualified personnel. Moreover, according to the survey, the „risk of non-investment” has a relatively high level (0,32), which underlines the importance of wise and accurate investments in staff development.

The main advantage of the presented method is the possibility to conduct a quantitative measurement of risk. It significantly differentiates the method from other existing theoretical approaches. Furthermore, evaluating the factors that influence a risk can assist in the deep analysis of a firm’s performance in the human resource function.

The presented method allows all the main factors that affect the risk of investment in the human capital of a company to be taken into consideration. This gives a basis for further research in this field and allows for the creation of a practical framework for making decisions regarding the personnel development strategy and specific employees’ development plans for the HR departments. Moreover, the method presented in the article can be easily applied to other sectors of the economy due to its simplicity and the possibility to choose and set factors which are relevant to those sectors.

Finally, as we have collected only a relatively insignificant number of expert opinions so far, the provided results of the weight calculations should be viewed only as examples of how the method works. A further study involving large-scale data collection and analysis that will include a magnitude more Ukrainian IT companies is planned in order to achieve more statistically valid outcomes.

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Summary

In this paper, we examine key factors that influence the risks of investment in the development of human capital of a firm in the IT sector and estimate their weight in the overall risk. In particular, we single out the risk of premature voluntary termination of an employee, the risk of ineffective training, and the risk of a firm's incorrect employee development strategy. Moreover, to support management of the mentioned kinds of risks, we enumerate the factors that influence them and classify those factors into three main groups: related to the employee, related to the firm, and related to the external environment. Based on this division, we build a model for estimating the risks of investing in the development of personnel using the Analytic Hierarchy Process (AHP).

Key words: investment, staff development, analytic hierarchy process, risk assessment, risk factor

JEL: J24, C13, C83, C51

Methods of forecasting VAT revenues for the state budget of Ukraine

Oksana Okseniuk*

Introduction

Indirect taxes, especially VAT, play a key role in the formation of a consolidated budget. Its fiscal feature is characterized by the fact that VAT has a very large tax base which is less exposed to price fluctuations of raw materials and energy. This feature distinguishes VAT from other taxes and is confirmed by the stable dynamics of tax revenues to the state budget. Despite this, and regardless of the volume of revenues that are provided by VAT, the process of VAT administration is accompanied by a large number of problems and misunderstandings.

Solving the problems related to the planning and forecasting of budget revenues and expenditures is associated with the use of effective models for forecasting tax revenues. For transition countries, tax forecasting is one of the areas that is in most need of reform.

In Ukraine, the works of local scientist-economists are devoted to researching problems of the forecasting and planning of tax revenue. They are: M.Ja. Azarov, V.V. Vitlinskuj, V.P. Vishnevsky, S.V. Davydenko, A.D. Danilov, A.I. Krysovatuj, A.I. Lutsyk, Jy.V. Sybiryanska and others.

However, despite numerous studies on various aspects of the planning and forecasting of all tax systems in general, and VAT in particular, there are still a number of unanswered questions. The aim of the article is to show the use of two methods of forecasting VAT revenues to the budget, analyse their efficiency, calculate a forecast for the years 2014–2016 and to identify the key reasons of the problems of VAT forecasting.

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The methodological base for tax revenues forecasting

Tax forecasting is an assessment of tax potential and the scope of tax revenues to the budget, based on the program of socio-economic development of the state for the relevant year.

Tax forecasting is a versatile process and it should be implemented in compliance with the following provisions:

1. Forecasting should be used to solve most political problems. Tax prediction must answer a series of questions concerning more than just accounting. Such forecasting underlies the determination of the general fiscal and monetary policy, including the expected budget deficit and sources to cover it, the correlation of tax policy with the policy of social benefits, determination of the total volume of the public sector and the extent of its impact on market economic relations.
2. It is necessary to use multiple models and approaches at the same time. A large number of questions that should be answered by forecasting requires different approaches and the specifics and comparative advantages of each approach should be taken into account.
3. It should ensure the preservation of flexibility in the choice of models depending on the specific tasks of planning.
4. It should support interdepartmental cooperation. Tax planning is impossible without coordination between agencies, including such aspects as data sharing, coordination of approaches applied and the overall problem statement.

Despite the fact that the process of tax forecasting and evaluation is largely a technical challenge of rigorous economic analysis, the degree of its practical utility for the government is higher if the specificity of particular administrative issues on strategic planning is taken into account.

The methodological base for tax revenues forecasting is very broad and is constantly changing and evolving. The choice of method is influenced by the following factors:

1. the selection of tools which would be best to solve certain issues of budget planning;
2. the accuracy of the forecast (the most important component when choosing a forecasting method is to assess the reliability of indicators);
3. the purpose for which the forecast is made (in some cases there is a need to use a fiscal forecast for purposes beyond the budget planning, for example, a forecast is required for participation in international projects and organisations, or for obtaining support from international organizations and etc.);
4. the period for which the forecast or plan is made – short-term (up to 1 year), medium-term (2–5 years), long-term (over 5 years);

5. the level of accessibility and accuracy of the information used for forecasting (see Azarov et al. 2004).

One of the methodologies for calculating a theoretical VAT base was developed for Mexico using Mexican national accounts and input-output tables (see Aguirre, Shome 1988). The authors found that there was a gap in the literature concerning VAT base calculation and they tried to fill in the gap. They suggest starting with production data and modifying them through adjusting for exports, imports, capital transactions, changes in stocks, exemptions and all intermediate users to obtain taxable consumption (with the help of the input-output table). The authors came to the conclusion that this method could be applicable to other countries as well.

A VAT revenue simulation model was developed for the economy of Nepal (see Jenkins, Kuo 1995). The major purpose of this research paper was to develop an analytical framework that could be used for estimating a potential tax base and associated VAT revenues for a typical developing country. The approach is based on national accounts and input-output tables and on the equivalence of the VAT base to retail sales tax imposed on the final sales price of all goods and services.

Econometric modeling of the fiscal sector was developed for the Slovak Republic (see Olexa 1997). A conditional OLS method was used to model VAT revenues. In the linear form, VAT was modeled in the following way: $VAT = f(GDP + Imports - Exports, \text{lag of VAT}, \text{seasonal filters for the 1st and 4th quarters and dummy variables for the explanation of the extreme shifts in the development of VAT which do not correspond to the development of the exogenous variables})$ (see Legeida, Sologoub 2003).

Having reviewed the general principles of forecasting, we proceed directly to the forecasting of VAT in Ukraine.

Forecast of VAT revenues to the State budget of Ukraine

In Ukraine, VAT is the only tax forecasted by a unified officially approved method. Other taxes are also predictable but there are no unified methods at the country level. The adoption of the appropriate document in 2004 was due to the growing problems of abuses in VAT payments, sharp unpredictable negative trends in its revenues and the growing discontent of taxpayers regarding these problems.

In order to implement the Decree of the President of Ukraine of June 23, 2004 No. 671 On Urgent Measures To Improve The Efficiency Of Charging VAT, the State Tax Service of Ukraine and the Ministry of Finance, the Ministry of Economy and European Integration, the State Customs Service with the participation of the Research Financial Institute under the Ministry of Finance, the Academy of the State Border Guard Service of Ukraine, the National Institute for Strategic Studies under the Presidential Administration of Ukraine, and the Institute of Economic Forecast-

ing of the National Academy of Sciences of Ukraine developed a VAT revenues forecasting methodology (see Decree of the President of Ukraine 2004).

The joint Decree of the Ministry of Finance, the Ministry of Economy and European Integration, State Tax Administration and the State Customs Service of 31.08.04 No. 545/315/502/637 On Approval Of Methods Of VAT Forecasting, was registered with the Ministry of Justice on September 23, 2004 under No. 1202/9801 (see Decree of the Ministry of Finance et al. 2004).

The purpose of the adoption of a common forecasting method was an attempt to coordinate the positions and efforts of various departments in this process, and was the answer to increasing political and public inquiries about the information sources and accuracy of forecasts of VAT revenues to the budget.

The Ukrainian VAT forecasting model is characterized by a significant level of detailing of the tax base on components for which particular effective rates are calculated and used. The essence of the approach is to reflect accurately the VAT structure taking into account the specifics of its collection from individual elements of the tax base. That is why the forecast is calculated separately for domestic goods, imports and budgetary compensation, and then the overall forecast is calculated.

The main disadvantages of the methodology approved by the Ministry of Finance are the following:

1. The method does not take into account the effect of changes in tax rates or the tax base changing.
2. The main problem is the low level of accuracy of the potential tax base.
3. The considerable complexity of the model. In this regard, the effective rate method of forecasting is a complicated and costly process.
4. The high degree of uncertainty of the obtained forecast and significant reliance on subjective judgments (see Sidelnikova 2011).

The process of forecasting volumes of VAT revenues to the state budget of Ukraine is the most difficult of all other taxes, because this process is influenced by a large number of factors (inflation, dynamics of exports and imports, the level of protection, domestic consumption etc.).

In addition to the forecasting methodology officially adopted in Ukraine, we present several methods that can also be applied.

The methods of moving averages are based on the Weierstrass theorem, according to which any function under the most general assumptions can be locally (i.e. in a certain range of variation of argument t) represented by an algebraic polynomial of the corresponding degree.

The moving average of degree k is calculated as follows:

$$M = \frac{y_t + y_{t-1} + \dots + y_{t-k+1}}{k}$$

where k – number of members of the time series included in the moving average.

All observations are assigned equal weighting factors. Each new observation is included in the average according to its occurrence, and „the oldest” are immediately removed. The speed of response to changes in the data structure depends on the length of the smoothing interval (the number of members of the time series included in the moving average k).

If the data have a linear trend then the method of Double Moving Averages is applied. The method is that the data series is originally calculated by the moving averages method, and then the data set is averaged by the same method. The Double Moving Average is determined as:

$$M'_t = \frac{M_t + M_{t-1} + \dots + M_{t-k+1}}{k}$$

where M_t – moving average of degree t .

To calculate the forecast level, the coefficient a is used:

$$a_t = M_t + (M_t - M'_t) = 2M_t - M'_t$$

and the additional adjusting coefficient b_t (slope coefficient), which may vary for different ranges of values in the time series:

$$b_t = \frac{2}{k-1} (M_t - M'_t)$$

Thus, the predictive equation for p periods is as follows:

$$y_{t+p} = a + b_t \cdot p$$

where p – the number of periods covered by the forecast.

The forecasting of tax revenues is also carried out using correlation and regression analysis, taking into account the impact of the results of tax administration. In this case, the regression equation is as follows:

$$p = a + b \cdot VAT_k$$

where P – estimated tax revenues by type of tax,

a and b – regression coefficients,

k – forecast period,

VAT_k – forecasting of VAT in the k th forecast period.

Regression coefficients a and b are calculated by the following formulas:

$$a = TR' - b \cdot VAT'$$

$$b = \frac{\sum_{i=1}^n (VAT_i - VAT') + (TR_i - TR')}{\sum_{i=1}^n (VAT_i - VAT')^2}$$

where n – the number of values of quantities measured (number of periods),

TR' – average tax revenues by type of tax,

VAT' – average VAT (see Krusovatuj 2011).

Table 1 shows details regarding the amounts of VAT revenues to the budget of Ukraine and GDP in 2007–2013 required for the calculations of the forecast. All data was taken from official websites of the Ministry of Finance and Treasury (see Ministry of Finance 2007–2013, Treasury 2007–2013).

Table 1. Dynamics of GDP and VAT revenues to the budget of Ukraine in 2007–2013, billion UAH

	2007	2008	2009	2010	2011	2012	2013
GDP	720,7	948,1	913,3	1082,6	1302,1	1408,9	1454,9
VAT revenues	59,38	92,08	84,6	102,75	130,09	138,83	128,27

Source: the author's own elaboration.

We could analyze the effectiveness of correlation and regression analysis by forecasting VAT revenues in 2011, 2012 and 2013 and forecasting the amounts of VAT for 2014–2016. Table 2 shows the results of the calculations. Mean values of GDP in the respective years were as follows: 2007–2010 – 916,18 bln UAH, 2007–2011 – 993,36 bln UAH, 2007–2012 – 1062,62 bln UAH.

Correspondingly, the mean values of VAT revenues to the budget were as follows: 2007–2010 – 84,7 bln UAH, 2007–2011 – 93,78 bln UAH, 2007–2012 – 101,288 bln UAH.

Table 2. Calculation of forecast VAT revenues in 2011, 2012, 2013

Year	VAT' – VAT	TR' – TR	(VAT' – VAT) ²	(VAT' – VAT) (TR' – TR)
2011				
2007	–195,48	–25,32	38212,43	4949,55
2008	31,92	7,38	1018,19	235,57
2009	2,88	–0,1	8,29	–0,29
2010	166,88	18,05	27695,62	3003,88
Σ	–	–	66934,53	8188,71

Year	VAT' – VAT	TR' – TR	(VAT' – VAT) ²	(VAT' – VAT) (TR' – TR)
2012				
2007	-272,66	-34,4	74343,48	9379,5
2008	-45,26	-1,7	2048,47	76,94
2009	-80,06	-9,18	6409,6	734,95
2010	89,24	8,97	7963,78	800,48
2011	308,74	36,31	95320,39	11210,35
Σ	-	-	186085,72	22202,22
2013				
2007	-341,92	-41,91	116909,29	14329,87
2008	-114,52	-9,21	13114,83	1054,73
2009	-149,32	-16,69	22296,46	2492,15
2010	19,98	1,46	399,2	29,17
2011	239,48	28,8	57350,67	6897,02
2012	346,28	26,98	119909,84	9342,63
Σ	-	-	329980,29	34145,57

Source: the author's own elaboration.

Based on the interim results and the available formulas we obtained the following values of the basic coefficients that are shown in Table 3.

Table 3. Forecast of VAT revenues to the budget in 2011–2013

	2011	2012	2013
b	0,1223	0,1193	0,1035
a	-27,35	-24,72	-8,69
P	131,9	143,36	141,89
Deviation of forecast data from actual data	1,4%	3,2%	9,6%

Source: the author's own elaboration.

Based on these data we can conclude that the method of correlation and regression analysis provides quite a precise forecast. This method is based on the potential GDP values of the indicator but it is possible to choose another indicator. The problem in this choice is the lack of complete and accurate information.

Overall, VAT forecasting is a complex process as it is based on forecasts of GDP which are often too optimistic, leading to a high rate of errors. An example is 2013 where the error was 9,6%. This resulted from a difficult and unstable situation in the country.

To calculate forecast VAT revenues to the budget in 2014, 2015 and 2016 respectively we used the already mentioned formulas and made a forecast for each subsequent year by adding the forecast indicator of the previous year to the data. The forecast GDP under a pessimistic scenario is as follows: 2014 – 1574,3 bln UAH, 2015 – 1757,5 bln UAH, 2016 – 1963,6 bln UAH. The calculations are shown in Table 4.

Table 4. Calculation of forecast VAT revenues in 2014, 2015, 2016

Year	VAT' – VAT	TR' – TR	(VAT' – VAT) ²	(VAT' – VAT) (TR' – TR)
2014 (VAT – 1312,13 bln UAH, TR – 124,99 bln UAH)				
2010	-229,53	-22,24	52 684,02	5 104,75
2011	-10,03	5,1	100,6	-51,15
2012	96,77	13,84	9364,43	1 339,3
2013	142,77	3,28	20 383,27	468,29
Σ	-	-	82 532,32	6 897,19
2015 (VAT – 1364,56 bln UAH, TR – 129,37 bln UAH)				
2010	-281,96	-26,62	79 501,44	7,505,78
2011	-62,46	0,72	3901,25	-44,97
2012	44,34	9,46	1966,04	419,46
2013	90,34	-1,1	8161,32	-99,37
2014	209,74	17,54	43 990,87	3,678,84
Σ	-	-	137 520,92	11 459,74
2016 (VAT –1430,05 bln UAH, TR –134,83 bln UAH)				
2010	-347,45	-32,08	120 721,5	11 146,2
2011	-127,95	-4,74	16 371,2	606,48
2012	-21,15	4	4,47,32	-84,6
2013	24,85	-6,56	617,52	-163,02
2014	144,25	12,08	20 808,06	1,742,54
2015	327,45	28,27	107 223,5	9,257,01
Σ	-	-	266 189,1	22 504,61

Source: the author's own elaboration.

Based on interim data shown in Table 4 we calculated forecast VAT revenues (see Table 5).

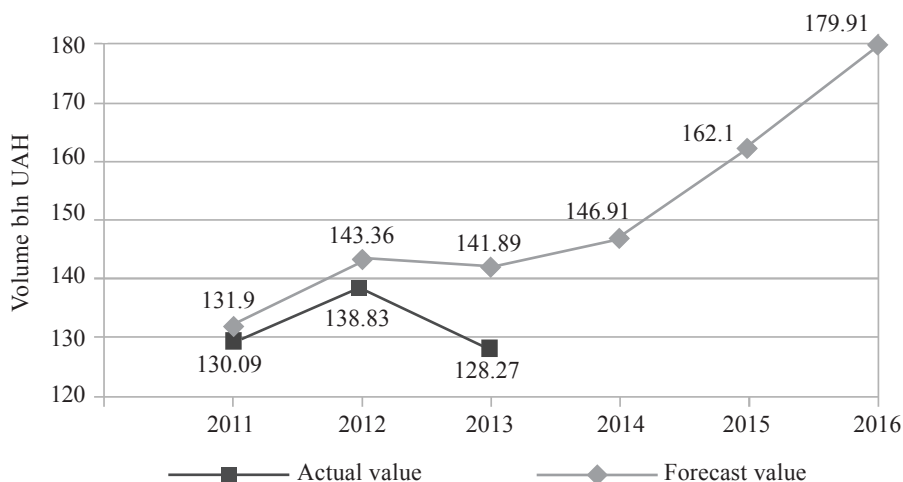
Table 5. Forecast of VAT revenues to the budget in 2014–2016

	2014	2015	2016
b	0,0836	0,0833	0,0845
a	15,3	15,7	13,99
P	146,91	162,1	179,91

Source: the author’s own elaboration.

The indicators a and b are approximately the same for all the analyzed years. There is a gradual increase in VAT revenues to the forecasted level of 179,91 bln UAH in 2016. The results of the analysis of the effectiveness of the correlation and regression method and the forecast for 2014–2016 are illustrated in Figure 1.

Figure 1. Actual VAT revenues and forecast volumes by the method of correlation and regression analysis in 2011–2016



Source: the author’s own elaboration.

We also analyzed the effectiveness of the method of the moving average and calculated the forecast. Table 6 shows VAT revenues and the results of our forecast for 2011–2013. It’s necessary to enter the data about VAT revenues for 2005 and 2006 – 33,8 bln and 50,39 bln UAH respectively, to use this method.

Table 6. Analysis of the effectiveness of the Double Moving Average method

Year	M_t	M'_t	a_t	b_t	y_{t+p} (forecast)	Error; bln UAH	Error; %
2005	–	–	–	–	–	–	–
2006	–	–	–	–	–	–	–
2007	–	–	–	–	–	–	–
2008	47,86	–	–	–	–	–	–
2009	67,28	–	–	–	–	–	–
2010	78,69	64,61	92,77	14,08	106,85	–4,1	–3,84
2011	93,14	79,7	106,58	13,44	120,02	10,07	8,39
2012	105,81	92,55	119,07	13,26	132,33	6,5	4,91
2013	119,89	106,28	133,5	13,61	147,11	–18,84	–12,81

Source: the author's own elaboration.

After the relevant calculations were made we can see that this forecasting method is less accurate than correlation and regression analysis. However, the forecasts for 2013 are characterized by a considerable error in both methods.

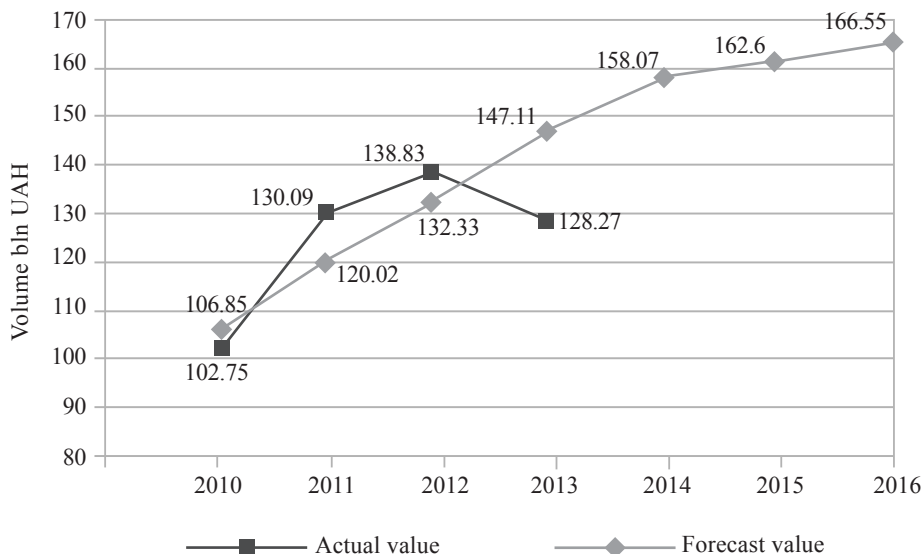
The next step is to calculate the forecast VAT revenues to the budget for 2014–2016. To calculate M_t for 2015, we introduce forecast data on revenues for 2014; and to calculate M_t for 2016, we introduce forecast data on revenues for 2015. The results are shown in Table 7. A summary of the analysis of method's efficiency and the forecast for the relevant years are shown in Figure 2.

Table 7. Forecast for 2014–2016 using dual three-term moving average

Year	M_t	M'_t	a_t	b_t	y_{t+p} (forecast)
2007	–	–	–	–	–
2008	47,86	–	–	–	–
2009	67,28	–	–	–	–
2010	78,69	64,61	92,77	14,08	106,85
2011	93,14	79,7	106,58	13,44	120,02
2012	105,81	92,55	119,07	13,26	132,33
2013	119,89	106,28	133,5	13,61	147,11
2014	132,23	119,31	145,15	12,92	158,07
2015	141,72	131,28	152,16	10,44	162,6
2016	149,65	141,2	158,1	8,45	166,55

Source: the author's own elaboration.

Figure 2. Actual VAT revenues and forecast values by the method of Double Moving Average for 2010–2016



Source: the author's own elaboration.

The forecast obtained by using the moving average method in 2014 and 2016 respectively differs from the forecast obtained by correlation and regression analysis:

1. for 2014, the difference is 11,16 bln UAH to the advantage of the moving average method;
2. for 2016, the difference is 13,36 bln UAH to the advantage of correlation and regression analysis;
3. the forecasts for 2015 coincide.

According to the State Fiscal Service of Ukraine, VAT revenue growth in 2014 was observed at 10% compared to 2013, so VAT revenues to the State budget approximate 141,9 bln USD. As you can see, warfare in Ukraine has not led to a decline in VAT revenues. Due to this, the method of correlation and regression analysis provides a more accurate prediction that differs from the actual data only by + 3,53%.

Conclusions

Experience in planning and forecasting VAT in Ukraine demonstrates the existence of a large number of risks accompanying this process. This situation leads to a significant deviation of forecast revenues from actual revenues. A partial elimination of the risks associated with planning and forecasting of budget revenues

requires approval of quantitative indicators of the maximum risk of budget planning. A legislative introduction of such indicators for tax revenues forecasting (numerical series analysis) might considerably improve budget planning.

Here are the main reasons of problems and the high level of deviations in VAT forecasting and planning. These can be divided into objective and subjective reasons. The objective reasons of the deviation of VAT revenues and refunds from the forecast ones are as follows:

1. the unstable political and economic situation;
2. extended shadow infrastructure which makes it impossible to obtain complete and accurate information – the basis for the relevant forecast;
3. the instability and low capacity of the internal market;
4. increased using of schemes of VAT evasion and illegal VAT refunds from the budget;
5. an extended list of VAT exemptions that reduces budget revenues.

The following are the subjective reasons for the low efficiency of forecasting of VAT payments and refunds:

1. neglecting the influence of inflation rates on the expected value of VAT revenues to the budget;
2. frequent changes to legislation that requires constant review of the forecasts made;
3. overvaluation of forecast indicators and too optimistic forecasts of the state of the economy;
4. imperfect methods and tools used for VAT forecasting;
5. the high degree of participation of human potential in VAT forecasting that leads to a high degree of subjectivity.

Constant analysis and monitoring are required to reduce the magnitude of error and their probability. Approaches with more detailed preparation of VAT revenues forecast should be applied in the practice of forming the indicators of revenues of the State Budget of Ukraine. Also, the information base of the forecasting does not comply with forecasting methods, namely the State Statistics Committee provides certain data with some delay.

The analysis showed that, in spite of the simplicity of the proposed approaches of forecasting VAT revenues, they observed a high degree of accuracy of forecasts. These methods can't be implemented at the state level in the way that we used in the article because they do not take into account the change in tax rates and the introduction of differentiated rates. We believe that it is necessary to take into account in formulas the effects of changing tax rates to improve the moving average method and the method of correlation and regression. Another factor that should be taken into account when calculating the forecast is the shadow economy, and the forecast should be corrected with this element.

Efficient VAT forecasting is very important at the current stage of economic development. Accurate VAT revenues forecasting will optimize fiscal policy, re-

duce the likelihood of contingencies and provide a quick and adequate response when they arise, and reduce the percentage of debt to ensure the financing of budget expenditures. The tax system reforming process which began in 2010 with the adoption of the Tax Code of Ukraine should be continued, not only to preserve the achieved level, but also to build a more effective mechanism of VAT administration which includes forecasting.

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Summary

VAT is the main indirect tax in Ukraine, among other countries, providing one of the largest items of state budget revenues. The presence of the VAT refund procedure and the need to cover public spending with the revenues from VAT administration require that an effective method of planning and forecasting VAT revenues for the new fiscal year be used.

The purpose of the article was to analyze the effectiveness of two methods of forecasting of VAT revenues, such as the moving average method and the method of correlation and regression. This was done by analysing the effectiveness of forecasts made for previous years and comparing them with actual data to make the forecast of VAT revenues using these methods for 2014–2016 years and identifying the main causes of problems in the forecasting process.

The results show that the forecasts based on two methods (correlation and regression analysis and double moving average) are sufficiently accurate. After making certain adjustments, these methods can be used at the national level.

Keywords: VAT, forecast, state budget

JEL: C53, E62, H25